



A Bacterial Community Index (BCI) for New Zealand Streams – Year 1

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Appendices

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8 Appendix

8.1 Collection of biofilm samples

Gavin Lear 20/01/2010

Stream Biofilm Sampling Protocol

1. Using a permanent marker, label each Speci-Sponge bag with the date, name of site, and consecutive numbers from 1 to 5.
(e.g., 12/01/10 Waiwera 1; 12/01/10 Waiwera 2;....., to,; 12/01/10 Waiwera 5).
2. Select *five* sampling locations, distributed across the 100 m stream reach.
Site 1 (e.g., 12/01/10 Waiwera 1) is the site located furthest downstream.
Site 2 (e.g., 12/01/10 Waiwera 5) is the site located furthest upstream.

Note. The exact position of the sampling location is not important. If possible, try to select sites that are easy for you to sample and that contain at least one suitably-sized, submerged rock (i.e., small enough to be picked up, but preferably larger than a 'clenched fist').

3. At each site, *using gloved hands*, remove one rock from the stream bed, keeping the rock upright. Rub the surface of the rock vigorously with a sterile Speci-Sponge to remove as much of the biofilm as possible. Replace the sponge back in the sample bag and seal.

Note. In most cases it will be easy to find five appropriately sized rocks. However,

- i. If only very small stones are present at a sample site, use the same sponge to sample the upper surface of a number of the small stones to provide a composite sample.
- ii. If no stones are present, look for other submerged, solid, substrates such as building debris (e.g., concrete slabs or bricks) or even glass bottles (providing they are intact, with no sharp edges) and sample them instead.
- iii. Sample submerged wood as a last resort if no other submerged substrate is available – and write the word 'wood' on the sample bag.

4. After sampling each stream, place the five sample bags into the 'chilly bin'.
5. At the end of the day, transfer all sample bags to a freezer.

Items Required for this Protocol



Five sterile
Speci-Sponges
for each stream



One permanent
marker



A pair of latex
gloves for each
stream



One 'chilly bin'

For more information regarding sample collection, or to obtain more Speci-Sponges, contact g.lear@auckland.ac.nz or gd.lewis@auckland.ac.nz

8.2 Extraction of DNA from Biofilm Biomass

DNA was extracted from biofilm samples using a modified method of Miller *et al.* (1999). Up to 0.25 g of each pelleted biofilm sample were individually resuspended in 270 μ l phosphate buffer (100 mM [pH 8.0]), 300 μ l SDS lysis buffer (100 mM NaCl; 500 mM Tris [pH 8.0]; 10% sodium dodecyl sulphate) and 300 μ l chloroform: isoamyl alcohol (24:1) within a polypropylene beadbeater vial (containing 0.5 g each of 0.1 mm and 3.0 mm silica-zirconium beads). Vials were agitated (4 ms^{-1} , 40 s) in a FastPrep machine (Bio 101, Q-BioGene, Australia), allowed to cool for 1 min and then shaken once more. Samples were centrifuged (20,000 g , 5 min) and the supernatant (~ 650 μ l) combined with 7 M NH_4OAc (360 μ l) before being mixed by hand and centrifuged (20,000 g , 5 min). The supernatant (~ 580 μ l) was combined with 0.54 volumes of isopropanol, mixed, incubated at room temperature for 15 min, and then centrifuged (20,000 g , 5 min). The DNA pellet was then washed twice with 70% ethanol and air-dried. The extracted nucleic acids were resuspended in sterile, nuclease-free water and stored at $-80\text{ }^\circ\text{C}$, until analysis.

8.3 Automated ribosomal intergenic spacer analysis of biofilm DNA

The biodiversity of bacterial communities, including unculturable components, was assessed using automated ribosomal intergenic spacer analysis (ARISA). PCR was undertaken on extracted DNA using Promega GoTaq[®] Green DNA polymerase master mix (Invitro Technologies Ltd., Auckland, New Zealand) and the universal bacterial primers SDbact (5'-TGC GGC TGG ATC CCC TCC TT-3') and LD Bact (5'-CCG GGT TTC CCC ATT CGG-3') (Ranjard, Poly *et al.* 2001), with the following amplification conditions: (i) 95 $^\circ\text{C}$ for 5 min; (ii) 30 cycles of 95 $^\circ\text{C}$ for 30 s, 61.5 $^\circ\text{C}$ for 30 s, 72 $^\circ\text{C}$ for 90 s and then (iii) 72 $^\circ\text{C}$ for 10 min. To enable analysis by ARISA (Ranjard, Poly *et al.* 2001) the primer SDBact was labeled at the 5' end with HEX (6-carboxyhexafluorescein) fluorochrome (Invitrogen Molecular Probes, Auckland, New Zealand). PCR products were purified (Zymo DNA Clean and Concentrator Kit, Ngaio Diagnostics Ltd., Nelson, New Zealand) and diluted in sterile water to a concentration of 40 $\text{ng } \mu\text{l}^{-1}$ (using a Nanodrop-8000 spectrophotometer; BioLab Ltd., Auckland, New Zealand). An aliquot of this solution was combined with 10 μ l Hi Di formamide and an internal LIZ1200 size standard (Applied Biosystems Ltd., Melbourne, Australia), before being heat treated (95 $^\circ\text{C}$, 5 min) and then cooled on ice. To generate ARISA profiles of bacterial community structure, the samples were then run on a 3130XL Capillary Genetic Analyser (Applied Biosystems Ltd.) using a 50 cm capillary and standard genemapper protocol [but with an increased run time (15 kV, 65 000 s)] to record the fluorescent intensity of different sized PCR products (approximating to the abundance of each bacterial 'taxon') within each sample.

8.4 Quantitative Methods

8.4.1 Bacterial community data

GENEMAPPER software (v. 3.7) was used to convert fluorescence data (from ARISA) into electropherograms, which enable a comparison of the proportional quantities of different-sized

DNA fragments in each sampled community. This software was also used to assign a fragment length (in nucleotide base pairs) to peaks, via comparison with the standard ladder (LIZ1200; Applied Biosystems Ltd., Melbourne, Australia). To include the maximum number of peaks while excluding background fluorescence, only peaks with a fluorescence value of 50 U or greater were subsequently analysed. As the 16S-23S region is thought to range between *c.* 140 and 1530 bp (Fisher and Triplett 1999), fragments < 150 bp were excluded from analysis. No samples contained fragments >1000 bp. The total area under the curve was normalized (to 1.0) to remove differences in profiles caused by different DNA template quantities, and peak size rounded to the nearest whole number. Each sample therefore consisted of 850 variables that represent the length (in bp) of the intergenic spacer region of constituent bacteria, thereby creating a profile of the bacterial community structure within each sample.

To visualize multivariate patterns in biofilm community structure based on the ARISA data, multidimensional scaling (MDS) was performed on the Bray-Curtis measure. MDS is a non-metric procedure that is robust to outliers and preserves the rank orders of the relative distances among points in the higher dimensional data cloud as well as possible on a smaller number of dimensions. As well as plotting the relationship between datasets using MDS, the statistical significance of differences between ARISA datasets were analysed using permutational multivariate analysis of variance (PERMANOVA; McArdle *et al.*(2001)). Statistical analyses were completed using the Primer 6 (v. 6.1.11) computer program (PRIMER-E Ltd., Plymouth, UK) with the PERMANOVA+ add-on package (Anderson, Gorley *et al.* 2008).

8.4.2 Macro invertebrate community data

Macro invertebrate taxon lists from the 2009 sampling were obtained from each regional council. Data with whole numbers for macroinvertebrates present was used as provided, without transformation, and, all samples with no numbers were replaced with 'zeroes'. For data with codes R – rare, C-common, A – abundant, VA – very abundant and VVA – very very abundant data was transformed manually with whole numbers: R was replaced with 1, C with 2, A – with 3, VA – with 4, and VVA – with 5 and then used for statistical analyses. This data was used for multi dimensional scaling using the Manhattan distance measure between samples.

8.4.3 Water quality data

Various stream parameters that provide an indication of stream health water quality data such as available nutrients (nitrate, nitrite and Kjeldahl Nitrogen, total and dissolved reactive phosphorous, dissolved and % saturated oxygen) and, turbidity, pH, and water temperature collected by the regional council, both, on the field and in the laboratory were used. Untransformed data was used, and the Manhattan distance measure of similarity was used for multi dimensional scaling analyses.

8.4.4 Development of a bacterial community indicator (BCI) based on 2009 macroinvertebrate community index (MCI) data

The initial model was created based on the 2009 MCI data which was available preliminary testing and the final model used the 2010 MCI data since it was most relevant to the time the bacterial communities were being evaluated (Feb / March 2010). Final BCI model development is described in Chapter 5 (section 5.5.3).

This section describes the methodology used with the BCI (2009 MCI data-based) model.

To enable the construction of a bacterial community index based on bacterial community data from 254 stream sites, ARISA data from a minimum of 3 samples per site was used and data from 200-900 bp was used to reduce background noise. To ensure that any significant information was not excluded, an MDS plot was generated using this trimmed data and compared with an MDS plot created with the complete dataset (150-1000 bp). The trimmed data was treated identical to the complete dataset, normalised (to 1), peak size rounded to the nearest whole number and used for statistical analyses. Bacterial community ARISA data and the observed MCI value for each stream were used to develop a predictive model to estimate the stream ecosystem health.

8.4.4.1 Method

The partial least squares regression method was used to derive the model used to predict the MCI score of streams. A random set of 526 of the 1026 streams with normalised 'X' values (base pair values from BCP data) were used to train the model. To reduce the dimensionality of the data, 7 components were selected for the final model. Finally, 'leave-one-out' cross-validation was used on the remaining 500 streams to verify the model.

8.4.4.2 Results

The final regression model for derived BCI' is

:

$$MCI \sim {}_1C_1 + {}_2C_2 + {}_3C_3 + {}_4C_4 + {}_5C_5 + {}_6C_6 + {}_7C_7,$$

Where C is the component, β the coefficient/slope of the corresponding component, and BCI' the bacterial community index times 10.

The BCI is therefore:

$$BCI = \frac{BCI'}{10}$$

The R^2 of the regression model is 1- 0.662159 (=0.3378407). This suggests that approximately 0.66 of the observed variation is explained by the above model

$$(R^2 = 1 - \frac{\sum (y_i - \hat{y})^2}{\sum (y_i - \bar{y})^2}).$$

Results suggest that approximately 66% of the observed variation is explained by the above model, and streams with lower MCI scores do not appear to be very well predicted.

8.4.4.1 Predicted BCI' vs Observed MCI values Plots

To understand how the predicted BCI' compared with the observed MCI, a plot displaying the predicted BCI' (predicted MCI in graph) and observed MCI scores of the 500 streams was generated (Fig A2).

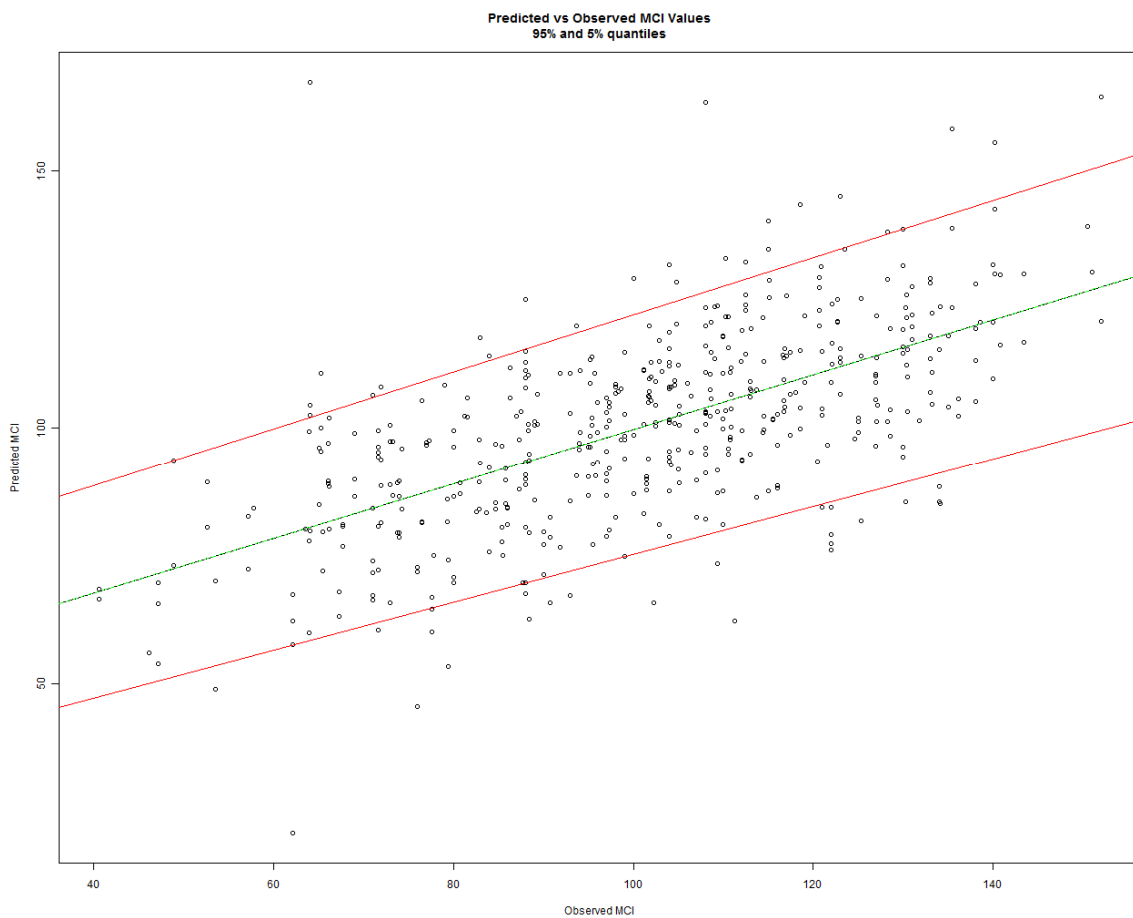


Fig A2: A plot of the bacterial community indicator (BCI) precursor BCI' (shown here as 'predicted MCI' - Y axis) in comparison to the Observed MCI (X axis) of 500 stream samples. Bacterial community data (200-900 bp, normalised) from 1026 samples was used (231 streams from 7 Regions within NZ were sampled, a minimum of 3 replicates per site was always used), a predictive model was derived from 526 random samples, and remaining 500 samples used to test the model and derive the BCI'. The output of the model is a BCI' value which is divided by 10 to derive the BCI. This plot shows that a large number of the predicted values fall within the 5th and 95th quantiles (red line). The line of best fit is given by the dashed green line. Three outliers can be seen below, two at approximately observed MCI 60 and one at approximately observed MCI 110.

It can be seen in the quantile plot that a large number of the predicted values fall within the 5th and 95th quantiles (red line). The line of best fit is given by the dashed green line. Three outliers can be seen below, two at approximately observed MCI 60 and one at approximately observed MCI 110.

8.4.4.2 Confusion Matrix

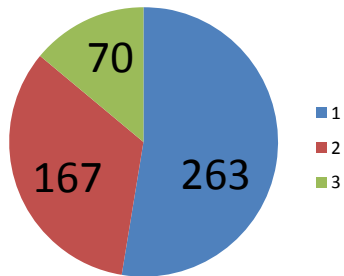
In order to understand how effectively the value predicted by the constructed model matches the observed MCI values, a confusion matrix was generated and is shown below and in Fig 63.

The matrix below shows the predicted and observed categories of the streams, where category 1 streams have an MCI score greater than or equal to 100, category 2 streams have an MCI score of [80 - 99], and category 3 streams less than or equal to 79.

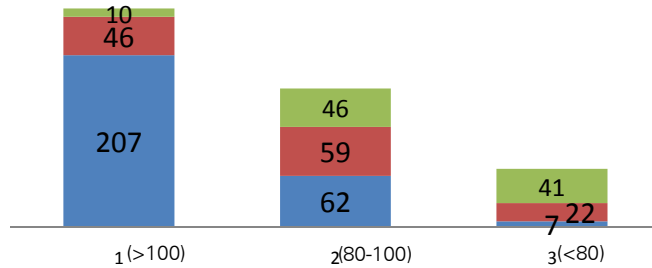
The rows of the matrix shows the predicted category of the stream using the predicted MCI score, whereas the columns show the observed categories given the original MCI scores obtained from the regional councils. For example, 207 streams were correctly predicted as category 1 streams given the fact we knew they were high quality streams (from council data).

		Observed Category			Total
		1	2	3	
Predicted Category	1	207	46	10	263
	2	62	59	46	167
	3	7	22	41	70
	Total	276	127	97	500

Predicted BCI Category



Observed MCI category as a component of predicted BCI categories n=500



Observed MCI Category

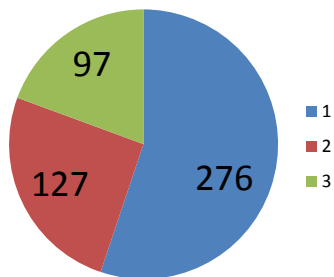


Figure A3: Predicted BCI category compared to observed MCI Category derived from the 500 values used to test the BCI Model (trained using 526 of the 1026 values). Streams were categorized as: 1 observed MCI values >100, 2 - MCI 80-100, 3 – MCI <80 respectively. Note that while the proportions of the MCI and BCI scores are similar overall there is considerable internal variation.

To derive the actual BCI from the predicted BCI' it was decided to use a value from 0 to 20 to differentiate it from the MCI and this was done as follows

$$\text{The BCI is therefore: } \text{BCI} = \frac{\text{BCI}'}{10}$$

Lower values imply communities in more impacted streams and higher values suggest communities in less impacted streams.

8.4.4.3 Bacterial Community Indicator (BCI) applied to Regional data

The BCI was calculated for each sample for all regions. The specific sample BCI and averaged Site BCI is shown in table form in Appendix 9.6. The Site BCI for each region was graphed both in alphabetical order and in order of increasing BCI. These graphs are shown below in Figure A4. Site designations are explained at the end of this figure.

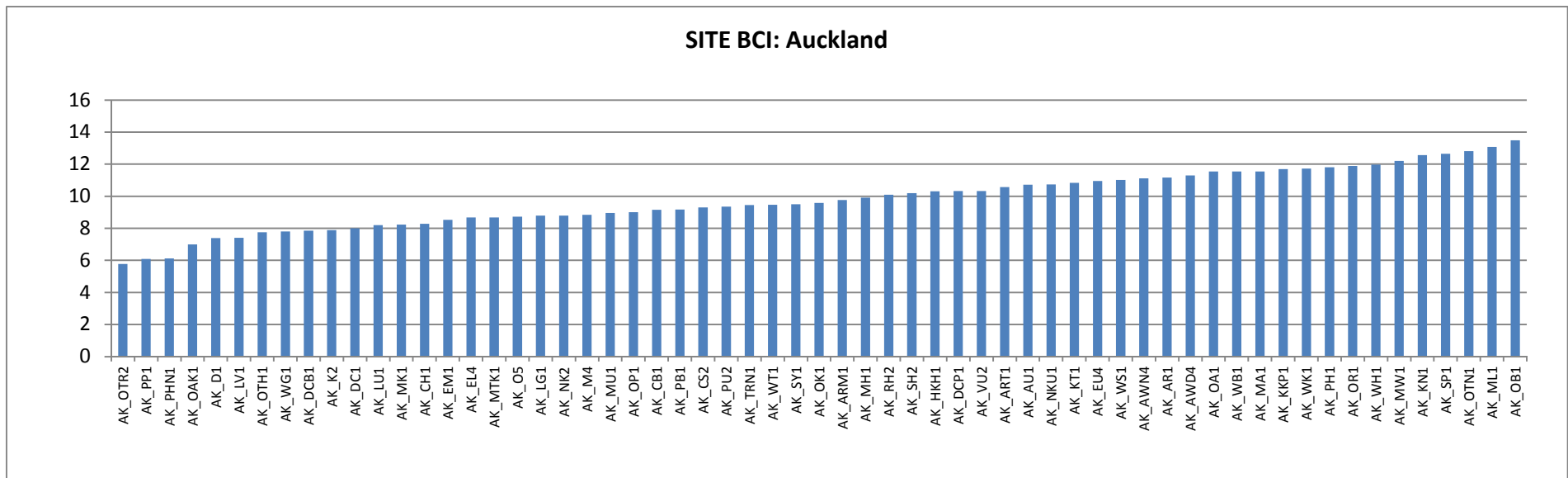
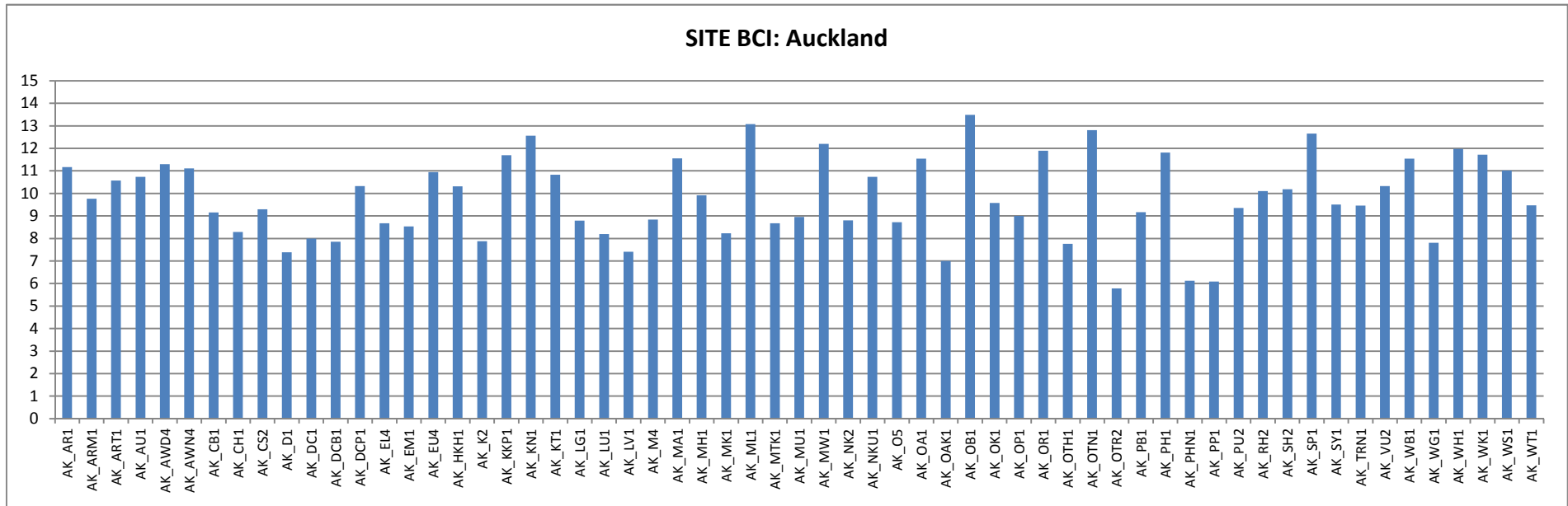


Figure A4: Calculated Bacterial Community Index for each site shown by Region. The information is presented in both alphabetical and BCI order. Site designations are explained in Appendix 8.5.1.1.

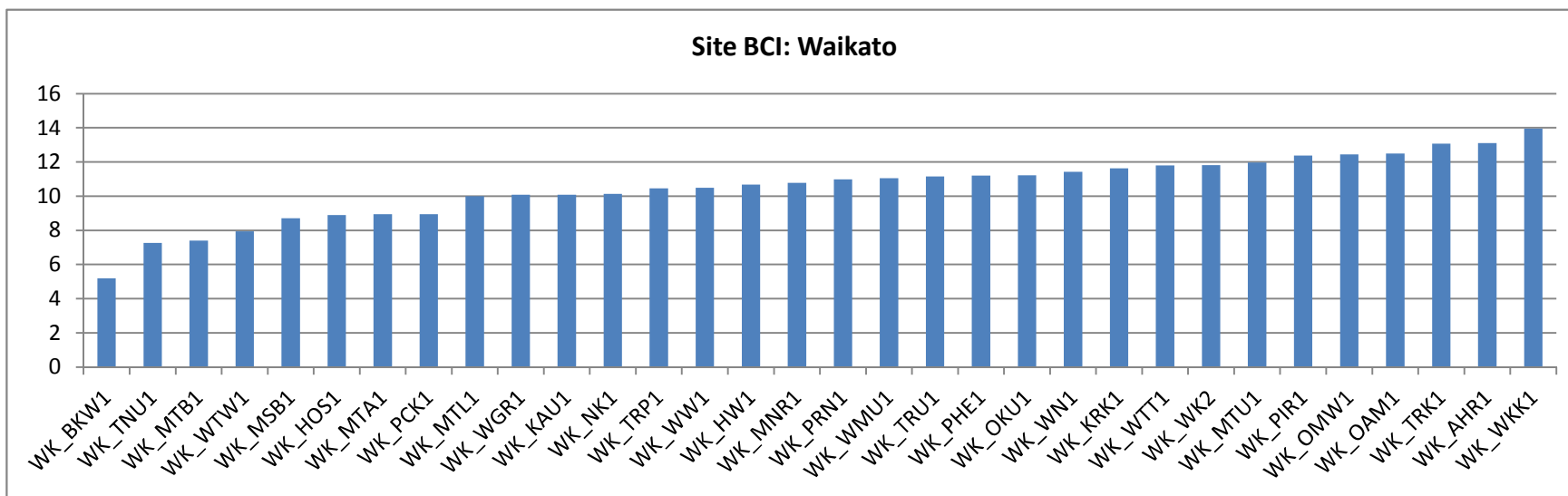
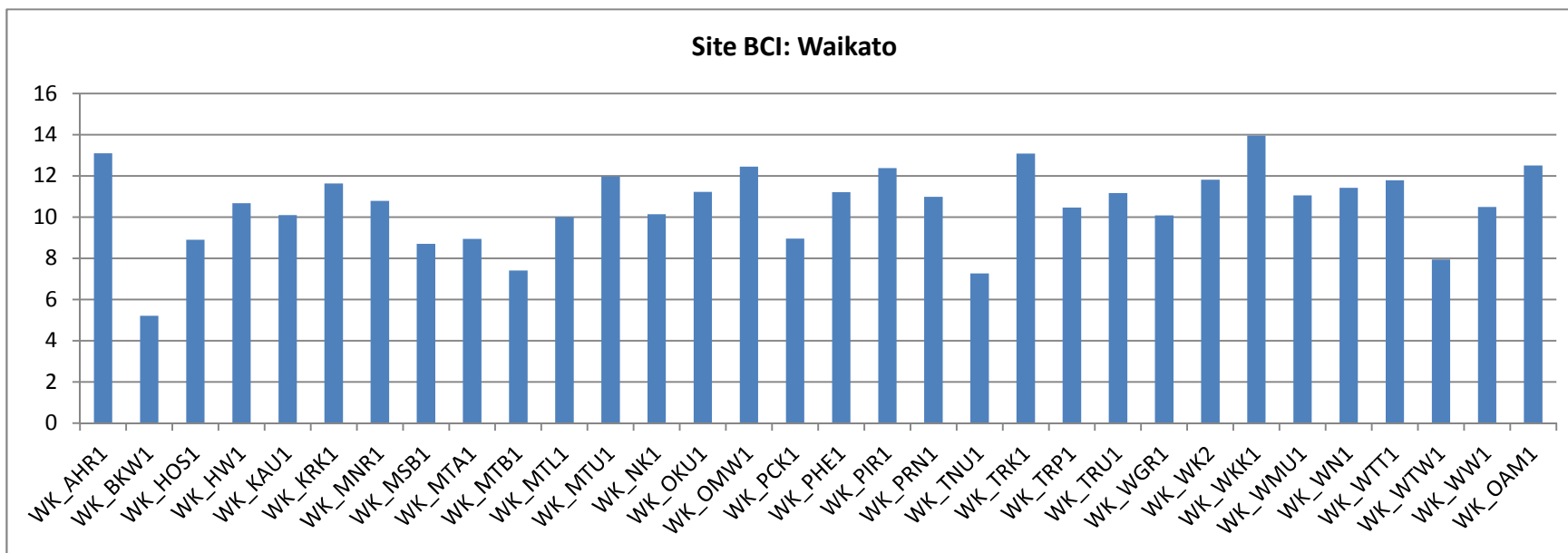


Figure A4 (continued): Calculated Bacterial Community Index for each site shown by Region. The information is presented in both alphabetical and BCI order. Site designations are explained in Appendix 8.5.2.1.

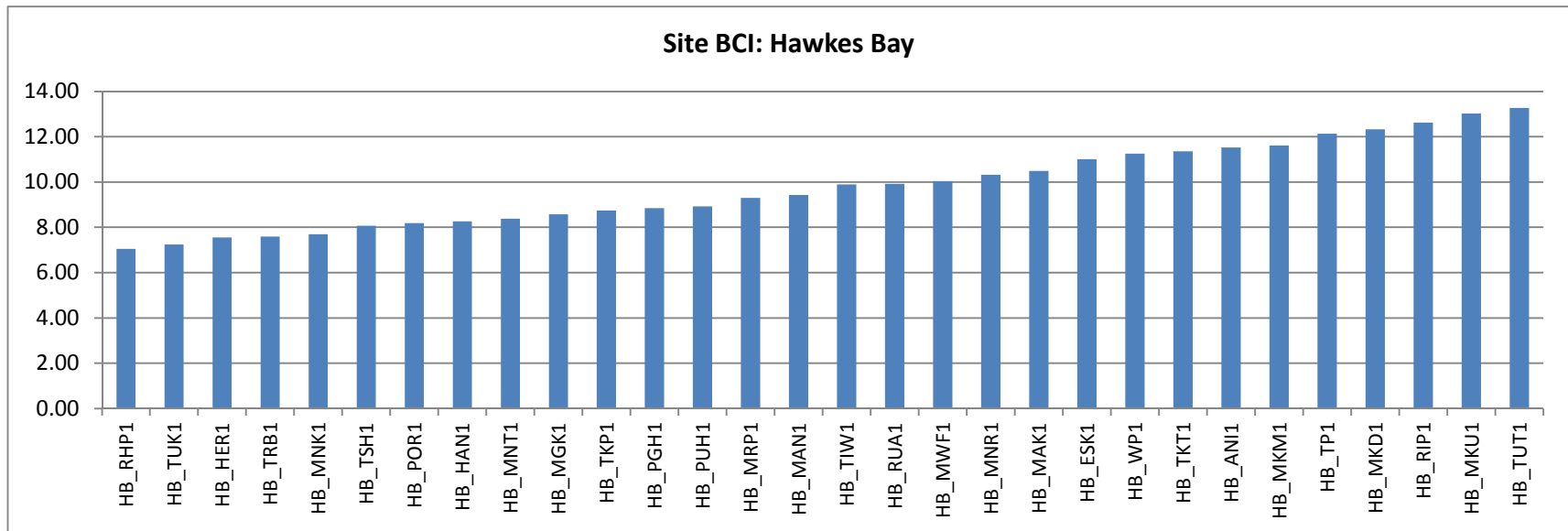
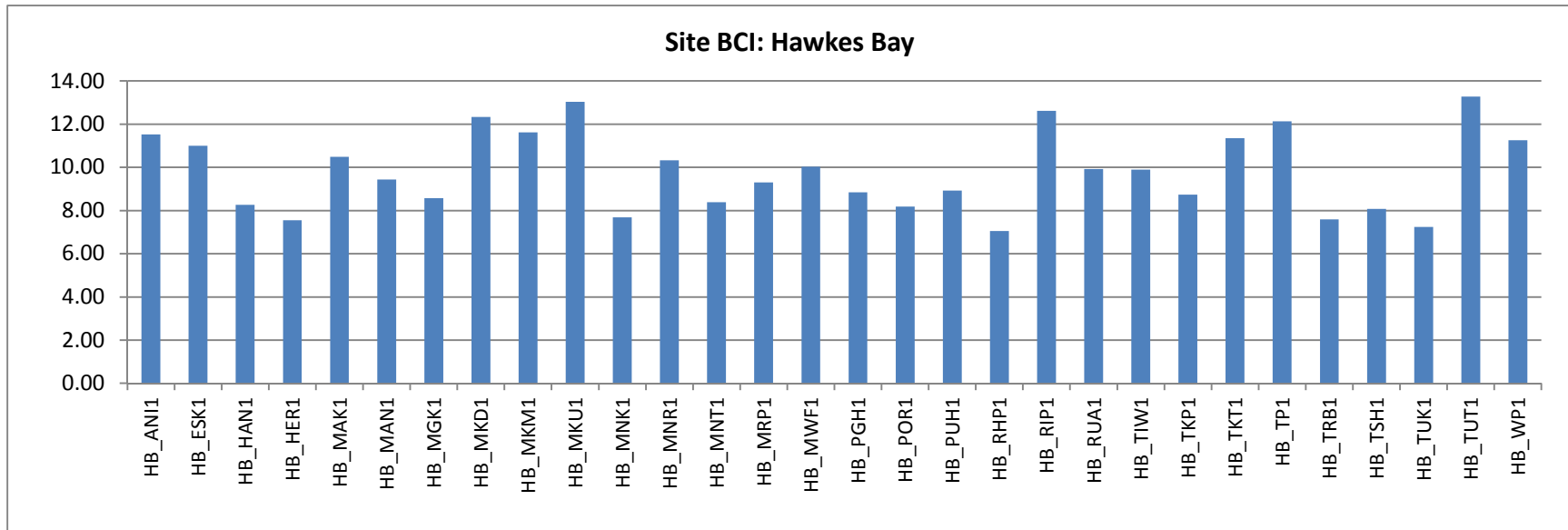


Figure A4 (continued): Calculated Bacterial Community Index for each site shown by region. The information is presented in both alphabetical and BCI order. Site designations are explained in Appendix 8.5.3.1.

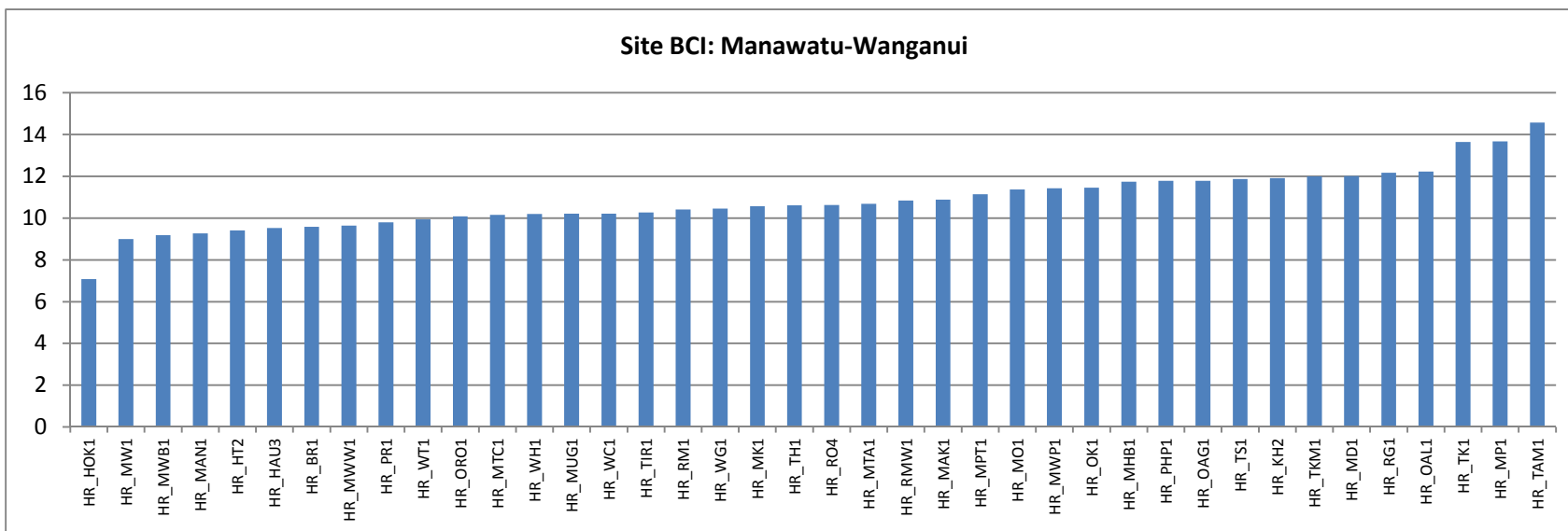
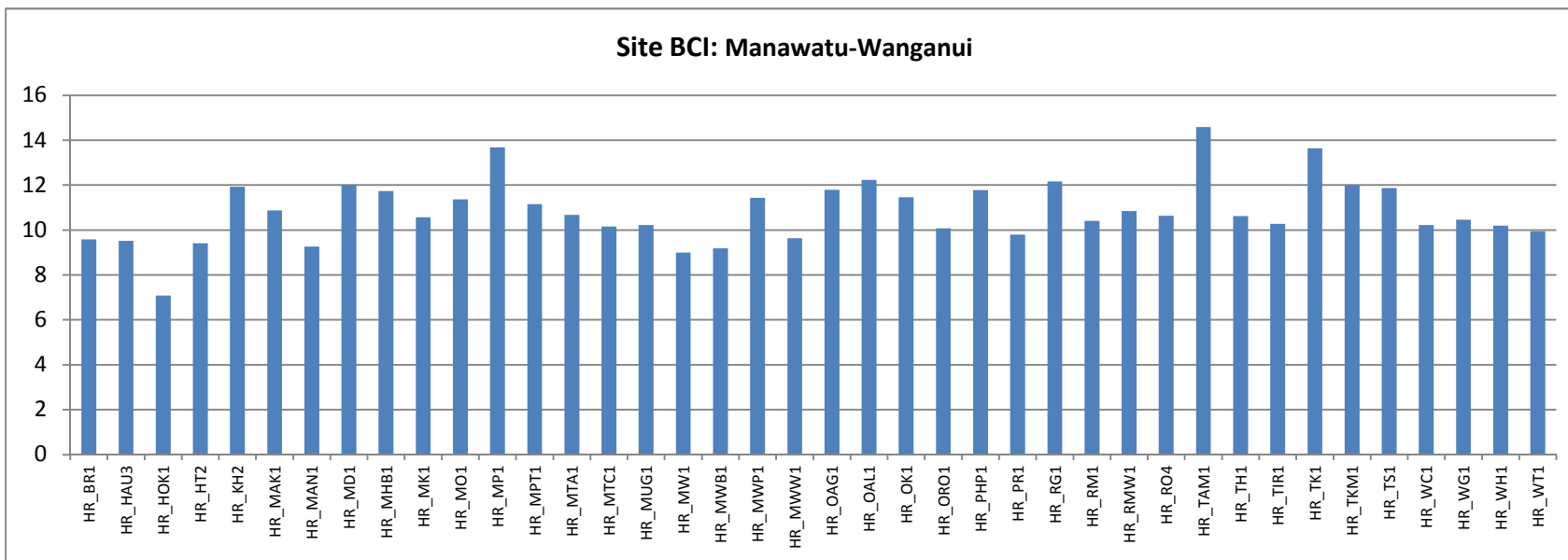


Figure A4 (continued): Calculated Bacterial Community Index for each site shown by region. The information is presented in both alphabetical and BCI order. Site designations are explained in Appendix 8.5.4.1.

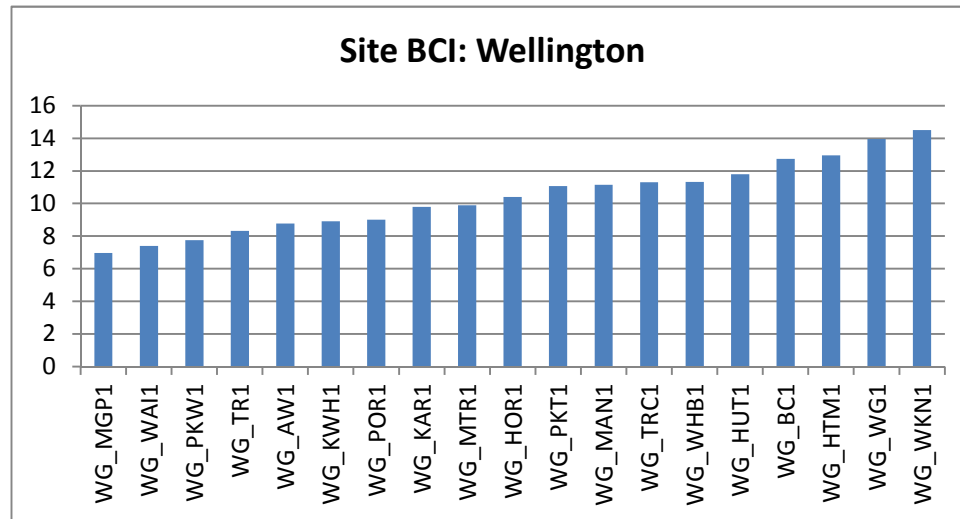
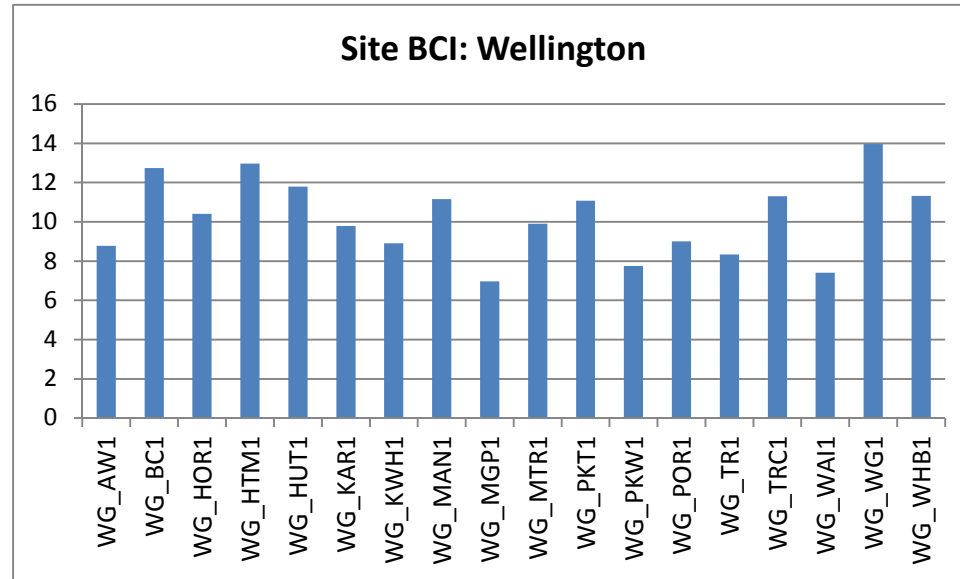


Figure A4 (continued): Calculated Bacterial Community Index for each site shown by region. The information is presented in both alphabetical and BCI order. Site designations are explained in Appendix 8.5.5.1.

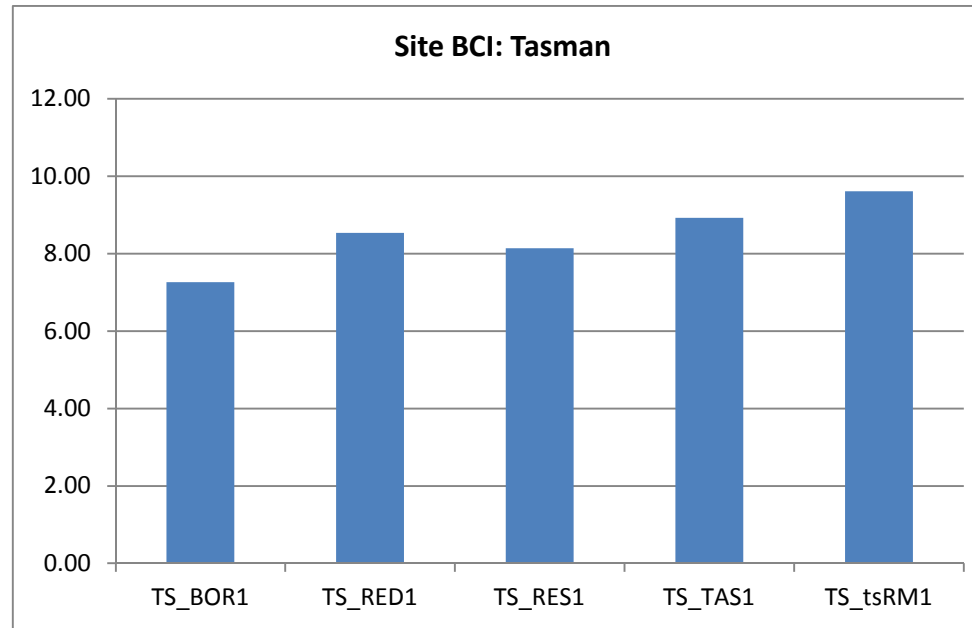


Figure A4 (continued): Calculated Bacterial Community Index for each site shown by region. The information is presented in both alphabetical and BCI order. Site designations are explained in Appendix 8.5.6.1.

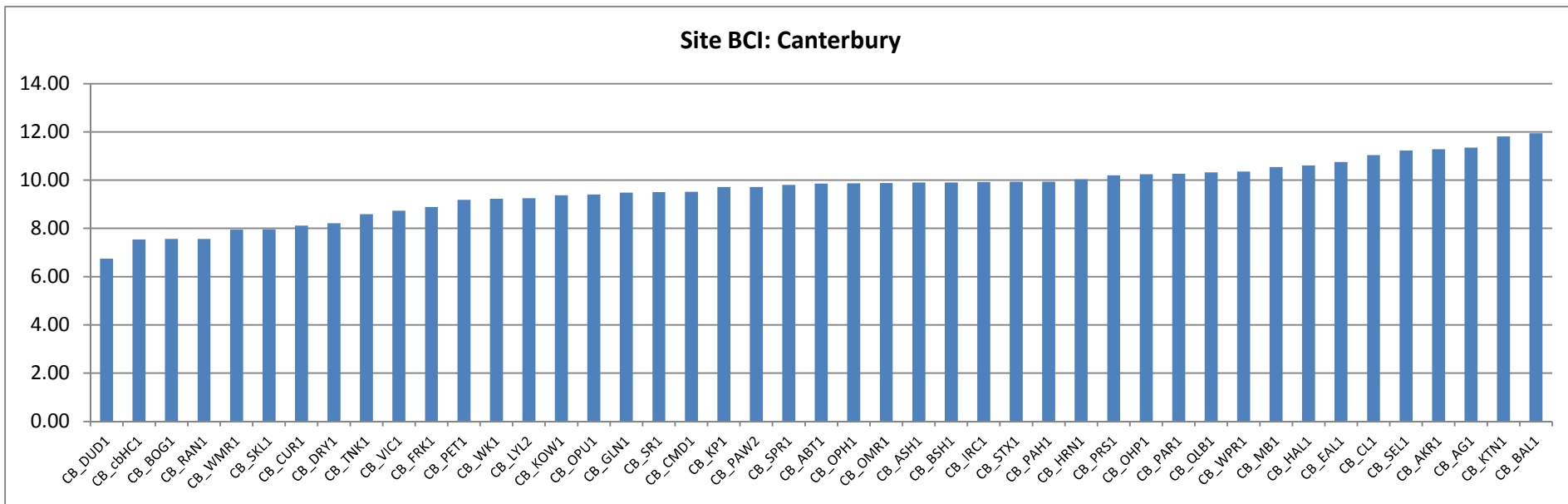
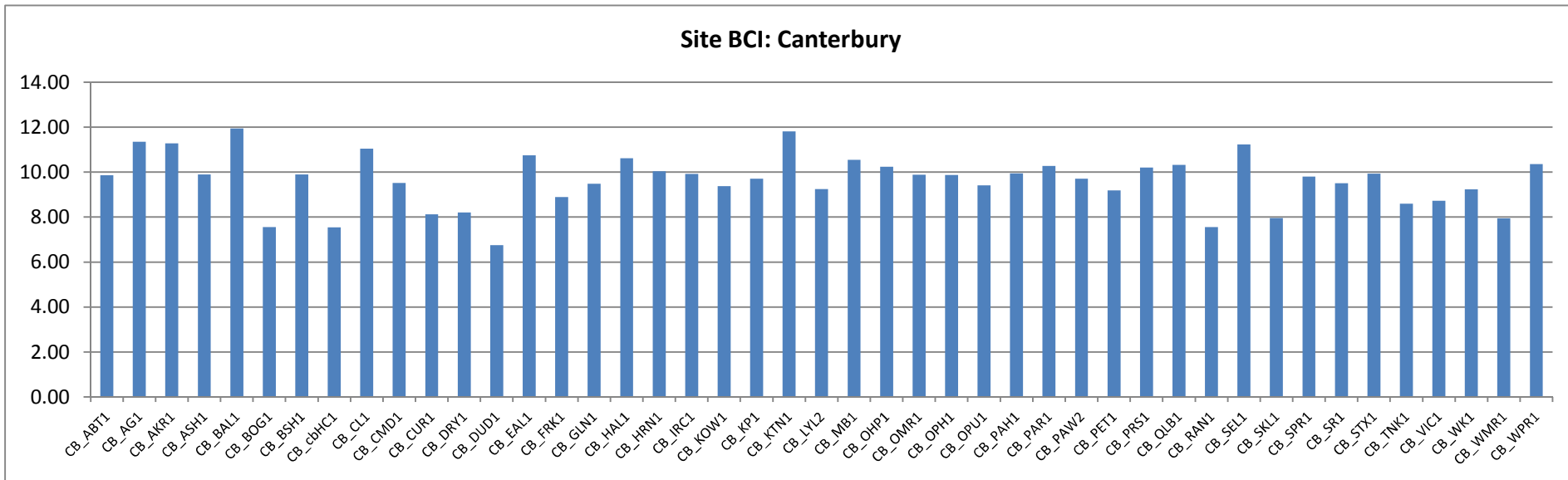


Figure A4 (continued): Calculated Bacterial Community Index for each site shown by region. The information is presented in both alphabetical and BCI order. Site designations are explained in Appendix 8.5.7.1.

8.5 Details of stream sites, landuse, macroinvertebrate and water quality data for each Regional Council

8.5.1 Auckland Regional Council

8.5.1.1 Sample storage: Stream identifier codes

Each sample received a short code label and a full stream identifier code, which started with a two-letter regional council identifier (AK – Auckland, Waikato – WK, Canterbury – CB, Hawkes Bay – HB, Wellington – WG, Horizons – HR, and, Tasman - TS). This was followed by the number 10 indicating samples were collected in the year 2010, followed by a unique one-three letter identifier, finally followed by the replicate number (1 to 5). These are as shown in Table 8.5.1.1.

Table 8.5.1.1: Samples collected from the Auckland regional council sites (67 sites, 5 replicates were used for each site). Biofilms were collected, DNA extracted and stored, and, aliquots used for amplification. Remaining DNA was archived for storage.

	STREAM	SHORT CODE LABEL	STREAM IDENTIFIER #
1	ONEPOTO	O1	AK10_OPT1
2		O2	AK10_OPT2
3		O3	AK10_OPT3
4		O4	AK10_OPT4
5		O5	AK10_OPT5
6	CHATSWOOD	CH1	AK10_CH1
7		CH2	AK10_CH2
8		CH3	AK10_CH3
9		CH4	AK10_CH4
10		CH5	AK10_CH5
11	ESKDALE MID	EM1	AK10_EM1
12		EM2	AK10_EM2
13		EM3	AK10_EM3
14		AK10_EM4	AK10_EM4
15		EM5	AK10_EM5
16	ESKDALE LOWER	EU1	AK10_EU1
17		EU2	AK10_EU2
18		EU3	AK10_EU3
19		EU4	AK10_EU4
20		EU5	AK10_EU5
21	DUDER	D1	AK10_DD1
22		D2	AK10_DD2
23		D3	AK10_DD3

24		D4	AK10_DD4
25		D5	AK10_DD5
26	MOTUTAPU	M1	AK10_MTT1
27		M2	AK10_MTT2
28		M3	AK10_MTT3
29		M4	AK10_MTT4
30		M5	AK10_MTT5
31	WAIROA TOURIST	WS1	AK10_WS1
32		WS2	AK10_WS2
33		WS3	AK10_WS3
34		WS4	AK10_WS4
35		WS5	AK10_WS5
36	WAIROA TRIBUTARY	WB1	AK10_WB1
37		WB2	AK10_WB2
38		WB3	AK10_WB3
39		WB4	AK10_WB4
40		WB5	AK10_WB5
41	PUHINUI TRIBUTARY	PB1	AK10_PB1
42		PB2	AK10_PB2
43		PB3	AK10_PB3
44		PB4	AK10_PB4
45		PB5	AK10_PB5
46	PUHINUI UPPER	PU1	AK10_PU1
47		PU2	AK10_PU2
48		PU3	AK10_PU3
49		PU4	AK10_PU4
50		PU5	AK10_PU5
51	WAITAKERE	WT1	AK10_WT1
52		WT2	AK10_WT2
53		WT3	AK10_WT3
54		WT4	AK10_WT4
55		WT5	AK10_WT5
56	CASCADES	CS1	AK10_CS1
57		CS2	AK10_CS2
58		CS3	AK10_CS3
59		CS4	AK10_CS4
60		CS5	AK10_CS5
61	MARAWHARA	MW1	AK10_MW1

62		MW2	AK10_MW2
63		MW3	AK10_MW3
64		MW4	AK10_MW4
65		MW5	AK10_MW5
66	KAURITUTAHU	KT1	AK10_KT1
67		KT2	AK10_KT2
68		KT3	AK10_KT3
69		KT4	AK10_KT4
70		KT5	AK10_KT5
71	OPANUKU	OP1	AK10_OP1
72		OP2	AK10_OP2
73		OP3	AK10_OP3
74		OP4	AK10_OP4
75		OP5	AK10_OP5
76	WAITANGI	WG1	AK10_WG1
77		WG2	AK10_WG2
78		WG3	AK10_WG3
79		WG4	AK10_WG4
80		WG5	AK10_WG5
81	WEKATOHU	WK1	AK10_WK1
82		WK2	AK10_WK2
83		WK3	AK10_WK3
84		WK4	AK10_WK4
85		WK5	AK10_WK5
86	OTARA	OTR1	AK10_OTR1
87		OTR2	AK10_OTR2
88		OTR3	AK10_OTR3
89		OTR4	AK10_OTR4
90		OTR5	AK10_OTR5
91	KUMEU	K1	AK10_KM1
92		K2	AK10_KM2
93		K3	AK10_KM3
94		K4	AK10_KM4
95		K5	AK10_KM5
96	LOWER VAUGHAN	LV1	AK10_LV1
97		LV2	AK10_LV2
98		LV3	AK10_LV3
99		LV4	AK10_LV4

100		LV5	AK10_LV5
101	PAPAKURA	PP1	AK10_PP1
102		PP2	AK10_PP2
103		PP3	AK10_PP3
104		PP4	AK10_PP4
105		PP5	AK10_PP5
106	OKURA TRIBUTARY	OK1	AK10_OK1
107		OK2	AK10_OK2
108		OK3	AK10_OK3
109		OK4	AK10_OK4
110		OK5	AK10_OK5
111	RIVERHEAD	RH1	AK10_RH1
112		RH2	AK10_RH2
113		RH3	AK10_RH3
114		RH4	AK10_RH4
115		RH5	AK10_RH5
116	SHAKESPEARE BAY	SH1	AK10_SH1
117		SH2	AK10_SH2
118		SH3	AK10_SH3
119		SH4	AK10_SH4
120		SH5	AK10_SH5
121	LUCAS	LU1	AK10_LU1
122		LU2	AK10_LU2
123		LU3	AK10_LU3
124		LU4	AK10_LU4
125		LU5	AK10_LU5
126	LIGNITE	LG1	AK10_LG1
127		LG2	AK10_LG2
128		LG3	AK10_LG3
129		LG4	AK10_LG4
130		LG5	AK10_LG5
131	OTEHA	OTH1	AK10_OTH1
132		OTH2	AK10_OTH2
133		OTH3	AK10_OTH3
134		OTH4	AK10_OTH4
135		OTH5	AK10_OTH5
136	OAKLEY	OAK1	AK10_OAK1
137		OAK2	AK10_OAK2

138		OAK3	AK10_OAK3
139		OAK4	AK10_OAK4
140		OAK5	AK10_OAK5
141	CAMPBELL'S BAY	CB1	AK10_CB1
142		CB2	AK10_CB2
143		CB3	AK10_CB3
144		CB4	AK10_CB4
145		CB5	AK10_CB5
146	VAUGHAN UPPER	VU1	AK10_VU1
147		VU2	AK10_VU2
148		VU3	AK10_VU3
149		VU4	AK10_VU4
150		VU5	AK10_VU5
151	ESKDALE UPPER	EU1	AK10_EU1
152		EU2	AK10_EU2
153		EU3	AK10_EU3
154		EU4	AK10_EU4
155		EU5	AK10_EU5
156	PUHOI	PH1	AK10_PH1
157		PH2	AK10_PH2
158		PH3	AK10_PH3
159		PH4	AK10_PH4
160		PH5	AK10_PH5
161	ORERE A	OA1	AK10_OA1
162		OA2	AK10_OA2
163		OA3	AK10_OA3
164		OA4	AK10_OA4
165		OA5	AK10_OA5
166	ORERE B	OB1	AK10_OB1
167		OB2	AK10_OB2
168		OB3	AK10_OB3
169		OB4	AK10_OB4
170		OB5	AK10_OB5
171	KAUKAPAKAPA	KKP1	AK10_KKP1
172		KKP2	AK10_KKP2
173		KKP3	AK10_KKP3
174		KKP4	AK10_KKP4
175		KKP5	AK10_KKP5

176	ARARIMU	ARM1	AK10_ARM1
177		ARM2	AK10_ARM2
178		ARM3	AK10_ARM3
179		ARM4	AK10_ARM4
180		ARM5	AK10_ARM5
181	MAHURANGI	MH1	AK10_MH1
182		MH2	AK10_MH2
183		MH3	AK10_MH3
184		MH4	AK10_MH4
185		MH5	AK10_MH5
186	NUKUMEA UPPER	NKU1	AK10_NKU1
187		NKU2	AK10_NKU2
188		NKU3	AK10_NKU3
189		NKU4	AK10_NKU4
190		NKU5	AK10_NKU5
191	AWARERE DIBBLE	AWD1	AK10_AWD1
192		AWD2	AK10_AWD2
193		AWD3	AK10_AWD3
194		AWD4	AK10_AWD4
195		AWD5	AK10_AWD5
196	HOKO KRAAK HILL	HKH1	AK10_HKH1
197		HKH2	AK10_HKH2
198		HKH3	AK10_HKH3
199		HKH4	AK10_HKH4
200		HKH5	AK10_HKH5
201	MAKARAU	MK1	AK10_MK1
202		MK2	AK10_MK2
203		MK3	AK10_MK3
204		MK4	AK10_MK4
205		MK5	AK10_MK5
206	WEST HOE	WH1	AK10_WH1
207		WH2	AK10_WH2
208		WH3	AK10_WH3
209		WH4	AK10_WH4
210		WH5	AK10_WH5
211	MT AUCKLAND	MA1	AK10_MA1
212		MA2	AK10_MA2
213		MA3	AK10_MA3

214		MA4	AK10_MA4
215		MA5	AK10_MA5
216	OTANERUA	OTN1	AK10_OTN1
217		OTN2	AK10_OTN2
218		OTN3	AK10_OTN3
219		OTN4	AK10_OTN4
220		OTN5	AK10_OTN5
221	KONINI	KN1	AK10_KN1
222		KN2	AK10_KN2
223		KN3	AK10_KN3
224		KN4	AK10_KN4
225		KN5	AK10_KN5
226	MILNE	ML1	AK10_ML1
227		ML2	AK10_ML2
228		ML3	AK10_ML3
229		ML4	AK10_ML4
230		ML5	AK10_ML5
231	HUNUA at ST PAUL'S	SP1	AK10_SP1
232		SP2	AK10_SP2
233		SP3	AK10_SP3
234		SP4	AK10_SP4
235		SP5	AK10_SP5
236	AWANOHI MID	AWN1	AK10_AWN1
237		AWN2	AK10_AWN2
238		AWN3	AK10_AWN3
239		AWN4	AK10_AWN4
240		AWN5	AK10_AWN5
241	OKURA at AWANOHI	OAW1	AK10_OAW1
242		OAW2	AK10_OAW2
243		OAW3	AK10_OAW3
244		OAW4	AK10_OAW4
245		OAW5	AK10_OAW5
246	MANGATAWHIRI	MTW1	AK10_MTW1
247		MTW2	AK10_MTW2
248		MTW3	AK10_MTW3
249		MTW4	AK10_MTW4
250		MTW5	AK10_MTW5
251	AWANOHI RURAL	ART1	AK10_ART1

	TRIB		
252		ART2	AK10_ART2
253		ART3	AK10_ART3
254		ART4	AK10_ART4
255		ART5	AK10_ART5
256	DYERS CREEK PADDOCK	DCP1	AK10_DCP1
257		DCP2	AK10_DCP2
258		DCP3	AK10_DCP3
259		DCP4	AK10_DCP4
260		DCP5	AK10_DCP5
261	OKURA TRIBUTARY II	OT1	AK10_OT1
262		OT2	AK10_OT2
263		OT3	AK10_OT3
264		OT4	AK10_OT4
265		OT5	AK10_OT5
266	AROARA	AR1	AK10_AR1
267		AR2	AK10_AR2
268		AR3	AK10_AR3
269		AR4	AK10_AR4
270		AR5	AK10_AR5
271	MATAKANA LTB	MTK1	AK10_MTK1
272		MTK2	AK10_MTK2
273		MTK3	AK10_MTK3
274		MTK4	AK10_MTK4
275		MTK5	AK10_MTK5
276	DYERS CREEK BUSH	DCB1	AK10_DCB1
277		DCB2	AK10_DCB2
278		DCB3	AK10_DCB3
279		DCB4	AK10_DCB4
280		DCB5	AK10_DCB5
281	TAWHARANUI	TRN1	AK10_TRN1
282		TRN2	AK10_TRN2
283		TRN3	AK10_TRN3
284		TRN4	AK10_TRN4
285		TRN5	AK10_TRN5
286	OKURA RESERVE	OR1	AK10_OR1
287		OR2	AK10_OR2

288		OR3	AK10_OR3
289		OR4	AK10_OR4
290		OR5	AK10_OR5
291	PUHUNUI LTB	PHN1	AK10_PHN1
292		PHN2	AK10_PHN2
293		PHN3	AK10_PHN3
294		PHN4	AK10_PHN4
295		PHN5	AK10_PHN5
296	AWANOHI	AW1	AK10_AW1
297		AW2	AK10_AW2
298		AW3	AK10_AW3
301	NGAKAROA	NK1	AK10_NK1
302		NK2	AK10_NK2
303		NK3	AK10_NK3
304		NK4	AK10_NK4
305		NK5	AK10_NK5
306	WAIWHUI FIRTH	WF1	AK10_WF1
307		WF2	AK10_WF2
308		WF3	AK10_WF3
309		WF4	AK10_WF4
310		WF5	AK10_WF5
311	SYMONDS	SY1	AK10_SY1
312		SY2	AK10_SY2
313		SY3	AK10_SY3
314		SY4	AK10_SY4
315		SY5	AK10_SY5
316	MAUKU	MU1	AK10_MU1
317		MU2	AK10_MU2
318		MU3	AK10_MU3
319		MU4	AK10_MU4
320		MU5	AK10_MU5
321	AWANOHI UPPER	AU1	AK10_AU1
322		AU2	AK10_AU2
323		AU3	AK10_AU3
324		AU4	AK10_AU4
325		AU5	AK10_AU5
326	DUCK CREEK	DC1	AK10_DC1
327		DC2	AK10_DC2

328		DC3	AK10_DC3
329		DC4	AK10_DC4
330		DC5	AK10_DC5
331	MAHURANGI	MR1	AK10_MR1
332		MR2	AK10_MR2
333		MR3	AK10_MR3
334		MR4	AK10_MR4
335		MR5	AK10_MR5

8.5.1.2 Catchment land-use data

Catchment land-use data of areas upstream of the stream sites was obtained from the Auckland Regional Council database and (these are shown in Table 8.4.1.2). This was used to evaluate any correlation between bacterial community data and land-use trends since the environment and changes that occur therein are expected to modify the bacterial communities.

Table 8.4.1.2: Catchment-land-use data in terms of total land area assessed and as a percentage of a total.

SITE NAME	STREAM NAME	Land use	Exotic Veg	Hort	Native Veg	Other	Pastoral	Urban	Total (ha)	Exotic Veg %	Hort %	Native Veg %	Other %	Pastoral %	Urban %	Total (%)
FWM080	Ararimu	Rural	3265.9	120.1	568.1	14.2	3103.3	3.3	7074.9	46.2	1.7	8.0	0.2	43.9	0.0	100.0
FWM068	Aroara	Rural	39.9	0.0	442.4	0.0	355.6	0.0	837.9	4.8	0.0	52.8	0.0	42.4	0.0	100.0
FWM060	Awanohi (mid)	Rural	27.3	0.0	144.9	0.0	62.2	0.4	234.7	11.6	0.0	61.7	0.0	26.5	0.2	100.0
FWM059	Awanohi (trib)	Rural	16.9	0.0	4.6	0.0	27.6	0.0	49.1	34.4	0.0	9.4	0.0	56.2	0.0	100.0
FWM057	Awanohi (upper 1)	Rural	9.8	0.0	72.2	0.0	19.6	0.4	101.9	9.6	0.0	70.8	0.0	19.2	0.4	100.0
FWM058	Awanohi (upper 2)	Rural	10.4	0.0	138.5	0.0	33.9	0.4	183.2	5.7	0.0	75.6	0.0	18.5	0.2	100.0
FWM004	Awarere (Dibble)	Exotic forest	43.8	0.0	0.0	0.0	0.0	0.0	43.8	100.0	0.0	0.0	0.0	0.0	0.0	100.0
FWM064	Campbells Bay	Urban	1.1	0.0	20.9	0.0	0.0	25.1	47.1	2.3	0.0	44.4	0.0	0.0	53.3	100.0
FWM048	Cascade LTB	Native forest	0.0	0.0	1367.4	22.8	0.0	0.1	1390.3	0.0	0.0	98.4	1.6	0.0	0.0	100.0
FWM016	Chatswood	Urban	0.0	0.0	9.6	0.0	0.0	28.3	37.9	0.0	0.0	25.2	0.0	0.0	74.8	100.0
FWM076	Duck Creek	Rural	2.4	1.6	0.1	0.0	27.4	0.0	31.5	7.6	5.0	0.4	0.0	87.1	0.0	100.0
FWM069	Duder	Rural	0.0	0.0	2.2	0.0	16.9	0.0	19.1	0.0	0.0	11.6	0.0	88.4	0.0	100.0
FWM087	Dyers Creek (bush)	Rural	42.2	0.0	260.8	0.0	347.7	0.0	650.8	6.5	0.0	40.1	0.0	53.4	0.0	100.0
FWM088	Dyers Creek (paddock)	Rural	42.2	0.0	233.9	0.0	327.4	0.0	603.5	7.0	0.0	38.7	0.0	54.3	0.0	100.0
FWM071	Eskdale (lower)	Urban	0.0	0.0	132.3	0.0	13.3	236.8	382.4	0.0	0.0	34.6	0.0	3.5	61.9	100.0
FWM072	Eskdale (mid)	Urban	0.0	0.0	54.3	0.0	13.3	41.3	108.9	0.0	0.0	49.9	0.0	12.2	37.9	100.0

FWM073	Eskdale (upper)	Urban	0.0	0.0	34.9	0.0	13.3	0.0	48.2	0.0	0.0	72.4	0.0	27.6	0.0	100.0
FWM022	Hoteo (Kraak Hill)	Exotic forest	71.1	0.0	0.0	0.0	2.1	0.0	73.2	97.2	0.0	0.0	0.0	2.8	0.0	100.0
FWM086	Kaukapakapa	Native forest	0.0	0.0	47.5	0.0	0.1	0.0	47.6	0.0	0.0	99.7	0.0	0.3	0.0	100.0
FWM065	Kauritutahi	Native forest	0.4	0.0	45.5	0.0	6.2	0.0	52.1	0.8	0.0	87.3	0.0	11.9	0.0	100.0
FWM044	Konini	Native forest	0.0	0.0	1948.9	5.7	0.0	0.0	1954.6	0.0	0.0	99.7	0.3	0.0	0.0	100.0
FWM021	Kumeu LTB	Rural	185.0	214.4	560.3	3.6	3517.7	86.6	4567.5	4.0	4.7	12.3	0.1	77.0	1.9	100.0
FWM070	Lignite	Urban	0.0	0.0	27.3	0.0	0.3	56.9	84.5	0.0	0.0	32.3	0.0	0.4	67.3	100.0
FWM040	Lucas LTB	Urban	53.2	0.0	50.9	8.1	242.2	193.6	547.9	9.7	0.0	9.3	1.5	44.2	35.3	100.0
FWM089	Mahurangi (Trappitt)	Native forest	3.1	0.0	46.3	0.0	0.6	0.0	50.0	6.1	0.0	92.8	0.0	1.1	0.0	100.0
FWM028	Mahurangi LTB	Exotic forest	456.4	0.0	4.0	0.0	0.2	0.0	460.6	99.1	0.0	0.9	0.0	0.0	0.0	100.0
FWM091	Makarau River	Rural	74.2	0.0	439.3	10.5	1613.0	0.0	2137.1	3.5	0.0	20.6	0.5	75.5	0.0	100.0
FWM045	Mangatawhiri	Native forest	0.0	0.0	489.0	0.0	0.0	0.0	489.0	0.0	0.0	100.0	0.0	0.0	0.0	100.0
FWM049	Marawhara	Native forest	0.0	0.0	292.8	0.0	1.6	0.0	294.4	0.0	0.0	99.4	0.0	0.6	0.0	100.0
FWM031	Matakana LTB	Rural	254.1	1.7	550.1	0.0	532.3	2.1	1340.3	19.0	0.1	41.0	0.0	39.7	0.2	100.0
FWM074	Mauku Stream (STP)	Rural	7.0	659.8	64.4	0.0	1159.2	4.0	1894.3	0.4	34.8	3.4	0.0	61.2	0.2	100.0
FWM043	Milne	Native forest	0.0	0.0	264.0	0.0	0.0	0.0	264.0	0.0	0.0	100.0	0.0	0.0	0.0	100.0

FWM084	Motutapu	Rural	13.6	0.0	8.7	0.0	155.1	0.0	177.3	7.6	0.0	4.9	0.0	87.5	0.0	100.0
FWM056	Mt Auckland	Native forest	0.0	0.0	72.1	0.0	0.0	0.0	72.1	0.0	0.0	100.0	0.0	0.0	0.0	100.0
FWM037	Ngakaroa LTB	Rural	16.5	92.9	6.1	0.0	332.6	0.0	448.1	3.7	20.7	1.4	0.0	74.2	0.0	100.0
FWM047	Nukumea	Native forest	0.0	0.0	99.7	0.0	0.9	0.0	100.7	0.0	0.0	99.1	0.0	0.9	0.0	100.0
FWM035	Oakley LTB	Urban	0.8	0.0	24.9	0.0	0.0	1198.3	1224.0	0.1	0.0	2.0	0.0	0.0	97.9	100.0
FWM075	Okura (reserve)	Native forest	0.5	0.0	26.8	0.0	0.0	0.0	27.3	1.9	0.0	98.1	0.0	0.0	0.0	100.0
FWM062	Okura (trib 1)	Rural	7.7	0.0	8.3	0.0	36.0	0.0	52.0	14.8	0.0	16.0	0.0	69.2	0.0	100.0
FWM063	Okura (trib 2)	Rural	30.0	0.0	43.3	0.0	53.5	0.3	127.1	23.6	0.0	34.1	0.0	42.1	0.2	100.0
FWM061	Okura Stream (Awanohi Rd)	Rural	53.6	0.0	299.8	0.3	197.5	0.4	551.6	9.7	0.0	54.3	0.0	35.8	0.1	100.0
FWM009	Onepoto	Urban	0.0	0.0	24.3	0.0	0.0	55.3	79.5	0.0	0.0	30.5	0.0	0.0	69.5	100.0
FWM034	Opanuku LTB	Rural	3.0	15.3	1289.3	0.0	244.6	15.7	1567.9	0.2	1.0	82.2	0.0	15.6	1.0	100.0
FWM020	Orere A	Exotic forest	67.0	0.0	4.3	0.0	0.0	0.0	71.3	93.9	0.0	6.1	0.0	0.0	0.0	100.0
FWM019	Orere B	Exotic forest	81.3	0.0	47.4	0.0	0.0	0.0	128.6	63.2	0.0	36.8	0.0	0.0	0.0	100.0
FWM052	Otanerua	Native forest	0.0	0.0	46.2	0.0	0.9	0.0	47.2	0.0	0.0	98.1	0.0	1.9	0.0	100.0
FWM038	Otara (Kennel Hill) LTB	Urban	30.7	6.6	104.7	1.7	1533.2	153.7	1830.6	1.7	0.4	5.7	0.1	83.8	8.4	100.0
FWM013	Oteha LTB	Urban	37.8	0.0	60.2	77.4	139.7	657.8	972.9	3.9	0.0	6.2	8.0	14.4	67.6	100.0
FWM033	Papakura LTB	Rural	356.6	89.4	367.9	10.0	3723.5	204.2	4751.7	7.5	1.9	7.7	0.2	78.4	4.3	100.0

FWM011	Puhinui (trib)	Urban	8.3	0.0	31.6	0.0	113.2	46.6	199.7	4.1	0.0	15.8	0.0	56.7	23.4	100.0
FWM015	Puhinui (upper)	Rural	4.4	0.0	7.9	0.0	125.4	1.6	139.3	3.2	0.0	5.6	0.0	90.0	1.1	100.0
FWM039	Puhinui LTB	Urban	16.9	0.0	103.1	1.1	471.8	449.8	1042.7	1.6	0.0	9.9	0.1	45.2	43.1	100.0
FWM012	Puhoi	Native forest	0.0	0.0	21.3	0.0	1.8	0.0	23.1	0.0	0.0	92.2	0.0	7.8	0.0	100.0
FWM008	Riverhead	Exotic forest	400.0	0.0	1.2	8.5	3.4	0.0	413.1	96.8	0.0	0.3	2.0	0.8	0.0	100.0
FWM051	Shakespeare	Rural	0.0	0.0	12.6	0.0	14.4	0.0	27.0	0.0	0.0	46.6	0.0	53.4	0.0	100.0
FWM018	St Pauls	Exotic forest	230.6	0.0	44.4	0.0	0.0	0.0	275.0	83.9	0.0	16.1	0.0	0.0	0.0	100.0
FWM024	Symonds	Rural	12.4	1.1	374.8	0.0	279.6	0.0	667.9	1.9	0.2	56.1	0.0	41.9	0.0	100.0
FWM090	Tawharanui	Native forest	0.0	0.0	14.4	0.0	1.5	0.0	15.9	0.0	0.0	90.6	0.0	9.4	0.0	100.0
FWM014	Vaughan (upper)	Rural	17.5	0.0	35.1	0.0	44.7	6.9	104.1	16.8	0.0	33.7	0.0	42.9	6.6	100.0
FWM041	Vaughans Stream (Lower Weir)	Rural	62.3	0.0	104.5	0.0	232.7	14.3	413.8	15.1	0.0	25.2	0.0	56.2	3.5	100.0
FWM032	Wairoa LTB	Rural	1663.1	4.3	2457.8	9.5	7241.6	3.8	11380.1	14.6	0.0	21.6	0.1	63.6	0.0	100.0
FWM092	Wairoa Tributary	Native forest	0.0	0.0	216.3	0.0	0.0	0.0	216.3	0.0	0.0	100.0	0.0	0.0	0.0	100.0
FWM066	Waitakere	Rural	2.5	0.0	2282.8	38.4	131.5	45.4	2500.7	0.1	0.0	91.3	1.5	5.3	1.8	100.0
FWM093	Waitangi Stream	Rural	6.0	164.3	63.1	0.0	1617.3	0.0	1850.7	0.3	8.9	3.4	0.0	87.4	0.0	100.0
FWM010	Waiwhui (Frith)	Exotic forest	134.8	0.0	304.4	0.0	10.2	0.0	449.3	30.0	0.0	67.7	0.0	2.3	0.0	100.0

FWM050	Wekatahi	Native forest	0.0	0.0	221.7	0.0	0.0	0.0	221.7	0.0	0.0	100.0	0.0	0.0	0.0	100.0
FWM046	West Hoe LTB	Native forest	0.0	0.0	51.6	0.0	1.8	0.0	53.4	0.0	0.0	96.5	0.0	3.5	0.0	100.0

8.5.1.3 Macroinvertebrate data for ARC stream sites used for this project

Appendix 8.5.1.3 A (1-10 of 68 samples): Auckland Regional Council macroinvertebrate data (2009 sampling round).

	Awarere @ Dibble	Riverhead	Onepoto	Waiwhiu @ Frith	Puhinui trib	Puhoi	Oteha	Vaughan Upper	Puhinui Upper	Chatswood
	FWM004	FWM008	FWM009	FWM010	FWM011	FWM012	FWM013	FWM014	FWM015	FWM016
	Awarere @ Dibble	Riverhead	Onepoto	Waiwhiu @ Frith	Puhinui trib	Puhoi	Oteha	Vaughan Upper	Puhinui Upper	Chatswood
	11-Mar-09	3-Feb-09	30-Jan-09	11-Mar-09	28-Jan-09	26-Feb-09	29-Jan-09	4-Feb-09	28-Jan-09	30-Jan-09
	SB	SB	SB	SB	SB	SB	SB	SB	HB	HB
	09004	09008	09-009	09010	09-011	09012	09013	09014	09015	09016
OLIGOCHAETA	C	C	R	A	VA	R	R	R	A	VA
NEMATODA					R					
NEMATOMORPHA										
NEMERTEA				A	C		R	R	C	
HYDROIDS					R					
BRYOZOA							C			
HIRUDINEA										
<i>Alboglossiphonia</i>							R			
<i>Barbronia</i>										
<i>Placobdella</i>										
Platyhelminthes			R		C		R	R	R	R
Rhabdocoela				R						
MOLLUSCS										
<i>Cucumerunio</i>										
<i>Ferrissia</i>			R	C	R				R	

<i>/Gundlachia</i>										
<i>Gyraulus</i>							A			R
<i>Hyridella</i>		R								
<i>Latia</i>		C							A	
Lymnaeidae				C			R			
<i>Melanopsis</i>										
<i>Physa/Physella</i>			A		A		R			A
<i>Potamopyrgus</i>	A	VA	VA	VA	VVA	C	VA	A	VVA	
Sphaeriidae		C	R	R			R		R	
CRUSTACEA										
Amphipoda										
Cladocera					A					
Copepoda		R	R		C					
Isopoda		R				R		R		
Mysid shrimps										
Ostracoda	R	R		A	R			R	R	
<i>Paracalliope</i>		A						VA	A	
<i>Paraleptamphopus</i>	A	R				A			R	
<i>Paranephrops</i>	R	R		R		C		R		
<i>Paranthura</i>										
<i>Paratya</i>		C	C			R	R	C		R
<i>Phreatogammarus</i>										
Talitridae	R		R			R	R	R		R
ACARINA	R	R	R	A	C	R	R	R	R	R

ARACHNIDA										
<i>Dolomedes aquaticus</i>										
DOBSONFLIES										
<i>Archichauliodes</i>	R									
LACEWINGS										
<i>Kempynus</i>										
DRAGONFLIES										
<i>Antipodochlora</i>		R	R	R	R	R				
<i>Austroletes</i>	R	C		R						
<i>Hemicordulia</i>			R				R			
<i>Ischnura</i>										
<i>Procordulia</i>										
<i>Xanthocnemis</i>	A	R	C	R	C		R			
tail-less damselflies										
juvenile dragonflies (Anisoptera)										
MAYFLIES										
<i>Acanthophlebia</i>										
<i>Ameletopsis</i>										
<i>Arachnocolus</i>	A	R		R	R	C		A		
<i>Atalophlebioides</i>										
<i>Austroclima</i>	R			C		R			VA	
<i>Austronella</i>										

<i>Coloburiscus</i>	R								R	
<i>Deleatidium</i>	R									
<i>Ichthybotus</i>										
<i>Isothraulus</i>						R		R		
<i>Mauiulus</i>										
<i>Neozephlebia</i>	R					C		R	A	
<i>Nesameletus</i>	C									
<i>Oniscigaster</i>										
<i>Rallidens</i>										
<i>Siphlaenigma</i>	R									
<i>Tepakia</i>	R	A		R	R	R		A		
<i>Zephlebia</i>	VA	C		VA	R	VA		VA	A	
STONEFLIES										
<i>Acroperla</i>										
<i>Austroperla</i>						R				
<i>Megaleptoperla</i>				R		R				
<i>Nesoperla</i>										
<i>Spaniocerca</i>										
<i>Stenoperla</i>										
<i>Taraperla</i>										
<i>Zelandobius</i>										R
<i>Zelandoperla</i>										
CADDISFLIES										
<i>Alloecentrella</i>										

<i>Aoteapsyche</i>										
<i>Beraeoptera</i>										
<i>Confluens</i>										
<i>Costachorema</i>										
<i>Cryptobiosella</i>										
<i>Ecnomina</i>										
<i>Helicopsyche</i>										
<i>Hudsonema</i>										
<i>Hydrobiosella</i>										
<i>Hydrobiosis</i>				R						
<i>Hydrochorema</i>										
<i>Neurochorema</i>										
<i>Oecetis</i>										
Oeconesidae								R		
<i>Olinga</i>										
<i>Orthopsyche</i>									VVA	
<i>Oxyethira</i>		R		C						R
<i>Paroxyethira</i>										
<i>Plectrocnemia</i>										
<i>Polypectropus</i>		R	C	R		R		A	R	
<i>Psilochorema</i>	R									
<i>Pycnocentria</i>									A	
<i>Pycnocentroides</i>				R						
<i>Tiphobiosis</i>										

<i>Triplectides</i>		A	VA	A	VA		C	C	C	
<i>Zelandoptila</i>		R	R							
<i>Zelolessica</i>										
BEETLES										
<i>Antiporus</i>										
<i>Copelatus</i>										
Elmidae	R								R	
<i>Enochrus</i>										
Hydraenidae										
Hydrophilidae	R	R								
<i>Hyphydrus</i>										
<i>Liodessus</i>										
Ptilodactylidae									R	
<i>Rhantus</i>										
Scirtidae								R		
Staphylinidae										
WATER BUGS										
<i>Anisops</i>							R			
<i>Diaprepocoris</i>										
<i>Mesovelgia</i>			R				R	R		
<i>Microvelia</i>	R	C				C			R	
Saldidae										
<i>Sigara</i>				A						
MOTHS										

<i>Hygraula</i>										
TRUE FLIES										
Anthomyiidae (muscids)										
<i>Aphrophilia</i>									R	
<i>Austrosimulium</i>	R			R						A
Ceratopogonidae								R		
Chironomidae indet.										
<i>Chironomus</i>									R	R
<i>Corynoneura</i>										
Culicidae indet.										
Diptera indet.										
Dixidae pupa										
Dolichopodidae										
Empididae		R				R				R
Ephydriidae										
Eriopterini										
<i>Harrisius</i>		C	R		A		C	C		
Hexatomini	R								R	
<i>Limonia</i>			R				R		R	R
<i>Lobodimaesa</i>										
<i>Maoridiamesa</i>										
<i>Mischoderus</i>									C	R

<i>Molophilus</i>										
Muscidae	R			R				R	R	R
<i>Neocurupira</i> Blepharicerid										
<i>Neolimnia</i>	R				R					
<i>Nothodixa</i>										
Orthocladiinae		R	R	R					R	A
Orthocladiinae sp. A "hi-rise"										
<i>Parochlus</i>										
<i>Paradixa</i>	A	C	C	R	R	C		A	R	
<i>Paralimnophila</i>										
<i>Paucispinigera</i>										
<i>Polypedilum</i>		R	C			R	R	R	A	R
Psychodidae										
Sarcophagidae										
Stratiomyidae										
Tabanidae										
Tanypodinae		R	R		R	R		C		
<i>Tanytarsus</i>		R							A	R
Thaumaleidae										
Tipulidae indet.										
<i>Zelandotipula</i>							R			R
COLLEMBOLA	R	R	R		R		R	R	R	R

Richness	29	33	24	28	23	23	23	28	33	20
Ephem richness	9	3	0	4	3	6	0	5	4	0
Plec richness	0	0	0	1	0	2	0	0	0	1
Tric richness	1	4	3	5	1	1	1	3	4	1
EPT richness	10	7	3	10	4	9	1	8	8	2
% Ephem	31.0%	9.1%	0.0%	14.3%	13.0%	26.1%	0.0%	17.9%	12.1%	0.0%
% Plecoptera	0.0%	0.0%	0.0%	3.6%	0.0%	8.7%	0.0%	0.0%	0.0%	5.0%
% Trichoptera	3.4%	12.1%	12.5%	17.9%	4.3%	4.3%	4.3%	10.7%	12.1%	5.0%
% EPT	34.5%	21.2%	12.5%	35.7%	17.4%	39.1%	4.3%	28.6%	24.2%	10.0%
MCI	115.9	95.2	92.5	95.0	90.4	116.5	84.3	105.0	97.0	72.0
MCI-sb	117.4	104.2	87.3	87.3	81.6	128.2	66.1	110.3	106.1	80.5
SQMCI	6.0	4.7	4.4	4.8	3.8	6.4	4.0	6.0	6.4	1.8
SQMCI-sb	6.8	4.1	3.8	4.6	2.8	7.8	2.4	6.8	5.1	3.4

Appendix 8.5.1.3 B (11-20 of 68samples): Auckland Regional Council macroinvertebrate data (2009 sampling round).

	Hunua @ St Pauls	Orere B	Orere A	Kumeu LTB	Hoteo @ Kraak	Symonds	Mahurangi LTB	Matakana LTB	Wairoa LTB	Papakura LTB
	FWM018	FWM019	FWM020	FWM021	FWM022	FWM024	FWM028	FWM031	FWM032	FWM033
	Hunua @ St Pauls	Orere B	Orere A	Kumeu LTB	Hoteo @ Kraak	Symonds	Mahurangi LTB	Matakana LTB	Wairoa LTB	Papakura LTB
	12/02/2009	13-Feb-09	13-Feb-09	2-Mar-09	11-Mar-09	12-Feb-09	26-Feb-09	26-Feb-09	17-Feb-09	18-Feb-09
	HB	HB	HB	SB	SB	HB	SB	SB	SB	SB
	09018	09019	09020	09021	09022	09024	09028	09031	09032	09033
OLIGOCHAETA	R	C	R	R	C	C	R	R	C	R
NEMATODA										
NEMATOMORPHA										
NEMERTEA			R	R	C	R		R		C
HYDROIDS					R	R				R
BRYOZOA										
HIRUDINEA										
<i>Alboglossiphonia</i>										
<i>Barbronia</i>										
<i>Placobdella</i>										
PLATYHELMINTHES	C	A	C	C		C	R			A
Rhabdocoela										R
MOLLUSCS										
<i>Cucumerunio</i>										
<i>Ferrissia</i>	R	R	R	A	R	R				R

<i>/Gundlachia</i>										
<i>Gyraulus</i>										
<i>Hyridella</i>										
Lymnaeidae					C		R			
<i>Melanopsis</i>										
<i>Physa/Physella</i>				C		R		C		A
<i>Potamopyrgus</i>	C	C	C	A	VA	VA	A	VA	A	VVA
Sphaeriidae										R
CRUSTACEA										
Amphipoda										
Cladocera				A						R
Copepoda				A						R
Isopoda										
Mysid shrimps										
Ostracoda					R	C			R	
<i>Paracalliope</i>				VA		R	A	A	VA	A
<i>Paraleptamphopus</i>	R	A	R							
<i>Paranephrops</i>	R		R	R					R	
<i>Paranthura</i>										
<i>Paratya</i>				R					A	C
<i>Phreatogammarus</i>				C						
Talitridae	R									
ACARINA	R	R		R	C		R	R	R	R
ARACHNIDA										

<i>Dolomedes aquaticus</i>										
DOBSONFLIES										
<i>Archichauliodes</i>	A	AA	A		R	A				
LACEWINGS										
<i>Kempynus</i>										
DRAGONFLIES										
<i>Antipodochlora</i>					R			R		
<i>Austroletes</i>				R	R		R			
<i>Hemicordulia</i>										
<i>Ischnura</i>										
<i>Procordulia</i>							R			
<i>Xanthocnemis</i>				C	A		C	R	R	R
tail-less damselflies										
juvenile dragonflies (Anisoptera)										
MAYFLIES										
<i>Acanthophlebia</i>		A	A			R				
<i>Ameletopsis</i>		R	R							
<i>Arachnocolus</i>										
<i>Atalophlebioides</i>										
<i>Austroclima</i>	VA	C	C		C	A	C	A	C	
<i>Austronella</i>										
<i>Coloburiscus</i>	VA	A	VA				R			

<i>Deleatidium</i>	A	VA	A		C	VA	R			
<i>Ichthybotus</i>	R	A	C							
<i>Isothraulus</i>										
<i>Mauiulus</i>								R		
<i>Neozephlebia</i>	C	C	R		R		C			
<i>Nesameletus</i>	C	A	C							
<i>Oniscigaster</i>										
<i>Rallidens</i>										
<i>Siphlaenigma</i>										
<i>Tepakia</i>					A		R			
<i>Zephlebia</i>	A	A	A		VA	A	VA	VVA	VA	
STONEFLIES										
<i>Acroperla</i>										
<i>Austroperla</i>	R		R							
<i>Megaleptoperla</i>	R	C	R			R				
<i>Nesoperla</i>										
<i>Spaniocerca</i>	R	R								
<i>Stenoperla</i>		R	R							
<i>Taraperla</i>	R									
<i>Zelandobius</i>						R				
<i>Zelandoperla</i>	R	R								
CADDISFLIES										
<i>Alloecentrella</i>										
<i>Aoteapsyche</i>		R				VA				

<i>Beraeoptera</i>		R								
<i>Confluens</i>										
<i>Costachorema</i>										
<i>Cryptobiosella</i>										
<i>Ecnomina</i>										
<i>Helicopsyche</i>	R	A	A							
<i>Hudsonema</i>						C	R		R	
<i>Hydrobiosella</i>		R	R							
<i>Hydrobosis</i>	R	C	C		R	C				
<i>Hydrochorema</i>		R	R							
<i>Neurochorema</i>										
<i>Oecetis</i>							R	R	R	
Oeconesidae			R							
<i>Olinga</i>	R	A	A			R				
<i>Orthopsyche</i>	A	VA	A		R					
<i>Oxyethira</i>				A	R	A	R	C		VA
<i>Paroxyethira</i>				R			R	R		C
<i>Plectrocnemia</i>							R			
<i>Polyplectropus</i>					R		C	R	R	
<i>Psilochorema</i>	R	R	C		C			R	R	
<i>Pycnocentria</i>			R			R			C	
<i>Pycnocentroides</i>						A		R	C	
<i>Tiphobiosis</i>										
<i>Triplectides</i>					A	R	A	A	A	

<i>Zelandoptila</i>										
<i>Zelolessica</i>	R		R							
BEETLES										
<i>Antiporus</i>										
<i>Copelatus</i>										
Elmidae	R	R	R		A	VA	R		R	
<i>Enochrus</i>										
Hydraenidae	A	A	C							
Hydrophilidae		R			R					
<i>Hyphydrus</i>										
<i>Liodesus</i>										
Ptilodactylidae	R	A	C		R					
<i>Rhantus</i>										
Scirtidae										
Staphylinidae										
WATER BUGS										
<i>Anisops</i>										R
<i>Diaprepocoris</i>										
<i>Mesovelia</i>								R		
<i>Microvelia</i>	R	R			C		C			R
Saldidae										
<i>Sigara</i>										R
MOTHS										
<i>Hygraula</i>										

TRUE FLIES										
Anthomyiidae (muscsids)						R				
<i>Aphrophilia</i>	C	R	R			C				
<i>Austrosimulium</i>		R	R		A	A	C	A	R	
Ceratopogonidae		R								
Chironomidae indet.										
<i>Chironomus</i>										
<i>Corynoneura</i>										
Culicidae indet.										
Diptera indet.										
Dixidae pupa										
Dolichopodiae										
Empididae		R	R			R				
Ephydridae										
Eriopterini			R		R					
<i>Harrisius</i>				C	R	R			R	R
Hexatomini		R								
<i>Limonia</i>	R				R					
<i>Lobodimaesa</i>										
<i>Maoridiamesa</i>										
<i>Mischoderus</i>						R	R			
<i>Molophilus</i>					R					

Muscidae				R	R			R		
<i>Neocurupira</i>										
Blepharicerid										
<i>Neolimnia</i>					R					
<i>Nothodixa</i>										
Orthocladiinae	R		R	C	C	C		R		A
Orthocladiinae sp. A "hi-rise"										
<i>Parochlus</i>										
<i>Paradixa</i>		R			R				R	
<i>Paralimnophila</i>					R					
<i>Paucispinigera</i>										
<i>Polypedilum</i>	R	R	R	R				R	R	
Psychodidae										
Sarcophagidae										
Stratiomyidae										
Tabanidae										
Tanypodinae		C	R		R			R	R	
<i>Tanytarsus</i>		A	R		R	R	R			R
Thaumaleidae										
Tipulidae indet.										
<i>Zelandotipula</i>										
COLLEMBOLA	R	R			C			R		

Richness	37	44	41	22	40	33	28	24	24	23
Ephem richness	7	9	9	0	5	4	6	3	2	0
Plec richness	5	4	3	0	0	2	0	0	0	0
Tric richness	6	9	10	2	6	8	7	7	7	2
EPT richness	18	22	22	2	11	14	13	10	9	2
% Ephem	18.9%	20.5%	22.0%	0.0%	12.5%	12.1%	21.4%	12.5%	8.3%	0.0%
% Plecoptera	13.5%	9.1%	7.3%	0.0%	0.0%	6.1%	0.0%	0.0%	0.0%	0.0%
% Trichoptera	16.2%	20.5%	24.4%	9.1%	15.0%	24.2%	25.0%	29.2%	29.2%	8.7%
% EPT	48.6%	50.0%	53.7%	9.1%	27.5%	42.4%	46.4%	41.7%	37.5%	8.7%
MCI	130.3	128.2	133.2	76.4	105.0	95.8	107.1	91.7	103.3	74.8
MCI-sb	131.0	135.3	132.4	66.2	103.2	99.2	99.0	91.9	114.5	53.6
SQMCI	8.2	7.5	8.1	4.3	5.4	5.4	6.0	6.3	5.6	3.6
SQMCI-sb	7.1	6.8	7.6	3.6	5.2	5.2	6.7	7.3	6.3	2.0

Appendix 8.5.1.3 C (21-31 of 61 samples): Auckland Regional Council macroinvertebrate data (2009 sampling round).

	Opanuku	Oakley LTB	Ngakaroa LTB	Otara LTB	Puhinui LTB	Lucus LTB	Vaughan Lower	Milne	Konini	Mangata whiri	West Hoe LTB
	FWM034	FWM035	FWM037	FWM038	FWM039	FWM040	FWM041	FWM043	FWM044	FWM045	FWM046
	Opanuku	Oakley LTB	Ngakaroa LTB	Otara LTB	Puhinui LTB	Lucus LTB	Vaughan Lower	Milne	Konini	Mangata whiri	West Hoe LTB
	2-Feb-09	3-Mar-09	12-Feb-09	18-Feb-09	18-Feb-09	29-Jan-09	4-Feb-09	4-Mar-09	4-Mar-09	4-Mar-09	5-Mar-09
	HB	SB	SB	SB	SB	SB	SB	HB	HB	HB	SB
	09034	09035	09037	09038	09039	09040	09041	09043	09044	09045	09046
OLIGOCHAETA	R	R	A	VA	A	A	C		R		C
NEMATODA	R										
NEMATOMORPHA									R		
NEMERTEA	R	R	R	A	C	R	R	R			
HYDROIDS		R		R	A	R					
BRYOZOA											
HIRUDINEA											
<i>Alboglossiphonia</i>			R	C	C	R	C				
<i>Barbronia</i>											
<i>Placobdella</i> (suckers at both ends)				R							
PLATYHELMINTHES	R	R	R	A	VA	A	C	A	R		

Rhabdocoela		R		A	R						
MOLLUSCS											
<i>Cucumerunio</i>											
<i>Ferrissia</i> <i>/Gundlachia</i>	A	R		R	R						
<i>Gyraulus</i>		R	C	C	A						
<i>Hyridella</i>											
<i>Latia</i>	A								R		
Lymnaeidae				C	A	C	R				
<i>Melanopsis</i>							A				
<i>Physa/Physella</i>		R	VVA	A	C	C	R				
<i>Potamopyrgus</i>	A	VVA	VVA	VA	A	VVA	VVA	C	C	R	A
Sphaeriidae		R				A	R				
CRUSTACEA											
Amphipoda											
Cladocera			A	C	C	R	C				
Copepoda				R	R		R				
Isopoda			R		C		R				R
Mysid shrimps											
Ostracoda			VVA	R	R	C					
<i>Paracalliope</i>		A		R		VA					
<i>Paraleptamphopus</i>								R			R
<i>Paranephrops</i>											
<i>Paranthura</i>											

<i>Paratya</i>		C		C		R	VA				C
<i>Phreatogammarus</i>											
Talitridae						R					
ACARINA	C	C	C	C	R	R	C	R	R	R	R
ARACHNIDA											
<i>Dolomedes aquaticus</i>											
DOBSONFLIES											
<i>Archichauliodes</i>	C					R		A	A	C	
LACEWINGS											
<i>Kempynus</i>											
DRAGONFLIES											
<i>Antipodochlora</i>											
<i>Austroletes</i>			R								
<i>Hemicordulia</i>				R		R					
<i>Ischnura</i>											
<i>Procordulia</i>					R						
<i>Xanthocnemis</i>		A	A	VA	A	C	C				R
tail-less damselflies											
juvenile dragonflies (Anisoptera)											
MAYFLIES											
<i>Acanthophlebia</i>								C	C	A	
<i>Ameletopsis</i>								R	C	R	

<i>Arachnocolus</i>											C
<i>Atalophlebioides</i>											
<i>Austroclima</i>							R		R	R	
<i>Austronella</i>											
<i>Coloburiscus</i>							VA	VA	VA	R	
<i>Deleatidium</i>							VA	VA	VA		
<i>Ichthybotus</i>							C	R			
<i>Isothraulius</i>											
<i>Mauiulus</i>											
<i>Neozephlebia</i>							R		R	R	
<i>Nesameletus</i>							R	R			
<i>Oniscigaster</i>											
<i>Rallidens</i>											
<i>Siphlaenigma</i>											
<i>Tepakia</i>											R
<i>Zephlebia</i>	R					R	A	C	R	VA	
STONEFLIES											
<i>Acroperla</i>											
<i>Austroperla</i>							R	R	C		
<i>Megaleptoperla</i>							R				
<i>Nesoperla</i>											
<i>Spaniocerca</i>							R	R	R	R	
<i>Stenoperla</i>							R	C	C		
<i>Taraperla</i>											

<i>Zelandobius</i>								C	C	C	
<i>Zelandoperla</i>								R	A	A	
CADDISFLIES											
<i>Alloecentrella</i>											
<i>Aoteapsyche</i>	VA								A	VA	
<i>Beraeoptera</i>									R	R	
<i>Confluens</i>											
<i>Costachorema</i>	R							R		C	
<i>Cryptobiosella</i>											
<i>Ecnomina</i>											
<i>Helicopsyche</i>								C	A	C	
<i>Hudsonema</i>											
<i>Hydrobiosella</i>								A	C	C	R
<i>Hydrobiosis</i>	R							C		C	
<i>Hydrochorema</i>											
<i>Neurochorema</i>											
<i>Oecetis</i>											
Oeconesidae											
<i>Olinga</i>								C	A	C	
<i>Orthopsyche</i>								A	A	C	R
<i>Oxyethira</i>	VA	C	A	C	R		C				
<i>Paroxyethira</i>		R	A	C		R					
<i>Plectrocnemia</i>								R			
<i>Polypectropus</i>			R								R

<i>Psilochorema</i>								R	R	R	
<i>Pycnocentria</i>						C		R	R	R	R
<i>Pycnocentrodes</i>	C										
<i>Tiphobiosis</i>											
<i>Triplectides</i>		C	VA			VA		R			
<i>Zelandoptila</i>						R					
<i>Zelolessica</i>										R	
BEETLES											
<i>Antiporus</i>											
<i>Copelatus</i>											
Elmidae	C							A	C	A	R
<i>Enochrus</i>											
Hydraenidae								R	A	C	
Hydrophilidae											
<i>Hyphydrus</i>											
<i>Liodessus</i>											
Ptilodactylidae								R	C		
<i>Rhantus</i>											
Scirtidae											
Staphylinidae											
WATER BUGS											
<i>Anisops</i>											
<i>Diaprepocoris</i>			R								
<i>Mesovelgia</i>						R					

<i>Microvelia</i>			A				R				R
Saldidae											
<i>Sigara</i>			A	C	R						
MOTHS											
<i>Hygraula</i>											
TRUE FLIES											
Anthomyiidae (muscsids)											
<i>Aphrophilia</i>	A								R	A	
<i>Austrosimulium</i>	C		R			R		R			
Ceratopogonidae											
Chironomidae indet.											
<i>Chironomus</i>							R				
<i>Corynoneura</i>			R								
Culicidae indet.											
Diptera indet.											
Dixidae pupa											
Dolichopodidae											
Empididae	A										
Ephydridae											
Eriopterini								C		R	
<i>Harrisius</i>		R									
Hexatomini											

<i>Limonia</i>	R							R			R
<i>Lobodimaesa</i>											
<i>Maoridiamesa</i>											
<i>Mischoderus</i>	R										
<i>Molophilus</i>											
Muscidae	R		R		R		R				
<i>Neocurupira</i>											
Blepharicerid											
<i>Neolimnia</i>						R					
<i>Nothodixa</i>											
Orthoclaadiinae	C		C	C				R			R
Orthoclaadiinae sp. A "hi-rise"											
<i>Parochlus</i>											
<i>Paradixa</i>			A								A
<i>Paralimnophila</i>											
<i>Paucispinigera</i>											
<i>Polypedilum</i>	C							R	R	R	R
Psychodidae											
Sarcophagidae											
Stratiomyidae											
Tabanidae											
Tanypodinae			C			R	R		R	R	R
<i>Tanytarsus</i>	VA		R	C			R	C	C	C	

Thaumaleidae											
Tipulidae indet.											
<i>Zelandotipula</i>											
COLLEMBOLA		R	R	R							
Richness	25	19	28	26	21	27	21	40	34	33	25
Ephem richness	1	0	0	0	0	1	0	9	7	7	6
Plec richness	0	0	0	0	0	0	0	6	5	5	1
Tric richness	5	3	4	2	1	4	1	10	8	11	4
EPT richness	6	3	4	2	1	5	1	25	20	23	11
% Ephem	4.0%	0.0%	0.0%	0.0%	0.0%	3.7%	0.0%	22.5%	20.6%	21.2%	24.0%
% Plecoptera	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	15.0%	14.7%	15.2%	4.0%
% Trichoptera	20.0%	15.8%	14.3%	7.7%	4.8%	14.8%	4.8%	25.0%	23.5%	33.3%	16.0%
% EPT	24.0%	15.8%	14.3%	7.7%	4.8%	18.5%	4.8%	62.5%	58.8%	69.7%	44.0%
MCI	80.0	73.7	77.9	71.5	72.4	85.9	71.4	138.5	134.1	145.5	120.0
MCI-sb	94.4	57.2	65.3	46.2	40.6	73.3	52.7	136.8	139.4	144.8	124.6
SQMCI	3.3	4.1	3.5	3.3	3.2	4.1	4.1	7.7	8.1	7.1	6.0
SQMCI-sb	4.1	2.3	1.8	2.1	1.5	3.1	2.3	6.8	7.1	6.9	7.4

Appendix 8.5.1.3 D (32-41 of 68 samples): Auckland Regional Council macroinvertebrate data (2009 sampling round).

	Nukumea	Cascades LTB	Marawhara	Wekatahi	Shakespear	Otanerua	Mt. Auckland	Awanohi Upper 1	Awanohi Mid	Awanohi Lower
	FWM047	FWM048	FWM049	FWM050	FWM051	FWM052	FWM056	FWM057	FWM060	FWM061
	Nukumea	Cascades LTB	Marawhara	Wekatahi	Shakespear	Otanerua	Mt. Auckland	Awanohi Upper 1	Awanohi Mid	Awanohi Lower
	5-Mar-09	2-Feb-09	25-Feb-09	25-Feb-09	4-Feb-09	5-Mar-09	18-Feb-09	10-Feb-09	11-Feb-09	4-Feb-09
	SB	HB	HB	HB	SB	SB	SB	SB	SB	SB
	09047	09048	08049	09050	09051	09052	09056	09057	09060	09061
OLIGOCHAETA	R	C		R	C	C	R		C	C
NEMATODA			R							
NEMATOMORPHA										
NEMERTEA		C	C	C						R
HYDROIDS										
BRYOZOA										
HIRUDINEA										
<i>Alboglossiphonia</i>			R							R
<i>Barbronia</i>										
<i>Placobdella</i> (suckers at both ends)										
PLATYHELMINTHES		R		R						R
Rhabdoceola										
MOLLUSCS										

<i>Cucumerunio</i>										
<i>Ferrissia /Gundlachia</i>		C								
<i>Gyraulus</i>										
<i>Hyridella</i>										
<i>Latia</i>		A	C	C						
Lymnaeidae										
<i>Melanopsis</i>	R									
<i>Physa/Physella</i>										C
<i>Potamopyrgus</i>	C	VA	A	VA	VA	R	A		VA	VA
Sphaeriidae					C		R		R	C
CRUSTACEA										
Amphipoda										
Cladocera										
Copepoda	R				C			R		R
Isopoda					R			R		
Mysid shrimps										
Ostracoda			R	R	R					
<i>Paracalliope</i>	C		R		VA	C	R		A	C
<i>Paraleptamphopus</i>					A	R	A		C	
<i>Paranephrops</i>				R			R	C	R	
<i>Paranthura</i>										
<i>Paratya</i>	R		C	C		C		R	A	VA
<i>Phreatogammarus</i>										
Talitridae									C	

ACARINA	R	R	R	R	C	C	C	R	R	R
ARACHNIDA										
<i>Dolomedes aquaticus</i>									R	
DOBSONFLIES										
<i>Archichauliodes</i>		R	C	C					R	
LACEWINGS										
<i>Kempynus</i>										
DRAGONFLIES										
<i>Antipodochlora</i>										
<i>Austroletes</i>					R					
<i>Hemicordulia</i>										
<i>Ischnura</i>										
<i>Procordulia</i>										
<i>Xanthocnemis</i>	R				C				R	R
tail-less damselflies										
juvenile dragonflies (Anisoptera)										
MAYFLIES										
<i>Acanthophlebia</i>			C	A						
<i>Ameletopsis</i>			R	R						
<i>Arachnocolus</i>	R				C	R	A	A		
<i>Atalophlebioides</i>										
<i>Austroclima</i>	R		R	R		R	R	R	R	
<i>Austronella</i>										

<i>Coloburiscus</i>	R	C	VA	VA			R			
<i>Deleatidium</i>		R	VA	VA						
<i>Ichthybotus</i>										
<i>Isothraulus</i>										
<i>Mauiulus</i>										
<i>Neozephebia</i>	R		A	A		R	C		R	
<i>Nesameletus</i>				C			C			
<i>Oniscigaster</i>										
<i>Rallidens</i>										
<i>Siphlaenigma</i>										
<i>Tepakia</i>	R				A	R	C	A	A	A
<i>Zephebia</i>	VA	R	C	A	A	A	VA	VA	A	A
STONEFLIES										
<i>Acroperla</i>										
<i>Austroperla</i>		R					R			
<i>Megaleptoperla</i>				R						
<i>Nesoperla</i>		R								
<i>Spaniocerca</i>										
<i>Stenoperla</i>			R							
<i>Taraperla</i>										
<i>Zelandobius</i>										
<i>Zelandoperla</i>		R		R						
CADDISFLIES										
<i>Alloecentrella</i>										

<i>Aoteapsyche</i>		VA	A	C						
<i>Beraeoptera</i>			R	R						
<i>Confluens</i>		R	R							
<i>Costachorema</i>		R								
<i>Cryptobiosella</i>										
<i>Ecnomina</i>										
<i>Helicopsyche</i>			A	A						
<i>Hudsonema</i>			R	C						R
<i>Hydrobiosella</i>				R				R		
<i>Hydrobiosis</i>		R	R							
<i>Hydrochorema</i>										
<i>Neurochorema</i>		R	R							
<i>Oecetis</i>										
Oeconesidae										
<i>Olinga</i>			VA	VA						
<i>Orthopsyche</i>			R	R						
<i>Oxyethira</i>		VA								
<i>Paroxyethira</i>		R								
<i>Plectrocnemia</i>							R			
<i>Polypectropus</i>	R		R	R	A	R	R	R	C	R
<i>Psilochorema</i>			R	R			R			
<i>Pycnocentria</i>	C		R	R	C	C			A	R
<i>Pycnocentrodes</i>		A	A	A						
<i>Tiphobiosis</i>										

<i>Triplectides</i>	R		R	R	A	R	C	R	A	VA
<i>Zelandoptila</i>					R				R	
<i>Zelolessica</i>		R								
BEETLES										
<i>Antiporus</i>										
<i>Copelatus</i>										
Elmidae		C	C	C			R			
<i>Enochrus</i>										
Hydraenidae	R	R	A	C						
Hydrophilidae					R					
<i>Hyphydrus</i>										
<i>Liodessus</i>										
Ptilodactylidae		R								
<i>Rhantus</i>										
Scirtidae								R		
Staphylinidae										
WATER BUGS										
<i>Anisops</i>										
<i>Diaprepocoris</i>										
<i>Mesovelgia</i>										
<i>Microvelia</i>					R		C		R	
Saldidae										
<i>Sigara</i>										
MOTHS										

<i>Hygraula</i>										
TRUE FLIES										
Anthomyiidae (muscids)										
<i>Aphrophilia</i>		A	R	R						
<i>Austrosimulium</i>		A	A	C						
Ceratopogonidae										
Chironomidae indet.										
<i>Chironomus</i>										R
<i>Corynoneura</i>										
Culicidae indet.										
Diptera indet.										
Dixidae pupa										
Dolichopodidae										
Empididae		A				R				
Ephydridae										
Eriopterini										
<i>Harrisius</i>	R			R		R		R	R	R
Hexatomini			R						R	
<i>Limonia</i>	R	R								
<i>Lobodimaesa</i>										
<i>Maoridiamesa</i>		C								
<i>Mischoderus</i>										
<i>Molophilus</i>										

Muscidae		R								
<i>Neocurupira</i>										
Blepharicerid										
<i>Neolimnia</i>										
<i>Nothodixa</i>										
Orthoclaadiinae	R	A	R	R		R				
Orthoclaadiinae sp. A "hi-rise"										
<i>Parochlus</i>										
<i>Paradixa</i>	R				A	C	A	C	A	C
<i>Paralimnophila</i>										
<i>Paucispinigera</i>	R									
<i>Polypedilum</i>			R		R	R	R	R	R	R
Psychodidae										
Sarcophagidae										
Stratiomyidae										
Tabanidae					R					
Tanypodinae	R		R	R	R	R		R	C	R
<i>Tanytarsus</i>	R	VA	R	R			R			
Thaumaleidae										
Tipulidae indet.										
<i>Zelandotipula</i>								R	R	
COLLEMBOLA	R	R				R			R	R

Richness	26	35	41	40	24	21	24	18	28	24
Ephem richness	6	3	7	8	3	5	7	4	4	2
Plec richness	0	3	1	2	0	0	1	0	0	0
Tric richness	3	9	14	12	4	3	4	3	4	4
EPT richness	9	15	22	22	7	8	12	7	8	6
% Ephem	23.1%	8.6%	17.1%	20.0%	12.5%	23.8%	29.2%	22.2%	14.3%	8.3%
% Plecoptera	0.0%	8.6%	2.4%	5.0%	0.0%	0.0%	4.2%	0.0%	0.0%	0.0%
% Trichoptera	11.5%	25.7%	34.1%	30.0%	16.7%	14.3%	16.7%	16.7%	14.3%	16.7%
% EPT	34.6%	42.9%	53.7%	55.0%	29.2%	38.1%	50.0%	38.9%	28.6%	25.0%
MCI	113.1	102.3	118.5	125.0	102.5	107.6	120.0	123.3	110.0	92.5
MCI-sb	112.6	105.8	122.4	123.9	108.5	120.5	131.8	126.9	116.6	92.2
SQMCI	6.6	3.5	7.5	7.2	5.1	5.5	6.2	7.0	5.1	4.9
SQMCI-sb	7.8	3.9	6.6	6.2	5.1	6.7	7.4	8.3	4.9	4.3

Appendix 8.5.1.3 E (42-51 of 68 samples): Auckland Regional Council macro invertebrate data (2009 sampling round).

	Okura Trib 1	Okura Trib 2	Campbells Bay	Kauritutahi	Waitakare	Aroara	Duders	Lignite	Eskdale Lower	Eskdale Mid
	FWM062	FWM063	FWM064	FWM065	FWM066	FWM068	FWM069	FWM070	FWM071	FWM072
	Okura Trib 1	Okura Trib 2	Campbells Bay	Kauritutahi	Waitakare	Aroara	Duders	Lignite	Eskdale Lower	Eskdale Mid
	11-Feb-09	10-Feb-09	30-Jan-09	3-Mar-09	25-Feb-09	12-Feb-09	17-Feb-09	29-Jan-09	5-Feb-09	5-Feb-09
	SB	SB	SB	SB	HB	HB	SB	SB	SB	SB
	09062	09063	09064	09065	09066	09068	09069	09070	09071	09072
OLIGOCHAETA	R	R	A	C	C	R	VA	A	A	C
NEMATODA	C									
NEMATOMORPHA										
NEMERTEA						R	R	R	C	
HYDROIDS								R		R
BRYOZOA							R			
HIRUDINEA										
<i>Alboglossiphonia</i>			R				R			
<i>Barbronia</i>										
<i>Placobdella</i> (suckers at both ends)										
PLATYHELMINTHES	R			R	R		C	A	A	R
Rhabdocoela					C		A			
MOLLUSCS										

<i>Cucumerunio</i>										
<i>Ferrissia /Gundlachia</i>			R		R	R				R
<i>Gyraulus</i>										
<i>Hyridella</i>										
<i>Latia</i>						R				
Lymnaeidae							R			
<i>Melanopsis</i>		R								
<i>Physa/Physella</i>	R		R			R		VA	A	C
<i>Potamopyrgus</i>	VA	VVA	VA	A	A	VVA	VA	VVA	VA	VA
Sphaeriidae	R						A	R	A	C
CRUSTACEA										
Amphipoda										
Cladocera							VA			
Copepoda	R	R					A			C
Isopoda	R	C		C				R		
Mysid shrimps										
Ostracoda							VA	R	R	
<i>Paracalliope</i>	A	A			C	R	VA		A	R
<i>Paraleptamphopus</i>	R			A						
<i>Paranephrops</i>			R			R			R	
<i>Paranthura</i>		R								
<i>Paratya</i>	A	A	A			R		C	A	A
<i>Phreatogammarus</i>		A								
Talitridae	R	R	R	R				C		R

ACARINA	R		R	C	R		A	C	R	R
ARACHNIDA										
<i>Dolomedes aquaticus</i>			R							
DOBSONFLIES										
<i>Archichauliodes</i>					R	VA				
LACEWINGS										
<i>Kempynus</i>										
DRAGONFLIES										
<i>Antipodochlora</i>								R	R	C
<i>Austroletes</i>										
<i>Hemicordulia</i>										
<i>Ischnura</i>										
<i>Procordulia</i>										
<i>Xanthocnemis</i>	A	R	C				C	A	C	C
tail-less damselflies										
juvenile dragonflies (Anisoptera)										
MAYFLIES										
<i>Acanthophlebia</i>										
<i>Ameletopsis</i>										
<i>Arachnocolus</i>	R									R
<i>Atalophlebioides</i>										
<i>Austroclima</i>				C	R	A				
<i>Austronella</i>										

<i>Coloburiscus</i>				C		A				
<i>Deleatidium</i>					R	VA				
<i>Ichthybotus</i>										
<i>Isothraulus</i>										
<i>Maiulus</i>										
<i>Neozephlebia</i>										
<i>Nesameletus</i>										
<i>Oniscigaster</i>										
<i>Rallidens</i>					R					
<i>Siphlaenigma</i>										
<i>Tepakia</i>	C									
<i>Zephlebia</i>	C		C	A	C	R				
STONEFLIES										
<i>Acroperla</i>										
<i>Austroperla</i>										
<i>Megaleptoperla</i>						R				
<i>Nesoperla</i>										
<i>Spaniocerca</i>										
<i>Stenoperla</i>										
<i>Taraperla</i>										
<i>Zelandobius</i>										
<i>Zelandoperla</i>										
CADDISFLIES										
<i>Alloecentrella</i>										

<i>Aoteapsyche</i>					A	VA				
<i>Beraeoptera</i>						R				
<i>Confluens</i>										
<i>Costachorema</i>										
<i>Cryptobiosella</i>										
<i>Ecnomina</i>										
<i>Helicopsyche</i>										
<i>Hudsonema</i>						C				
<i>Hydrobiosella</i>										
<i>Hydrobiosis</i>					R	C				
<i>Hydrochorema</i>										
<i>Neurochorema</i>										
<i>Oecetis</i>										
Oeconesidae										
<i>Olinga</i>						A				
<i>Orthopsyche</i>				C						
<i>Oxyethira</i>					C	C	R		R	
<i>Paroxyethira</i>										
<i>Plectrocnemia</i>										
<i>Polyplectropus</i>	C	R	R	R			C			
<i>Psilochorema</i>		R		R		R				
<i>Pycnocentria</i>	R			C	R	R				
<i>Pycnocentroides</i>				R	A	VA				
<i>Tiphobiosis</i>										

<i>Triplectides</i>	A	A			R	R		VA	A	VA
<i>Zelandoptila</i>										
<i>Zelolessica</i>										
BEETLES										
<i>Antiporus</i>										
<i>Copelatus</i>										
Elmidae				R	VVA	VA		R		
<i>Enochrus</i>										
Hydraenidae						R				
Hydrophilidae				R						
<i>Hyphydrus</i>										
<i>Liodessus</i>							R			
Ptilodactylidae	R					R				
<i>Rhantus</i>										
Scirtidae	R									
Staphylinidae										
WATER BUGS										
<i>Anisops</i>										
<i>Diaprepocoris</i>										
<i>Mesovelgia</i>										
<i>Microvelia</i>							R	R		
Saldidae										
<i>Sigara</i>							R			
MOTHS										

<i>Hygraula</i>										
TRUE FLIES										
Anthomyiidae (musoids)						R				
<i>Aphrophilia</i>				R						
<i>Austrosimulium</i>				C	R	A				
Ceratopogonidae										
Chironomidae indet.										
<i>Chironomus</i>				R			C	C	R	C
<i>Corynoneura</i>										
Culicidae indet.							A		R	R
Diptera indet.										
Dixidae pupa										
Dolichopodidae										
Empididae						R		R		
Ephydriidae										
Eriopterini										
<i>Harrisius</i>		R						R		
Hexatomini	R									
<i>Limonia</i>										
<i>Lobodimaesa</i>										
<i>Maoridiamesa</i>										
<i>Mischoderus</i>					R	R		R		
<i>Molophilus</i>		R								

Muscidae							C	R		R
<i>Neocurupira</i>										
Blepharicerid										
<i>Neolimnia</i>	R			R				R	R	
<i>Nothodixa</i>										
Orthoclaadiinae				R	R	C	R			R
Orthoclaadiinae sp. A "hi-rise"										
<i>Parochlus</i>										
<i>Paradixa</i>	R	R	R	R			R	C	C	C
<i>Paralimnophila</i>	R							R		
<i>Paucispinigera</i>										
<i>Polypedilum</i>	R			C				R	R	C
Psychodidae				R						
Sarcophagidae										
Stratiomyidae										R
Tabanidae										
Tanypodinae	R		R				A	C	C	C
<i>Tanytarsus</i>						R	R			
Thaumaleidae										
Tipulidae indet.										
<i>Zelandotipula</i>										
COLLEMBOLA		R			R		C			R
Richness	28	18	15	25	23	34	28	27	21	25

Ephem richness	3	0	1	3	4	4	0	0	0	1
Plec richness	0	0	0	0	0	1	0	0	0	0
Tric richness	3	3	1	5	6	10	2	1	2	1
EPT richness	6	3	2	8	10	15	2	1	2	2
% Ephem	10.7%	0.0%	6.7%	12.0%	17.4%	11.8%	0.0%	0.0%	0.0%	4.0%
% Plecoptera	0.0%	0.0%	0.0%	0.0%	0.0%	2.9%	0.0%	0.0%	0.0%	0.0%
% Trichoptera	10.7%	16.7%	6.7%	20.0%	26.1%	29.4%	7.1%	3.7%	9.5%	4.0%
% EPT	21.4%	16.7%	13.3%	32.0%	43.5%	44.1%	7.1%	3.7%	9.5%	8.0%
MCI	101.4	100.0	90.7	98.4	98.3	105.9	76.4	80.0	73.3	80.8
MCI-sb	105.1	97.0	95.5	115.1	94.4	109.8	65.1	85.5	79.3	79.4
SQMCI	4.7	4.2	3.9	5.3	5.7	5.2	3.7	3.9	3.8	4.4
SQMCI-sb	3.5	2.6	2.9	5.7	6.7	4.3	2.9	2.5	2.9	3.9

Appendix 8.5.1.3 F (52-61 of 68 samples): Auckland Regional Council macro invertebrate data (2009 sampling round).

	Eskdale Upper	Mauku @ STP	Okura Reserve	Duck Creek	Ararimu	Motutapu	Kaukapakap a Reference	Dyers (bush)	Dyers (paddock)	Mahurangi @ Trappitt
	FWM073	FWM074	FWM075	FWM076	FWM080	FWM084	FWM086	FWM087	FWM088	FWM089
	Eskdale Upper	Mauku @ STP	Okura Reserve	Duck Creek	Ararimu	Motutapu	Kaukapakap a Reference	Dyers (bush)	Dyers (paddock)	Mahurangi @ Trappitt
	5-Feb-09	12-Feb-09	11-Feb-09	11-Feb-09	3-Feb-09	19-Feb-09	23-Feb-09	11-Feb-09	11-Feb-09	19-Feb-09
	SB	SB	SB	SB	SB	HB	SB	SB	SB	SB
	09073	09074	09075	09076	09080	09084	09086	09087	09088	09089
OLIGOCHAETA	C	A	A	VA	A	A		R	R	C
NEMATODA						R				
NEMATOMORPHA										
NEMERTEA		C			R	C			R	
HYDROIDS		C								
BRYOZOA										
HIRUDINEA										
<i>Alboglossiphonia</i>		R		R		A				
<i>Barbronia</i>										
<i>Placobdella</i>										
PLATYHELMINTHES				C	R	R				
Rhabdocoela		R				R				
MOLLUSCS										

<i>Cucumerunio</i>										
<i>Ferrissia /Gundlachia</i>					R					
<i>Gyraulus</i>										
<i>Hyridella</i>										
<i>Latia</i>					C			C	C	
Lymnaeidae										
<i>Melanopsis</i>										
<i>Physa/Physella</i>		C		VA		C				
<i>Potamopyrgus</i>	A	A	VA	VVA	A	VA	C	VA	VA	C
Sphaeriidae			A	R	C					R
CRUSTACEA										
Amphipoda								C		
Cladocera				R						
Copepoda			R		R					R
Isopoda			R	R				R		R
Mysid shrimps										
Ostracoda		C		VA		C			R	
<i>Paracalliope</i>	A		A		VA	VA	A		C	A
<i>Paraleptamphopus</i>		R	C		C		R		R	C
<i>Paranephrops</i>	R		R				R		R	C
<i>Paranthura</i>										
<i>Paratya</i>	A	R	C		R		C	R	C	
<i>Phreatogammarus</i>		C								
Talitridae			R		R				R	

ACARINA	C	R	R	C		A	R	R	R	C
ARACHNIDA										
<i>Dolomedes aquaticus</i>										
DOBSONFLIES										
<i>Archichauliodes</i>									R	
LACEWINGS										
<i>Kempynus</i>										
DRAGONFLIES										
<i>Antipodochlora</i>	R									
<i>Austroletes</i>				R						
<i>Hemicordulia</i>				C						
<i>Ischnura</i>				R						
<i>Procordulia</i>										
<i>Xanthocnemis</i>	R	C	C	VA	C			R	R	R
tail-less damselflies										
juvenile dragonflies (Anisoptera)										
MAYFLIES										
<i>Acanthophlebia</i>										
<i>Ameletopsis</i>										
<i>Arachnocolus</i>	A		C				R	R		R
<i>Atalophlebioides</i>										
<i>Austroclima</i>							R	R		
<i>Austronella</i>										

<i>Coloburiscus</i>										
<i>Deleatidium</i>								R		
<i>Ichthybotus</i>										
<i>Isothraulus</i>										
<i>Mauiulus</i>										
<i>Neozephebia</i>			R		R		R	C	R	
<i>Nesameletus</i>								R		
<i>Oniscigaster</i>										
<i>Rallidens</i>										
<i>Siphlaenigma</i>										
<i>Tepakia</i>	C		A		A					A
<i>Zephebia</i>	A	C	VA		VA		A	VA	VA	VA
STONEFLIES										
<i>Acroperla</i>										
<i>Austroperla</i>										R
<i>Megaleptoperla</i>								C	R	
<i>Nesoperla</i>										
<i>Spaniocerca</i>										
<i>Stenoperla</i>										
<i>Taraperla</i>										
<i>Zelandobius</i>										R
<i>Zelandoperla</i>										
CADDISFLIES										
<i>Alloecentrella</i>										

<i>Aoteapsyche</i>										
<i>Beraeoptera</i>										
<i>Confluens</i>										
<i>Costachorema</i>										
<i>Cryptobiosella</i>										
<i>Ecnomina</i>										
<i>Helicopsyche</i>										
<i>Hudsonema</i>								C	A	
<i>Hydrobiosella</i>										
<i>Hydrobiosis</i>										
<i>Hydrochorema</i>										
<i>Neurochorema</i>								R		
<i>Oecetis</i>					R			R	R	
Oeconesidae										R
<i>Olinga</i>		R								
<i>Orthopsyche</i>										
<i>Oxyethira</i>		A				A			R	
<i>Paroxyethira</i>										
<i>Plectrocnemia</i>										
<i>Polyplectropus</i>	C	R	A	R	R	R	R	C	C	C
<i>Psilochorema</i>						R		R	R	
<i>Pycnocentria</i>			A		R				R	R
<i>Pycnocentroides</i>								R	A	
<i>Tiphobiosis</i>										

<i>Triplectides</i>	A	C	VA	R	A		R	C	VA	
<i>Zelandoptila</i>	R		R							
<i>Zelolessica</i>								R		
BEETLES										
<i>Antiporus</i>										
<i>Copelatus</i>										
Elmidae						C			R	
<i>Enochrus</i>				C						
Hydraenidae						R				
Hydrophilidae		R				R	R	R	R	
<i>Hyphydrus</i>					R					
<i>Liodessus</i>										
Ptilodactylidae										
<i>Rhantus</i>										
Scirtidae	R							R		
Staphylinidae										
WATER BUGS										
<i>Anisops</i>										
<i>Diaprepocoris</i>										
<i>Mesovelgia</i>						R				
<i>Microvelia</i>		R	C	C		R	R	R	R	
Saldidae										
<i>Sigara</i>				R		R				
MOTHS										

<i>Hygraula</i>										
TRUE FLIES										
Anthomyiidae (musoids)										
<i>Aphrophilia</i>										
<i>Austrosimulium</i>		C			R			R		
Ceratopogonidae										
Chironomidae indet.										
<i>Chironomus</i>				A						
<i>Corynoneura</i>									R	
Culicidae indet.				C						
Diptera indet.										
Dixidae pupa										
Dolichopodidae										
Empididae							R	R		R
Ephydriidae										
Eriopterini										
<i>Harrisius</i>	R	R	R				R	R		
Hexatomini			R							
<i>Limonia</i>						R				
<i>Lobodimaesa</i>										
<i>Maoridiamesa</i>										
<i>Mischoderus</i>										
<i>Molophilus</i>										

Muscidae		R		C		A			R	
<i>Neocurupira</i>										
Blepharicerid										
<i>Neolimnia</i>						R				
<i>Nothodixa</i>										
Orthocladiinae		C	R	C		VA	R	C		
Orthocladiinae sp. A "hi-rise"										
<i>Parochlus</i>										
<i>Paradixa</i>	C		A		C		A	A	A	C
<i>Paralimnophila</i>										
<i>Paucispinigera</i>										
<i>Polypedilum</i>	R	C	C	R	R	C		R	R	R
Psychodidae		R		R						
Sarcophagidae										
Stratiomyidae										
Tabanidae										
Tanypodinae	R	R	C	A	C	A	R	R	R	R
<i>Tanytarsus</i>		R	R	VA		A		R	R	
Thaumaleidae										
Tipulidae indet.										
<i>Zelandotipula</i>										
COLLEMBOLA		R	R					R		R

Richness	19	29	29	27	25	27	19	35	33	23
Ephem richness	3	1	4	0	3	0	4	6	2	3
Plec richness	0	0	0	0	0	0	0	1	1	2
Tric richness	3	4	4	2	4	3	2	8	8	3
EPT richness	6	5	8	2	7	3	6	15	11	8
% Ephem	15.8%	3.4%	13.8%	0.0%	12.0%	0.0%	21.1%	17.1%	6.1%	13.0%
% Plecoptera	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.9%	3.0%	8.7%
% Trichoptera	15.8%	13.8%	13.8%	7.4%	16.0%	11.1%	10.5%	22.9%	24.2%	13.0%
% EPT	31.6%	17.2%	27.6%	7.4%	28.0%	11.1%	31.6%	42.9%	33.3%	34.8%
MCI	111.6	83.4	103.4	77.8	94.4	83.7	108.4	112.6	98.2	108.7
MCI-sb	121.6	84.5	111.9	64.1	101.6	83.2	122.1	117.0	108.4	119.0
SQMCI	5.6	3.2	5.3	3.5	5.4	3.5	5.3	5.4	5.2	6.2
SQMCI-sb	5.8	3.3	5.7	2.3	6.3	3.6	6.8	5.8	5.6	7.6

Appendix 8.5.1.3 G (62-68 of 68 samples): Auckland Regional Council macro invertebrate data (2009 sampling round).

	Tawharanui	Waitangi	Waitangi	Makarau	Makarau	Wairoa Rep 1	Wairoa Rep 2
	FWM090	FWM093A	FWM093B	FWM091A	FWM091B	FWM092A	FWM092B
	Tawharanui	Waitangi	Waitangi	Makarau	Makarau	Wairoa Rep 1	Wairoa Rep 2
	19-Feb-09	19-Mar-09	19-Mar-09	18-Feb-09	18-Feb-09	17/02/2009	17/02/2009
	SB	SB	SB	SB	SB	HB	HB
	09090	09093A	09093B	09091-A	09091-B	09092A	09092B
OLIGOCHAETA	R	R	R	R			
NEMATODA	R					R	R
NEMATOMORPHA							
NEMERTEA		R					
HYDROIDS							
BRYOZOA							
HIRUDINEA							
<i>Alboglossiphonia</i>		R	R	R	C		
<i>Barbronia</i>							
<i>Placobdella</i>							
PLATYHELMINTHES	R	A	A	R	R	R	R
Rhabdocoela					R		
MOLLUSCS							
<i>Cucumerunio</i>							
<i>Ferrissia /Gundlachia</i>		R	C				
<i>Gyraulus</i>							
<i>Hyridella</i>							

<i>Latia</i>				C		C	R
Lymnaeidae			R	R	R		
<i>Melanopsis</i>							
<i>Physa/Physella</i>		C	A	A	R		
<i>Potamopyrgus</i>	A	VVA	VVA	VA	VA	A	A
Sphaeriidae				R	C		
CRUSTACEA							
Amphipoda							
Cladocera				C			
Copepoda	C						
Isopoda	R						
Mysid shrimps							
Ostracoda					R		
<i>Paracalliope</i>	A	VVA	VVA	VA	VA		
<i>Paraleptamphopus</i>	C						
<i>Paranephrops</i>	R					C	C
<i>Paranthura</i>							
<i>Paratya</i>		R		A	A		
<i>Phreatogammarus</i>		R	R				
Talitridae							
ACARINA	C	R	R			R	R
ARACHNIDA							
<i>Dolomedes aquaticus</i>							
DOBSONFLIES							

<i>Archichauliodes</i>						A	A
LACEWINGS							
<i>Kempynus</i>							
DRAGONFLIES							
<i>Antipodochlora</i>							
<i>Austroletes</i>							
<i>Hemicordulia</i>							
<i>Ischnura</i>							
<i>Procordulia</i>							
<i>Xanthocnemis</i>	R	A	A	A	C		
tail-less damselflies							
juvenile dragonflies (Anisoptera)							
MAYFLIES							
<i>Acanthophlebia</i>						R	C
<i>Ameletopsis</i>							R
<i>Arachnocolus</i>	C						
<i>Atalophlebioides</i>							
<i>Austroclima</i>				R	R	C	C
<i>Austronella</i>							
<i>Coloburiscus</i>						VA	VA
<i>Deleatidium</i>						VA	VA
<i>Ichthybotus</i>						C	C
<i>Isothraulus</i>	C						

<i>Mauiulus</i>							
<i>Neozephlebia</i>						R	R
<i>Nesameletus</i>						C	C
<i>Oniscigaster</i>							
<i>Rallidens</i>							
<i>Siphlaenigma</i>							
<i>Tepakia</i>	A						
<i>Zephlebia</i>	A			A	A	A	C
STONEFLIES							
<i>Acroperla</i>							
<i>Austroperla</i>						C	C
<i>Megaleptoperla</i>				R		R	R
<i>Nesoperla</i>							
<i>Spaniocerca</i>						R	R
<i>Stenoperla</i>						C	R
<i>Taraperla</i>							
<i>Zelandobius</i>						R	R
<i>Zelandoperla</i>						R	
CADDISFLIES							
<i>Alloecentrella</i>							
<i>Aoteapsyche</i>		C	C				
<i>Beraeoptera</i>							
<i>Confluens</i>							
<i>Costachorema</i>							R

<i>Cryptobiosella</i>							
<i>Ecnomina</i>							
<i>Helicopsyche</i>						R	R
<i>Hudsonema</i>				C	C	R	
<i>Hydrobiosella</i>						R	R
<i>Hydrobosis</i>						C	C
<i>Hydrochorema</i>						R	
<i>Neurochorema</i>				R	R		
<i>Oecetis</i>							
Oeconesidae							
<i>Olinga</i>						A	A
<i>Orthopsyche</i>						A	VA
<i>Oxyethira</i>		R	C	C	A		
<i>Paroxyethira</i>				R	R		
<i>Plectrocnemia</i>							
<i>Polypsectopus</i>	C			R			
<i>Psilochorema</i>						R	R
<i>Pycnocentria</i>				R	R		R
<i>Pycnocentroides</i>				C	A		
<i>Tiphobiosis</i>							
<i>Triplectides</i>	R			A	A	R	
<i>Zelandoptila</i>							
<i>Zelolessica</i>							
BEETLES							

<i>Antiporus</i>							
<i>Copelatus</i>							
Elmidae		R		R	A	A	C
<i>Enochrus</i>							
Hydraenidae						C	C
Hydrophilidae							
<i>Hyphydrus</i>							
<i>Liodessus</i>							
Ptilodactylidae						C	C
<i>Rhantus</i>							
Scirtidae	R						
Staphylinidae							
WATER BUGS							
<i>Anisops</i>							
<i>Diaprepocoris</i>							
<i>Mesovelia</i>							
<i>Microvelia</i>	R		R				
Saldidae							
<i>Sigara</i>							
MOTHS							
<i>Hygraula</i>		C					
TRUE FLIES							
Anthomyiidae (muscids)							
<i>Aphrophilia</i>						R	R

<i>Austrosimulium</i>		VA	VA	R	C	R	C
Ceratopogonidae	R						
Chironomidae indet.							
<i>Chironomus</i>							
<i>Corynoneura</i>							
Culicidae indet.							
Diptera indet.							
Dixidae pupa							
Dolichopodidae							
Empididae							R
Ephydriidae							
Eriopterini							
<i>Harrisius</i>		A	C				
Hexatomini						R	
<i>Limonia</i>						R	
<i>Lobodimaesa</i>							
<i>Maoridiamesa</i>							
<i>Mischoderus</i>							
<i>Molophilus</i>							
Muscidae			C		R		
<i>Neocurupira</i> Blepharicerid							
<i>Neolimnia</i>							
<i>Nothodixa</i>							
Orthocladiinae			C	R	C	R	R

Orthoclaadiinae sp. A "hi-rise"							
<i>Parochlus</i>							
<i>Paradixa</i>	A			R		R	
<i>Paralimnophila</i>							
<i>Paucispinigera</i>							
<i>Polypedilum</i>	C				R	C	C
Psychodidae							R
Sarcophagidae							
Stratiomyidae				R			
Tabanidae							R
Tanypodinae	C			R	C	R	
<i>Tanytarsus</i>				C	A	R	C
Thaumaleidae							
Tipulidae indet.							
<i>Zelandotipula</i>							
COLLEMBOLA	R			R		R	
Richness	24	18	18	31	27	43	40
Ephem richness	4	0	0	2	2	8	9
Plec richness	0	0	0	1	0	6	5
Tric richness	2	2	2	8	7	9	8
EPT richness	6	2	2	11	9	23	22
% Ephem	16.7%	0.0%	0.0%	6.5%	7.4%	18.6%	22.5%
% Plecoptera	0.0%	0.0%	0.0%	3.2%	0.0%	14.0%	12.5%
% Trichoptera	8.3%	11.1%	11.1%	25.8%	25.9%	20.9%	20.0%

% EPT	25.0%	11.1%	11.1%	35.5%	33.3%	53.5%	55.0%
MCI	103.3	77.8	72.2	92.3	84.4	129.8	127.0
MCI-sb	111.3	64.0	60.3	88.4	78.1	136.7	136.4
SQMCI	5.6	4.4	4.3	4.6	4.5	7.7	7.9
SQMCI-sb	6.3	3.7	3.6	3.9	4.2	6.9	6.9

8.5.1.4 Water quality data for the stream sites considered in this study

Table 8.4.1.4: Water quality data (February 2010) for stream sites evaluated for bacterial communities analyses as obtained from the ARC database.

STATION	STATION NAME	Oxygen Reductn Potential (REDOX)	Total Suspended Solids mg/l	Nitrate + nitrite as N - total (mg/L)	Ammonia as N - total (mg/L) (NH3+NH4)	TKN - calc	Total N (lab)	DO ppm	Total Phosphorus as P (Milligrams/Litre)
44603	Cascade Stream	29	2.4	0.013	0.007	0.267	0.28	10.73	0.034
45415	Kaukapakapa @Taylors	112	14	0.077	0.034	0.533	0.61	6.68	0.076
45313	Kumeu River	42	8.8	0.178	0.027	0.602	0.78	6.94	0.065
7830	Lucas Creek	-4	5.8	0.078	0.037	0.472	0.55	6.87	0.039
6811	Mahurangi River FHQ	30	15	0.117	0.033	0.503	0.62	9.37	0.031
6804	Mahurangi River WS	64	8.6	0.033	0.019	0.447	0.48	8.45	0.052
45505	Makarau @ Railway	41	13	0.079	0.026	0.561	0.64	9.07	0.064
6604	Matakana River	78	6.6	0.066	0.018	0.494	0.56	8.08	0.064
43829	Ngakaroa Stream	11	1.3	1.77	0.07	0.83	2.6	7.73	0.017
8110	Oakley Creek	-3	3.4	1.08	0.023	0.32	1.4	8.14	0.048
7502	Okura Creek	43	12	0.376	2.75	4.324	4.7	6.22	0.619
7904	Opanuku Stream	6	6.4	0.054	0.024	0.496	0.55	9.56	0.046
8219	Otaki Creek	-21	31	0.473	0.866	1.927	2.4	4.7	0.223
8214	Otara Ck East Tamaki	-52	8.3	0.274	0.007	0.646	0.92	13.03	0.046
8205	Otara Ck Kennel Hill	-25	3.2	0.274	0.067	0.666	0.94	5.49	0.066

7811	Oteha Stream	-21	2	0.121	0.054	0.459	0.58	5.16	0.036
8217	Pakuranga Ck Botany	-33	5.2	0.718	0.022	0.682	1.4	13.64	0.071
8215	Pakuranga Ck Greenmt	-8	14	0.736	0.307	0.764	1.5	4.69	0.13
43856	Papakura Stream	14	2	0.043	0.038	0.497	0.54	8.32	0.077
43807	Puhinui Stream	-4	8.4	0.232	0.016	0.428	0.66	9.66	0.046
45373	Riverhead Stream	29	5.8	0.06	0.017	0.42	0.48	7.1	0.028
7506	Vaughn Stream	21	9.2	0.034	0.094	1.266	1.3	5.8	0.055
8516	Wairoa River	17	8.4	0.087	0.016	0.343	0.43	9.24	0.054
8568	Wairoa trib @ Caitchons	33	4.1	0.043	0.013	0.137	0.18	10.91	0.045
43601	Waitangi Falls Br.	30	1.7	0.052	0.012	0.288	0.34	3.88	0.017
7206	West Hoe Stream	16	4.3	0.004	0.021	0.286	0.29	8.98	0.021

8.5.2 Environment Waikato

8.5.2.1 Sample storage: Stream identifier codes

Table 8.5.2.1: Samples were labeled with stream identifier codes and stored.

	STREAM	ID - Env Waikato	SHORT CODE LABEL	STREAM IDENTIFIER #
1	Tributary of Mangatia stream	467-7	MSB1	WK10_MSB1
2			MSB2	WK10_MSB2
3			MSB3	WK10_MSB3
4			MSB4	WK10_MSB4
5			MSB5	WK10_MSB5
6	Hospital stream, Normandy Ave	NA	HOS1	WK10_HOS1
7			HOS2	WK10_HOS2
8			HOS3	WK10_HOS3
9			HOS4	WK10_HOS4
10			HOS5	WK10_HOS5
11	Mangakotutukutuku stream, peacocks	NA	PCK1	WK10_PCK1
12			PCK2	WK10_PCK2
13			PCK3	WK10_PCK3
14			PCK4	WK10_PCK4
15			PCK5	WK10_PCK5
16	Unnamed tributary of Naike stream	572-4	NK1	WK10_NK1
17			NK2	WK10_NK2
18			NK3	WK10_NK3
19			NK4	WK10_NK4
20			NK5	WK10_NK5
21	Waiwawa Coromandel	1257-4	WW1	WK10_WW1
22			WW2	WK10_WW2

23			WW3	WK10_WW3
24			WW4	WK10_WW4
25			WW5	WK10_WW5
26	Hiruwai stream	195-1	HW1	WK10_HW1
27			HW2	WK10_HW2
28			HW3	WK10_HW3
29			HW4	WK10_HW4
30			HW5	WK10_HW5
31	Pohue	783-2	PHE1	WK10_PHE1
32			PHE2	WK10_PHE2
33			PHE3	WK10_PHE3
34			PHE4	WK10_PHE4
35			PHE5	WK10_PHE5
36	Taraporiki Coromandel	958-2	TRP1	WK10_TRP1
37			TRP2	WK10_TRP2
38			TRP3	WK10_TRP3
39			TRP4	WK10_TRP4
40			TRP5	WK10_TRP5
41	Waiomu stream	1175-10	WMU1	WK10_WMU1
42			WMU2	WK10_WMU2
43			WMU3	WK10_WMU3
44			WMU4	WK10_WMU4
45			WMU5	WK10_WMU5
46	Whangaroa, Coromandel	1307-7	WGR1	WK10_WGR1
47			WGR2	WK10_WGR2
48			WGR3	WK10_WGR3
49			WGR4	WK10_WGR4
50			WGR5	WK10_WGR5
51	Kaurianga river, Coromandel	234-28	KAU1	WK10_KAU1
52			KAU2	WK10_KAU2
53			KAU3	WK10_KAU3
54			KAU4	WK10_KAU4

55			KAU5	WK10_KAU5
56	Mangakotutukutuku TL trib	NA	MTB1	WK10_MTB1
57			MTB2	WK10_MTB2
58			MTB3	WK10_MTB3
59			MTB4	WK10_MTB4
60			MTB5	WK10_MTB5
61	Unnamed tributary of Okupata stream	635-2-088	OKU1	WK10_OKU1
62			OKU2	WK10_OKU2
63			OKU3	WK10_OKU3
64			OKU4	WK10_OKU4
65			OKU5	WK10_OKU5
66	Ahirua stream, Coromandel	9.4	AHR1	WK10_AHR1
67			AHR2	WK10_AHR2
68			AHR3	WK10_AHR3
69			AHR4	WK10_AHR4
70			AHR5	WK10_AHR5
71	Karaka stream, Coromandel	1307-11	KRK1	WK10_KRK1
72			KRK2	WK10_KRK2
73			KRK3	WK10_KRK3
74			KRK4	WK10_KRK4
75			KRK5	WK10_KRK5
76	Tararu Coromandel	962-4	TRU1	WK10_TRU1
77			TRU2	WK10_TRU2
78			TRU3	WK10_TRU3
79			TRU4	WK10_TRU4
80			TRU5	WK10_TRU5
81	Mangarika stream, Te tahi road, Pirangita	477.14	PIR1	WK10_PIR1
82			PIR2	WK10_PIR2
83			PIR3	WK10_PIR3
84			PIR4	WK10_PIR4

85			PIR5	WK10_PIR5
86	Oamaru stream	NA	OAM1	WK10_OAM1
87			OAM2	WK10_OAM2
88			OAM3	WK10_OAM3
89			OAM4	WK10_OAM4
90			OAM5	WK10_OAM5
91	Wainui, Raglan	1172-6	WN1	WK10_WN1
92			WN2	WK10_WN2
93			WN3	WK10_WN3
94			WN4	WK10_WN4
95			WN5	WK10_WN5
96	Gibbons creek, Hamilton	NA	GB1	WK10_GB1
97			GB2	WK10_GB2
98			GB3	WK10_GB3
99			GB4	WK10_GB4
100			GB5	WK10_GB5
101	Mangakotutukutuku TL	NA	MTL1	WK10_MTL1
102			MTL2	WK10_MTL2
103			MTL3	WK10_MTL3
104			MTL4	WK10_MTL4
105			MTL5	WK10_MTL5
106	Paraunahi stream Coromandel	735-2	PRN1	WK10_PRN1
107			PRN2	WK10_PRN2
108			PRN3	WK10_PRN3
109			PRN4	WK10_PRN4
110			PRN5	WK10_PRN5
111	Pirongia west road, Omanuwaituia	1414-1	OMW1	WK10_OMW1
112			OMW2	WK10_OMW2
113			OMW3	WK10_OMW3
114			OMW4	WK10_OMW4
115			OMW5	WK10_OMW5

116	Mangatu, Coromandel	474-2	MTU1	WK10_MTU1
117			MTU2	WK10_MTU2
118			MTU3	WK10_MTU3
119			MTU4	WK10_MTU4
120			MTU5	WK10_MTU5
121	Whakakai, Whataulata	1968-1	WKK1	WK10_WKK1
122			WKK2	WK10_WKK2
123			WKK3	WK10_WKK3
124			WKK4	WK10_WKK4
125			WKK5	WK10_WKK5
126	Mangakotutukutuku, Te Anau	NA	TNU1	WK10_TNU1
127			TNU2	WK10_TNU2
128			TNU3	WK10_TNU3
129			TNU4	WK10_TNU4
130			TNU5	WK10_TNU5
131	Te Rekereke	1513-3	TRK1	WK10_TRK1
132			TRK2	WK10_TRK2
133			TRK3	WK10_TRK3
134			TRK4	WK10_TRK4
135			TRK5	WK10_TRK5
136	Waikato river, Victoria	NA	VIC1	WK10_VIC1
137			VIC2	WK10_VIC2
138			VIC3	WK10_VIC3
139			VIC4	WK10_VIC4
140			VIC5	WK10_VIC5
141	Mangatia stream	1862-4	MTA1	WK10_MTA1
142			MTA2	WK10_MTA2
143			MTA3	WK10_MTA3
144			MTA4	WK10_MTA4
145			MTA5	WK10_MTA5
146	Waitawhiriwhiri, Edgumbe park	NA	WTW1	WK10_WTW1

147			WTW2	WK10_WTW2
148			WTW3	WK10_WTW3
149			WTW4	WK10_WTW4
150			WTW5	WK10_WTW5
151	Waikato river Swarbicks	NA	SWB1	WK10_SWB1
152			SWB2	WK10_SWB2
153			SWB3	WK10_SWB3
154			SWB4	WK10_SWB4
155			SWB5	WK10_SWB5
156	Waikato river-Pukete boat ramp	NA	PKT1	WK10_PKT1
157			PKT2	WK10_PKT2
158			PKT3	WK10_PKT3
159			PKT4	WK10_PKT4
160			PKT5	WK10_PKT5
161	Unnamed tributary -Waitetuna river	1247-41	WTT1	WK10_WTT1
162			WTT2	WK10_WTT2
163			WTT3	WK10_WTT3
164			WTT4	WK10_WTT4
165			WTT5	WK10_WTT5
166	Kirikiroa at River road	NA	KIR1	WK10_KIR1
167			KIR2	WK10_KIR2
168			KIR3	WK10_KIR3
169			KIR4	WK10_KIR4
170			KIR5	WK10_KIR5
171	Manurimu stream	539-1	MNR1	WK10_MNR1
172			MNR2	WK10_MNR2
173			MNR3	WK10_MNR3
174			MNR4	WK10_MNR4
175			MNR5	WK10_MNR5
176	Bankwood, Danny Park	NA	BKW1	WK10_BKW1
177			BKW2	WK10_BKW2

178			BKW3	WK10_BKW3
179			BKW4	WK10_BKW4
180			BKW5	WK10_BKW5
181	Waikuku (Te kauri)	1965-1	WK1	WK10_WK1
182			WK2	WK10_WK2
183			WK3	WK10_WK3
184			WK4	WK10_WK4
185			WK5	WK10_WK5

8.5.2.2 Catchment land-use data

Table 8.4.2.2 A: Catchment landuse data (Environment Waikato database) used for classifying samples.

	SITE	REACH_M2	UPSTRM_M2	U Natural Forest	U Planted Forest - Pre 1990	U Post 1989 Forest	U Grassland - With woody biomass	U Grassland - High producing	U Grassland - Low producing	U Cropland - Orchards and vineyards (perennial)	U Cropland - Annual	U Wetland - Open water	U Wetland - Vegetated non forest	U Settlements or built-up area
3017999	539_1	479804.6	2613302	1403434	0	3299.808	0	712043	436142.9	0	0	0	42075.79	16306
3017533	1968_1	487040.7	3094165	3088707	0	2501.744	0	2956	0	0	0	0	0	0
3019516	1247_41	478034.8	2271358	181116.3	0	591747.6	157136.1	366285	974596.5	0	0	476	0	0
3010411	1862_4	910894.6	9125193	957800.9	20702.11	20252.29	238482.7	6259022	1628933	0	0	0	0	0
3010319		188987.5	9278580	1484942	99220.58	710203.4	674055.3	5720244	578271.9	0	0	11642	0	0
3003159	1175_10	856379.6	9557273	9437161	0	0	0	0	29731.83	0	0	0	0	90380
3003068	783_2	1664127	3493963	3427767	0	0	0	0	32253.33	0	0	0	0	33903
3003562	234_28	459322.4	13601532	13601532	0	0	0	0	0	0	0	0	0	0
3004096	962_4	743835.6	15406546	15047039	0	10131.13	26115.88	0	189338.7	0	0	0	0	133259
3018358	Mangakotukutuku TL	1347984	16916745	110563.9	0	26158.73	54071.46	13683676	171988.4	66940	0	0	0	2803346
3018358	Mangakotukutuku TR trib	1347984	16916745	110563.9	0	26158.73	54071.46	13683676	171988.4	66940	0	0	0	2803346
3018334	Mangakotukutuku @ Peakockes 398_13	37819.86	26599537	610397	31967.15	26158.73	119278.8	19777351	994147.9	248077	59659	31566	0	4700934
3018466	Mangakotukutuku @ Te Anau	583501.5	4068312	127908.2	0	0	4442.371	2607073	5.175815	0	59659	28122	0	1241102
3018155	Hospital Stream Normandy ave	451127.8	451127.8	11071.18	0	0	0	0	0	0	0	782	0	439275
3017804	Waikato River @	701451.1	8.32E+09	1.72E+09	2.02E+09	1.26E+08	2.08E+08	1.81E+09	1.45E+09	6449862	37119452	6.9E+08	27706725	69612626

	Victoria St													
3017743	Gibbons Creek	1135479	1135479	52592.83	0	0	0	0	0	0	0	0	0	1082886
3016924	Kirikiroa @ River Rd	451112.6	12334262	448292.6	614.3075	0	37804.99	6992272	0	0	495511	0	0	4359767
3016448	Waikato River @ Pukete boat ramp	308834.6	8.39E+09	1.72E+09	2.02E+09	1.26E+08	2.08E+08	1.83E+09	1.45E+09	6553256	37614963	6.91E+08	27706725	1.11E+08
3017487	Waitawhiriwhiri @ Edgecombe park	1824270	22227010	110929.7	134159	0	59101.01	9986975	199018.3	0	0	524858	0	11211969
3017058	Bankwood stm @ Donny park	1483015	2251994	174454.3	0	0	0	0	12415.4	0	0	17064	0	2048060
3017057	Waikato R – Swarbicks landing	366473.7	8.37E+09	1.72E+09	2.02E+09	1.26E+08	2.08E+08	1.82E+09	1.45E+09	6553256	37119452	6.91E+08	27706725	1.01E+08
3025785	1967_2	330404.8	9609565	5826102	28133.86	0	75908.78	116471	3562949	0	0	0	0	0
3022752	1414_1	1321635	1321635	1321635	0	0	0	0	0	0	0	0	0	0
3022868	477_14	1091227	7384537	7049303	332665.4	2568.023	0	0	0	0	0	0	0	0
3019330	1513_3	1323056	1323056	1013504	0	0	0	309553	0	0	0	0	0	0
3018209	1172_6	2991819	3899074	2721574	9346.777	11251.04	140884.5	782448	185109.6	0	0	0	0	48460
3023732	1965_1	1247731	1247731	958170.1	1187.291	0	0	0	288373.3	0	0	0	0	0
3023487	635_2	879577.5	879577.5	135555.2	0	0	0	281574	462448.3	0	0	0	0	0
3015549	467_7	1063868	1063868	0	0	0	0	945085	118783.3	0	0	0	0	0
3012751	572_4	513950.3	12581386	535863.2	2850.294	445976.1	72725.45	11488200	13335.6	0	0	4054	0	0
3000561	474_2	826554	2833491	2735857	0	0	0	86396	11236.95	0	0	0	0	0
3001274	958_2	618689.9	2891692	1759879	65545.54	452182.6	34432.74	868	578784.1	0	0	0	0	0
3002569	1257_4	684446.8	57084235	56570367	0	19987.03	75371.01	51209	333692.8	0	0	33608	0	0
3001964	735_2	889584.3	889584.3	425591.4	0	5256.275	74836.17	0	383592.5	0	0	0	0	0
3000999	1307_11	440295.9	5797777	4631540	606106.6	8207.714	0	401272	60111.26	0	0	0	0	11297

3000952	1307_7	515925.1	8721226	7192206	123011	48096.93	44.01558	796271	74124.41	0	0	0	0	487472
3000340	9_4	911108.3	911108.3	891174.1	0	0	1396.48	0	7472.569	0	0	0	11065.16	0

Table 8.5.2.2 B: Land-use data (Environment Waikato database) based on Table 8.5.2.2A converted to a % of a total

NZREACH	SITE	U Natural Forest %	U Planted Forest - Pre 1990 %	U Post 1989 Forest %	U Grassland - With woody biomass %	U Grassland - High producing %	U Grassland - Low producing %	U Cropland - Orchards and vineyards (perennial) %	U Cropland - Annual %	U Wetland - Open water %	U Wetland - Vegetated non forest %	U Settlements or built-up area %	U Other %
3017999	539_1	53.70348	0	0.12627	0	27	16.68934	0	0	0	1.610062	1	0
3017533	1968_1	99.82361	0	8.09E-02	0	0	0	0	0	0	0	0	0
3019516	1247_41	7.973924	0	26.05259	6.918157	16	42.9081	0	0	0	0	0	0
3010411	1862_4	10.49623	0.226868	0.221938	2.613454	69	17.85095	0	0	0	0	0	0
3010319		16.00398	1.069351	7.654225	7.264639	62	6.232332	0	0	0	0	0	0
3003159	1175_10	98.74324	0	0	0	0	0.311091	0	0	0	0	1	0
3003068	783_2	98.10541	0	0	0	0	0.923116	0	0	0	0	1	0
3003562	234_28	100	0	0	0	0	0	0	0	0	0	0	0
3004096	962_4	97.66653	0	6.58E-02	0.169512	0	1.22895	0	0	0	0	1	0
3018358	Mangakotukutuku TL	0.653577	0	0.154632	0.319633	81	1.016675	0	0	0	0	17	0
3018358	Mangakotukutuku TR trib	0.653577	0	0.154632	0.319633	81	1.016675	0	0	0	0	17	0

3018334	Mangakotukutuku @ Peakockes 398_13	2.294765	0.120179	9.83E-02	0.448424	74	3.737463	1	0	0	0	18	0
3018466	Mangakotukutuku @ Te Anau	3.144012	0	0	0.109194	64	1.27E-04	0	1	1	0	31	0
3018155	Hospital Stream Normandy ave	2.454112	0	0	0	0	0	0	0	0	0	97	0
3017804	Waikato River @ Victoria St	20.62746	24.30705	1.511347	2.501057	22	17.40208	0	0	8	0.333055	1	1
3017743	Gibbons Creek	4.631774	0	0	0	0	0	0	0	0	0	95	0
3016924	Kirikiroa @ River Rd	3.634531	4.98E-03	0	0.306504	57	0	0	4	0	0	35	0
3016448	Waikato River @ Pukete boat ramp	20.46802	24.10745	1.498806	2.482937	22	17.27056	0	0	8	0.330292	1	1
3017487	Waitawhiriwhiri @ Edgecombe park	0.499076	0.603585	0	0.265897	45	0.895389	0	0	2	0	50	0
3017058	Bankwood stm @ Donny park	7.746658	0	0	0	0	0.551307	0	0	1	0	91	0
3017057	Waikato R @ Swarbricks landing	20.51144	24.16858	1.502607	2.487784	22	17.30977	0	0	8	0.331129	1	1
3025785	1967_2	60.62816	0.292769	0	0.789929	1	37.07711	0	0	0	0	0	0
3022752	1414_1	100	0	0	0	0	0	0	0	0	0	0	0
3022868	477_14	95.46033	4.504892	3.48E-02	0	0	0	0	0	0	0	0	0
3019330	1513_3	76.60322	0	0	0	23	0	0	0	0	0	0	0
3018209	1172_6	69.80051	0.239718	0.288557	3.61328	20	4.747527	0	0	0	0	1	0
3023732	1965_1	76.79302	9.52E-02	0	0	0	23.11182	0	0	0	0	0	0

3023487	635_2	15.41139	0	0	0	32	52.57619	0	0	0	0	0	0
3015549	467_7	0	0	0	0	89	11.16523	0	0	0	0	0	0
3012751	572_4	4.259174	2.27E-02	3.544729	0.57804	91	0.105995	0	0	0	0	0	0
3000561	474_2	96.55431	0	0	0	3	0.396576	0	0	0	0	0	0
3001274	958_2	60.85985	2.266685	15.6373	1.190747	0	20.01541	0	0	0	0	0	0
3002569	1257_4	99.09981	0	3.50E-02	0.132035	0	0.584562	0	0	0	0	0	0
3001964	735_2	47.84161	0	0.590869	8.412487	0	43.12042	0	0	0	0	0	0
3000999	1307_11	79.88476	10.45412	0.141567	0	7	1.036798	0	0	0	0	0	1
3000952	1307_7	82.46784	1.410478	0.551493	5.05E-04	9	0.849931	0	0	0	0	6	0
3000340	9_4	97.81209	0	0	0.153273	0	0.820163	0	0	0	1.214473	0	0

8.5.2.3 Environment Waikato: Macroinvertebrate data from the 2009 sampling round.

Table 8.5.2.3 (A): Waikato Regional Council: 1-13 of 26 samples assessed for macro invertebrate communities during the 2009 sampling round.

Site code	539_1	1968_1	1247_41	1862_4	195_1	1175_10	783_2	234_28	962_4	398_13	1967_2	1414_1	477_14
EPHEMEROPTERA (Mayflies)													
Acanthophlebia	0	0	1	0	0	0	0	0	0	0	0.5	0	0
Ameletopsis	0	0	0	0	0	0.5	0	0	1	0	0	0	0
Arachnocolus	0	0	0	0	0	0	0	0	0	0	0	0	0
Atalophlebioides	0	0	0	0	0	0	0	0	0	0	0	0	0
Austroclima	0	0	13	0	2	0	1	0	0	10	2	24	0

Austronella	0	0	0	0	0	0	0	0	0	0	0	0	0
Coloburiscus	0	71	17	0	0.5	24	29	26	0	0	27	38	48
Deleatidium	117	50	49	0.5	34	10	23	36	20	0	78	36	47
Icthyotus	0	1	0	0	0	1	0	0	0	0	0	0	0
Isothraulus	0	0	0	0	0	0	0	0	0	0	0	0	0
Maiulus	0	0	0	0	0	0	0	0	0	0	0	0	0
Neozephlebia	0	0	3	0	0	0	0	0	0	9	0	0	0
Nesamaletus	0	0.5	0	0	0	0	17	0	0	0	0.5	4	9
Oniscigaster	0	0	0	0	0	0	0	0	0	0	0	0	0
Rallidens	0	0	0	0	0	0	0	0	0	0	0	0	0
Siphlaenigma	0	0	0	0	0	0	0	0	0	0	0	0	0
Tepakia	0	0	0	0	0	0	0	0	0	2	0	0	0
Zephlebia	0	3	13	0	0	0	2	0	0	18	0	8	0
Cryophlebia	0	0	0	0	0	0	0	0	0	0	0	0	0
PLECOPTERA (Stonefly)													
Acroperla	0	0	0	0	0	0	0	0	0	0	0	0	0
Austroperla	0	2	0	0	0	0	0	1	0	0	0	6	1
Megaleptoperla	0	4	2	0	0	1	0	0	0	0	0	0	0
Spaniocera	0	0	0	0	0	0	0	0	0	0	0	0	0

Stenoperla	0	2	0	0	0	0	0	0	1	0	0	0	2
Zelandobius	0	0	0	0	0	1	2	0	1	0	0	54	3
Zelandoperla	0	0	0	0	0	1	1	2	0	0	4	8	45
Cristoperla	0	0	0	0	0	0	0	0	0	0	0	0	0
Taraperla	0	0	0	0	0	0	0	0	0	0	0	0	0
Notonemouridae	0	0	0	0	0	0	0	0	0	0	0	0	0
Nesoperla	0	0	0	0	0	0	0	0	0	0	0	0	0
TRICOPTERA (Caddisfly)													
Aoteapsyche	6	2	2	0	17	80	33	54	2	0	32	1	3
Beraeoptera	0	0	0	0	0	0	0	0	0	0	9	0	27
Costachorema	0	0	0	0	1	1	0.5	0	0	0	0	0.5	0
Ecnomidae	0	0	0	0	0	0	0	0	0	0	0	0	0
Edpercivalia	0	0	0	0	0	0	0	0	0	0	0	0	0
Helicopsyche	0	1	0	0	2	0	0	0	0	0	0	0	0
Hudsonema	0.5	0	1	0	0.5	0	0	0	0	0	0	0	0
Hydrobiosella	0	1	0	0	0	0	0	0	0	0	0	3	0
Hydrobiosis	2	1	3	0	2	1	3	2	5	2	1	0	1

Hydrochorema	0	0	0	0	0	0	0	0	0	0	0	0	0
Neurochorema	0	0	0	0	0	2	1	0	0	0	0	0	0
Oecetis	0	0	0	0	0	0	0	0	0	0	0	0	0
Oeconesus	0	0	0	0	0	0	0	0	0	0	0	0	0
Olinga	6	4	17	0	1	0	0	5	0	0	5	0	4
Orthopsyche	0	32	0	0	0	0	0	0	1	0	0	20	8
Oxyethira	0	0	0.5	2	0	41	1	37	0	24	0	0	0
Paroxyethira	0	0	0	0.5	0	0	0	0	0	0	0	0	0
Polypsectopus	0	0	0	0	0	0	0	0	0	0	0	0	0
Psilochorema	2	0	2	0.5	0	0	0	0	0	0.5	0	0	0.5
Pycnocentrella	0	0	0	0	0	0	0	0	0	0	0	0	0
Pycnocentria	0	0	7	0	0	0	0	0	0	4	4	0	1
Pycnocentrodes	14	0	3	1	71	3	3	0	0	0	4	0	0
Tiphobiosis	0	0	0	0	0	0	0	0	0	0	0	0	0
Triplectides	0	0	0.5	0	0	0	0	0	0	1	0	0	0
Zelolessica	0	0	0	0	0	0	0	0	0	0	0	0	0
Confluens	0	0	0	0	0	0	0	0	0	0	0	0	0
Plectrocnemia	0	0	0	0	0	0	0	0	0	0	0	0	0
Alloecentrella	0	0	0	0	0	0	0	0	0	0	0	0	0
Rakiura	0	0	0	0	0	0	0	0	0	0	0	0	0

Philorheithrus	0	0	0	0	0	0	0	0	0	0	0	0	0
MEGALOPTERA (Dobsonfly)													
Archichauliodes	1	9	6	0	2	2	4	0.5	3	0	2	0	3
NEUROPTERA (Lacewing)													
Kempynus	0	0	0	0	0	0	0	0	0	0	0	0	0
HEMIPTERA (Waterbugs)													
Anisops	0	0	0	0	0	0	0	0	0	0	0	0	0
Microvelia	0	0	0	2	0	0	0	0	0	1	0	0	0
Sigara	0	0	0	0	0	0	0	0	0	0	0	0	0
Diaprepocoris	0	0	0	0	0	0	0	0	0	0	0	0	0
Mesoveliid	0	0	0	0	0	0	0	0	0	0	0	0	0
Hydrometra	0	0	0	0	0	0	0	0	0	0	0	0	0
Saldidae	0	0	0	0	0	0	0	0	0	0	0	0	0
COLEOPTERA (Beetles)													
Antiporus	0	0	0	0	0	0	0	0	0	0	0	0	0
Dytiscidae	0	0	0	0	0	0	0	0	0	0	0	0	0
Elmidae	62	15	41	0.5	8	1	0.5	5	0	0	41	3	6

Hydraenidae	1	13	15	0	0.5	0	0	0	0	0	0	5	2
Hydrophilidae	0	0	0	0	0	0	0	0	0	0	0	0.5	0
Ptilodactylidae	0	0	0	0	0	0	0	0	0	0	0	0	0
Rhantus	0	0	0	0	0	0	0	0	0	0	0	0	0
Scirtidae	0	0	1	0	0	0	0	0	0	0	0	0	0
Liodessus	0	0	0	0	0	0	0	0	0	0	0	0	0
Curclionidae	0	0	0	0	0	0	0	0	0	0	0	0	0
Onychohydrus	0	0	0	0	0	0	0	0	0	0	0	0	0
DIPTERA (Two winged flies)													
Aphrophila	0	0	0.5	0	7	0	0	18	0	0	1	1	7
Austrosimulium	18	0	2	3	2	0	0	0	0	0	0.5	0	0
Ceratopogonidae	0	0	0	0	0	0	0	0	0	0	0	0	0
Culex	0	0	0	0	0	0	0	0	0	0	0	0	0
Empididae	0	0	0	0	0	0	2	1	0	1	0	0	0
Ephydriidae	0	0	0	0	0	0	0	0	0	0	0	0	0
Eriopterini	2	0	1	0	0	0	0	0	0	0	0.5	0	0
Hexatomini	0	0	1	0	0	0	0	0	0	0	0	0	0
Limonia	0	0	0	0	0	0	0	0	0	0	0	0	0
Muscidae	1	0	0	0	1	0.5	0	1	0	0	0	0	0

Neocurupira	0	0	0	0	0	0	0	0	0	0	0	0	1	9
Paradixa	0	0	2	0.5	0	0	0	0	0	0	0	0	0	0
Peritheates	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sciomyzidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tabanidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tanyderidae	0	0	0	0	0	0	0	0	0	4	0	0	0	0
Zelandotipula	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Psychodidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chironomidae orthoclads	1	0	0	1	8	10	4	13	10	0	0	0	0	1
Chironomidae Maoridiamesa	0	0	0	0	1	2	6	5	0	0	0	0	0	0
Chironomidae tanytarsini	0	3	0	0	2	1	11	0	0	0	0	0	1	0
Chironomidae tanypodinae	0.5	0	0	0.5	0	0	0	0	0	0	0	0	0	1
Chironomidae Chironomus	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Chironomidae podomini	0	0	0	0	0	0	0	0	0	0	0	0	0
Chironomidae Stictocladius	0	0	0	0	0	0	0	0	0	0	0	0	0
Chironomidae (unidentified)	0	0	0	0	0	0	0	0	0	0	0	0	0
Chironomidae Harrisius	0	0	0	0	0	0	0	0	0	0	0	0	0
Chironomidae Polypedilum	1	0	0	0	0	0	1	0	2	1	0	3	1
Chironomidae lobodiamesa	0	0	0	0	0	0	0	0	0	0	0	0	0
Paralimnophila	0	0	0	0.5	0	0	0	0	0	1	0	0	0
Nothodixa	0	0	0	0	0	0	0	0	0	0	0	0	0
Stratiomyid	0	0	0	0	0	0	0	0	0	0	0	0	0
Molophilus	0	0	0	0	0	0	0	0	0	1	0	0	0
Thaumaleidae	0	0	0	0	0	0	0	0	0	0	0	0	0
ODONATA (Damselflies & Dragonflies)													

Antipodochlora	0	0	0	0	0	0	0	0	0	0	0	0	0
Austrolestes	0	0	0	0	0	0	0	0	0	0	0	0	0
Diplacodes	0	0	0	0	0	0	0	0	0	0	0	0	0
Hemicordulia	0	0	0	0	0	0	0	0	0	0	0	0	0
Ischnura	0	0	0	0	0	0	0	0	0	0	0	0	0
Procordulia	0	0	0	0	0	0	0	0	0	0	0	0	0
Xanthocnemis	0	0	0	0	0	0	0	0	0	0	0	0	0
Aeshna	0	0	0	0	0	0	0	0	0	0	0	0	0
MOLLUSCA (Snails)													
Ferrisia	1	0	0	0	1	0	2	0	0	0	0	0	0
Gyraulus	0	0	0	0	0	0	0	0	0	0	0	0	0
Latia	0	0	0	0	0	0	0	0	0	0	0	0	0.5
Lymnaea	0	0	0	0	0	0	0	0	0	0	0	0	0
Melanopsis	0	0	0	0	0	0	0	0	0	0	0	0	0
Physa	0	0	0	0	0	0	0	0	0	0	0	0	0
Potamopyrgus	0	1	5	210	59	18	84	3	0	130	0	0.5	1
Sphaerium	0	0	0	0	0	0	0	0	0	0.5	0	0	0
Glyptophysa	0	0	0	0	0	0	0	0	0	0	0	0	0
Hyridella	0	0	0	0	0	0	0	0	0	0	0	0	0
Planorbidae	0	0	0	0	0	0	0	0	0	0	0	0	0

LEPIDOPTERA (Moths)													
Hygraula	0	0	0	0	0	0	0	0	0	0	0	0	0
OLIGOCHAETA (Worms)	4	0	7	0.5	1	28	0	8	1	2	1	1	0
PLATYHELMINTHES (Flatworms)	0.5	0	3	0.5	0	0	1	1	0	0.5	0.5	0	0.5
HIRUDINEA (Leeches)	0	0	0	0.5	0	0	0	0	0	0	0	0	0
CRUSTACEA													
Amphipoda	0	0	3	1	0.5	0	0	0	0	6	0	0	0
Halacarinus	0	0	0	0	0	0	0	0	0	0	0	0	0
Ostracoda	0	0	0	0	0	0	0	0	0	0	0	0	0
Paranephrops	0	0	0	0	0	0	0	0	0	0	0	0	0
Paratya	5	0	0	0	6	0	0.5	0	4	0	0	0	0
Cladocera	0	0	0	0	0	0	0	0	0	0	0	0	0
Copepoda	0	0	0	0	0	0	0	0	0	0	0	0	0
Isopoda	0	0	0	0	0	0	0	0	0	0	0	0	0
Mysid shrimp	0	0	0	0	0	0	0	0	0	0	0	0	0
ACARINA (MITES)	1	0	0	0	1	0	0	1	0	0.5	0	0	0

NEMERTEA (proboscis worms)	0	0	0	0	0	2	2	0	1	0	0	0	0
NEMATODA (nematode worms)	0	0	0	0	0	0	0	0	0	0	0	0	0
NEMATOMORPHA (horse hair worms)	0	0	0	0	0	0	0	0	0	0	0	0	0
BRYOZOA	0	0	0	0	0	0	0	0	0	0	0	0	0
COELENTERATA (Hydroids)	0	0	0	0	0	0	0	0	0	0	0	0	0
COLLEMBOLA	0	0	1	0	0	0	0	0	0	0	0	0	0
TOTAL NUMBER OF INDIVIDUALS	246.5	215.5	222.5	225	231	231	234.5	219.5	52	219	213.5	218.5	231.5
Taxa richness	21	19	30	17	25	22	25	19	13	21	19	21	25
EPT* taxa	7	14	15	3	10	12	12	7	7	8	12	12	14
%EPT*	59.83773	80.97	60	0.888889	56.70996	54.33	49.25	57.4	59.62	21.23	78.22014	92.68	86.18
% Insects	95.33469	99.54	91.46067	5.555556	70.34632	79.22	61.83	94.08	88.46	36.3	99.29742	99.31	99.14
% Dominant taxon	47.4645	32.95	22.02247	93.333333	30.73593	34.63	35.82	24.6	38.46	59.36	36.53396	24.71	20.73
MCI	102.9	150.5	120.7	84.7	108	109.1	104.8	103.2	110.8	97	130.5	130.5	130.4

Table 8.5.2.3 (B): Waikato Regional Council: 14-26 of 26 samples assessed for macro invertebrate communities during the 2009 sampling round.

Site code	1967_2	1414_1	477_14	1513_3	1172_6	1965_1	635_2	572_4	474_2	958_2	1257_4	735_2	1307_11	1307_7	9_4
EPHEMEROPTERA (Mayflies)															
Acanthophlebia	0.5	0	0	0	0	0	0	0	0	0	0	0.5	0.5	0	0.5
Ameletopsis	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Arachnocolus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Atalophlebioides	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Austroclima	2	24	0	0.5	39	49	16	0.5	1	0	3	1	4	6	8
Austronella	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Coloburiscus	27	38	48	75	43	10	61	0	43	2	43	4	1	5	33
Deleatidium	78	36	47	37	20	2	14	0.5	31	4	14	39	16	28	21
Ichthyotus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5
Isothraulus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maiulus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Neozephlebia	0	0	0	0	0	0	0	0	1	0.5	0	12	1	0	17
Nesamaletus	0.5	4	9	1	0	0	1	0	0	0	0	0	1	0	0
Oniscigaster	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rallidens	0	0	0	0	0	0	0	0	0	0	0	0	0.5	0.5	0
Siphlaenigma	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tepakia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Zephlebia	0	8	0	28	6	30	12	0	10	5	0	22	0.5	2	20
Cryophlebia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PLECOPTERA (Stonefly)															
Acroperla	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
Austroperla	0	6	1	9	0	0.5	0	0	0	0	0	0	0	0	1

Megaleptoperla	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0
Spaniocera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stenoperla	0	0	2	2	0	0	1	0	0.5	0	0	0	0	0	1
Zelandobius	0	54	3	1	0	0	0	0	0	0	0	0	0	0	0
Zelandoperla	4	8	45	5	0	0.5	16	0	0	0	0.5	0	0	0	0
Cristoperla	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Taraperla	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Notonemouridae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nesoperla	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TRICOPTERA (Caddisfly)															
Aoteapsyche	32	1	3	5	12	46	7	6	20	5	37	1	79	42	0
Beraeoptera	9	0	27	0	0	0	0	0	0	0	1	0	1	1	0
Costachorema	0	0.5	0	0	0	0	0.5	0	0	0	0	0	0	0	0
Ecnomidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Edpercivalia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Helicopsyche	0	0	0	1	0	45	1	0	3	0	0	0.5	0	0	2
Hudsonema	0	0	0	0	0.5	0	1	1	1	0	0	7	0	0	1
Hydrobiosella	0	3	0	11	0	0	8	0	0	0	0	0	0	0	4
Hydrobiosis	1	0	1	0	0.5	2	1	0.5	2	1	0	0.5	2	4	1
Hydrochorema	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0.5
Neurochorema	0	0	0	0	0.5	0	0	0	2	0	0	0.5	1	1	0
Oecetis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oeconesus	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0
Olinga	5	0	4	0	1	0	0	0	5	16	8	37	0.5	0	0
Orthopsyche	0	20	8	26	0	3	8	0	0	0.5	0	0	0	0	12

Oxyethira	0	0	0	0	0	0	2	0	0	0	1	2	44	3	0
Paroxyethira	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Polypsectopus	0	0	0	0	0	0	0	0	0	0	0	0.5	0	0	0
Psilochorema	0	0	0.5	0.5	0	0	0	0	0.5	9	0	1	0.5	1	2
Pycnocentrella	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pycnocentria	4	0	1	0	2	1	1	1	0	2	0	0	0	0	4
Pycnocentroides	4	0	0	0	1	0	0	30	6	0	58	0	8	1	1
Tiphobiosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Triplectides	0	0	0	0	0	0	0	0	0	4	0	1	0	0	1
Zelolessica	0	0	0	0	0	4	3	0	0	0	0	0	0	0	0
Confluens	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Plectrocnemia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Alloecentrella	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rakiura	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Philorheithrus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MEGALOPTERA (Dobsonfly)															
Archichauliodes	2	0	3	5	2	0	7	0	7	0.5	1	3	0	1	4
NEUROPTERA (Lacewing)															
Kempynus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HEMIPTERA (Waterbugs)															
Anisops	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Microvelia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sigara	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Diaprepocoris	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mesoveliid	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hydrometra	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Saldidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
COLEOPTERA (Beetles)															
Antiporus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dytiscidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Elmidae	41	3	6	2	7	12	17	1	11	3	9	3	13	36	0
Hydraenidae	0	5	2	3	0	0	0	0	3	0	0	0	0	0	0
Hydrophilidae	0	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0
Ptilodactylidae	0	0	0	0	2	0	0.5	0	1	0	0	1	0	0	0.5
Rhantus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scirtidae	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Liodessus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Curclionidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Onychohydrus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DIPTERA (Two winged flies)															
Aphrophila	1	1	7	1	0.5	0.5	14	1	0	0	5	0	1	0	0
Austrosimulium	0.5	0	0	0	9	1	4	1	1	4	0.5	27	0	0	1
Ceratopogonidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Culex	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Empididae	0	0	0	0	0	0.5	4	0	1	0	1	0	0	1	0
Ephydriidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eriopterini	0.5	0	0	0	0	0	0	0	2	0	0	0	0	0	1

Hexatomini	0	0	0	0	0	0	0	0	0	0.5	0	0	0	0	0.5
Limonia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Muscidae	0	0	0	0	0	0	0	0	0	0	0.5	1	0	3	0
Neocurupira	0	1	9	0	0	0	0	0	0	0	0	0	0	0	0
Paradixa	0	0	0	0	0	0	0	0	0	0	0	5	0	0	2
Peritheates	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sciomyzidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tabanidae	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Tanyderidae	0	0	0	0	0.5	0	0	0	0	1	0	0	0	0	0
Zelandotipula	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Psychodidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chironomidae orthoclads	0	0	1	1	1	3	7	0	2	3	4	12	19	10	1
Chironomidae Maoriamesa	0	0	0	0	0	0	0.5	0	0	0	2	0	0.5	0	0
Chironomidae tanytarsini	0	1	0	0	0	3	2	0	19	127	5	2	8	4	2
Chironomidae tanypodinae	0	0	1	0	0	0	1	0	0.5	0	0	6	0	0.5	0
Chironomidae Chironomus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chironomidae podomini	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chironomidae Stictocladus	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Chironomidae (unidentified)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Chironomidae															
Harrisius	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Chironomidae															
Polypedilum	0	3	1	0.5	0	0	1	0	2	3	0	15	1	0	1
Chironomidae															
lobodiamesa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Paralimnophila	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nothodixa	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Stratiomyid	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Molophilus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thaumaleidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ODONATA															
(Damselflies & Dragonflies)															
Antipodochlora	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Austrolestes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Diplacodes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hemicordulia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ischnura	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Procordulia	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Xanthocnemis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aeshna	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MOLLUSCA (Snails)															
Ferrisia	0	0	0	0	0	0	0	5	0	0	0	3	0	0	0
Gyraulus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Latia	0	0	0.5	0	5	0	0	8	0	0	1	0	0	0	0

Lymnaea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Melanopsis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Physa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Potamopyrgus	0	0.5	1	9	49	6	4	171	21	8	19	8	0.5	7	78
Sphaerium	0	0	0	0	0	0.5	0	0	0	0	0	0	0	0	0
Glyptophysa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hyridella	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Planorbidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LEPIDOPTERA (Moths)															
Hydraula	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OLIGOCHAETA (Worms)															
	1	1	0	0	2	1	0	0.5	1	8	11	5	19	51	1
PLATYHELMINTHES (Flatworms)															
	0.5	0	0.5	1	4	2	0	1	0	0	0	0.5	0	0	0
HIRUDINEA (Leeches)															
CRUSTACEA															
Amphipoda	0	0	0	0	0	0	0	7	0	0	0	0	0	0	2
Halocarinus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ostracoda	0	0	0	0	0	0	0	0	0	1	0	3	0	0	0
Paranephrops	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Paratya	0	0	0	0	3	0	0	0	10	1	1	0	0.5	0	0.5
Cladocera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Copepoda	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Isopoda	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Mysid shrimp	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ACARINA (MITES)	0	0	0	1	0	0	0	0	0	0	0	0.5	0	0	0
NEMERTEA (proboscis worms)	0	0	0	0	0	0	0	1	0	1	0	0	2	1	0
NEMATODA (nematode worms)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NEMATOMORPHA (horse hair worms)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BRYOZOA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
COELENTERATA (Hydroids)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
COLLEMBOLA	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
TOTAL NUMBER OF INDIVIDUALS	213.5	218.5	231.5	228.5	211.5	223.5	218.5	236	209.5	213	225.5	227.5	225	209	227
Taxa richness	19	21	25	26	24	23	31	17	30	27	22	35	26	22	34
EPT* taxa	12	12	14	16	12	13	18	7	14	11	8	16	15	11	20
%EPT*	78.2201	92.68	86.18	89.28	59.81	86.80	70.7093	16.7372	60.14	23.0046	72.95	56.4835	51.78	43.78	57.93
% Insects	99.2974	99.31	99.14	95.19	70.21	95.75	98.1693	18.0084	84.73	91.0798	85.81	90.7692	90.22	71.77	64.10
% Dominant taxon	36.5339	24.71	20.73	32.82	23.17	21.92	27.9176	72.4576	20.53	59.6244	25.72	17.1428	35.11	24.40	34.36
MCI	130.5	130.5	130.4	140.8	112.5	120.9	127.1	94.1	122.7	104.6	101.8	110.9	113.1	106.4	130.0

8.5.2.4 Water quality data of sites investigated for this project (courtesy, Environment Waikato database).

Table 8.5.2.4 A: Environment Waikato water quality data: 1- 10 of 32 variables

Location Key	Source Name	Dataset id	%DO	A340F	A340U F	A440F	A740F	A780F	BDisk	BOD5M isc	CHLA	Cond mS/m @25°C
1131-183	Waikato River	8500										
1131-186	Waikato River	8500										
1131-64	Waikato River	5507	111.2		0.060	0.014	< .002		0.70	1.5		15.2
1131-64	Waikato River	5700									0.009	15.9
1236-2	Waitawhiriwhiri Stm	5505	78.7	0.087		0.014		< .002	0.22			21.8
136-2	Gibbons Creek	5330	86.5									8.0
136-2	Gibbons Creek	5501		0.097		0.015		< .002				
180-3	Hospital Stm	5501		0.041		0.006		< .002				
253-4	Kirikiroa Stm	5505	60.6	0.058		0.009		< .002	0.26			21.8
398-14	Mangakotukutuku Stm (Rukuhia)	5330	82.6									7.2
398-14	Mangakotukutuku Stm (Rukuhia)	5501		0.283		0.048		< .002				
398-18	Mangakotukutuku Stm (Rukuhia)	5330	64.7									16.5
398-18	Mangakotukutuku Stm (Rukuhia)	5501		0.046		0.007		0.002				
398-6	Mangakotukutuku Stm	5330	90.6									18.9

	(Rukuhia)											
398-6	Mangakotukutuku Stm (Rukuhia)	5501		0.388		0.070		< .002				
47-2	Bankwood Stm	5330	76.6									24.1
1172_6	Wainui Stm (Raglan)		98.3									13.63
1175_10	Waiomu Stm		107.7									16.63
1247_41	Waitetuna River		100									8.45
1257_4	Waiwawa River		107.9									10.76
1307_11	Whangarahi Stm		114									11.82
1307_7	Whangarahi Stm		116.5									13.18
1414_1	Omanawa Stm Trib		101.9									8.54
1513_3	Te Rekereke Stm		96.3									
1862_4	Mangatia Stm		133									38.6
195_1	Huriwai Stm		171.6									15.33
1965_1	Waikuku Stream		101.1									23.5
1967_2	Oamaru Stream		105.4									9.36
1968_1	Whakakai Stream		99.5									11.15
234_28	Kauaeranga River		108.8									4.29
398_13	Mangakotukutuku Stm (Rukuhia)		191									20.4
467_7	Mangati Stm (Te Akau)		79									28.2
47_2	Bankwood Stm		61.5									16.43
474_2	Mangatu Stm		89.8									11.47
477_14	Mangauika Stm		103.6									7.35

539_1	Maunurima Stm		107.5									15.48
572_4	Naike Stm		103.5									13.07
635_2	Okupata Stm		109									7.7
735_2	Paraunahi Stm		93									28.4
783_2	Pohue Stm		98.7									18.41
958_2	Taraporiki Stm		87.5									10.76
962_4	Tararu Stm		103.8									20.6
9_4	Ahirau Stm Coromandel		95.5									14.49

Table 8.4.2.4 B- Environment Waikato: Water quality data: 11-20 of 32 variables

Location Key	Source Name	Dataset id	DO mg/l	DOC	DRP	E Coli	ENT	F Coli	Fe Diss	NH4	NNN	NO3
1131-183	Waikato River	8500				350		350				
1131-186	Waikato River	8500				210		300				
1131-64	Waikato River	5507			0.010					0.01		0.083
1131-64	Waikato River	5700										
1236-2	Waitawhiriwhiri Stm	5505	7.5		0.017	1500	320	1900		0.67	1.00	
136-2	Gibbons Creek	5330	8.1									
136-2	Gibbons Creek	5501		2.8	0.054				3.00	0.27	0.380	
180-3	Hospital Stm	5501		3.0	0.035				0.51	0.07	0.658	
253-4	Kirikiroa Stm	5505	5.9		0.017	750	900	800		0.20	0.770	
398-14	Mangakotukutuku Stm (Rukuhia)	5330	7.9									
398-14	Mangakotukutuku Stm (Rukuhia)	5501		15.7	0.206				3.02	0.45	1.27	
398-18	Mangakotukutuku Stm (Rukuhia)	5330	6.2									
398-18	Mangakotukutuku Stm (Rukuhia)	5501		5.0	0.013				0.18	0.03	0.838	
398-6	Mangakotukutuku Stm (Rukuhia)	5330	8.6									
398-6	Mangakotukutuku	5501		25.4	0.194				1.61	0.19	0.797	

	Stm (Rukuhia)											
47-2	Bankwood Stm	5330	7.4									
1172_6	Wainui Stm (Raglan)		9.32									
1175_10	Waiomu Stm		9.42									
1247_41	Waitetuna River		9.66									
1257_4	Waiwawa River		9.39									
1307_11	Whangarahi Stm		9.7									
1307_7	Whangarahi Stm		9.79									
1414_1	Omanawa Stm Trib		10.37									
1513_3	Te Rekereke Stm		9.31									
1862_4	Mangatia Stm		10.86									
195_1	Huriwai Stm		13.5									
1965_1	Waikuku Stream		9.7									
1967_2	Oamaru Stream		10.13									
1968_1	Whakakai Stream		9.95									
234_28	Kauaeranga River		9.99									
398_13	Mangakotukutuku Stm (Rukuhia)		21.1									
467_7	Mangati Stm (Te Akau)		6.98									
47_2	Bankwood Stm		5.86									
474_2	Mangatu Stm		8.06									
477_14	Mangauika Stm		10.2									
539_1	Maunurima Stm		9.22									

572_4	Naike Stm		8.87									
635_2	Okupata Stm		10.11									
735_2	Paraunahi Stm		8.56									
783_2	Pohue Stm		8.8									
958_2	Taraporiki Stm		8.04									
962_4	Tararu Stm		9.24									
9_4	Ahirau Stm Coromandel		8.84									

Table 8.4.2.4 C-: Environment Waikato water quality data: 21-32 of 32 variables

Location Key	Source Name	Dataset id	PABUN	pH	SSDirect	Temp	TKN	TN	TP	Turb	Turb Mis	Turb-N	WatTemp	Velocity (m/s)
1131-183	Waikato River	8500												
1131-186	Waikato River	8500												
1131-64	Waikato River	5507		7.9				0.30	0.033		2.0		20.8	
1131-64	Waikato River	5700		7.6								2.0		
1236-2	Waitawhiriwhiri Stm	5505	1	7.0			1.10		0.069			33.0	17.8	
136-2	Gibbons Creek	5330		6.9		17.9				2.0				
136-2	Gibbons Creek	5501			18		0.61		0.183			37.1		
180-3	Hospital Stm	5501			7		0.25		0.056			4.8		
253-4	Kirikiroa Stm	5505	1	6.9			0.60		0.070			33.0	16.9	
398-14	Mangakotukutuku Stm (Rukuhia)	5330		6.9		16.6				3.0				
398-14	Mangakotukutuku Stm (Rukuhia)	5501			13		1.31		0.432			38.5		
398-18	Mangakotukutuku Stm (Rukuhia)	5330				16.9				2.0				
398-18	Mangakotukutuku Stm (Rukuhia)	5501			6		0.35		0.033			3.0		
398-6	Mangakotukutuku Stm (Rukuhia)	5330		7.7		18.3				1.0				
398-6	Mangakotukutuku	5501			9		1.34		0.537			28.8		

	Stm (Rukuhia)													
47-2	Bankwood Stm	5330				16.9				2.0				
1172_6	Wainui Stm (Raglan)												17.6	0.300374
1175_10	Waiomu Stm												22.1	0.386091
1247_41	Waitetuna River												16.6	0.225824
1257_4	Waiwawa River												19.3	0.401042
1307_11	Whangarahi Stm												23.4	0.42015
1307_7	Whangarahi Stm												24	0.250529
1414_1	Omanawa Stm Trib												12	0.2801
1513_3	Te Rekereke Stm												15.9	0.165709
1862_4	Mangatia Stm												22.5	0.198061
195_1	Huriwai Stm												23.1	0.287017
1965_1	Waikuku Stream												16.3	0.604004
1967_2	Oamaru Stream												16.6	0.647873
1968_1	Whakakai Stream												15	0.493167
234_28	Kauaeranga River												18.9	0.375794
398_13	Mangakotukutuku Stm (Rukuhia)												14.5	0.216965
467_7	Mangati Stm (Te Akau)												20.7	0.287017
47_2	Bankwood Stm												17.4	0.319363
474_2	Mangatu Stm												20.4	0.198061

477_14	Mangauika Stm													14.9	0.501058
539_1	Maunurima Stm													22.5	0.258239
572_4	Naike Stm													22.2	0.2801
635_2	Okupata Stm													16.7	0.476993
735_2	Paraunahi Stm													19.4	0.14005
783_2	Pohue Stm													21.1	0.804526
958_2	Taraporiki Stm													19.3	0.207728
962_4	Tararu Stm													21.3	0.2801
9_4	Ahirau Stm Coromandel													18.8	0.108

8.5.3 Hawkes Bay Regional Council

8.5.3.1 Sample storage : Stream identifier codes

Table 8.5.3.1: Sample labeling with stream identifier codes and stored as shown

Box 1 = 100 samples	STREAM	SHORT CODE LABEL	STREAM IDENTIFIER #
1	Porangahau at Kate's quarry site 14	POR1	HB10_POR1
2		POR2	HB10_POR2
3		POR3	HB10_POR3
4		POR4	HB10_POR4
5		POR5	HB10_POR5
6	Tukipo SH50 #144	TKP1	HB10_TKP1
7		TKP2	HB10_TKP2
8		TKP3	HB10_TKP3
9		TKP4	HB10_TKP4
10		TKP5	HB10_TKP5
11	Mangaonuka at Tikokino 284	MAN1	HB10_MAN1
12		MAN2	HB10_MAN2
13		MAN3	HB10_MAN3
14		MAN4	HB10_MAN4
15		MAN5	HB10_MAN5
16	Puhokio at Te Apiti	PUH1	HB10_PUH1
17		PUH2	HB10_PUH2
18		PUH3	HB10_PUH3
19		PUH4	HB10_PUH4
20		PUH5	HB10_PUH5
21	Tukituki BB15	TUK1	HB10_TUK1
22		TUK2	HB10_TUK2
23		TUK3	HB10_TUK3
24		TUK4	HB10_TUK4

25		TUK5	HB10_TUK5
26	Tukituki at Red bridge 407	TRB1	HB10_TRB1
27		TRB2	HB10_TRB2
28		TRB3	HB10_TRB3
29		TRB4	HB10_TRB4
30		TRB5	HB10_TRB5
31	Mangakuri 2414	MGK1	HB10_MGK1
32		MGK2	HB10_MGK2
33		MGK3	HB10_MGK3
34		MGK4	HB10_MGK4
35		MGK5	HB10_MGK5
36	Waipawa SH50 #280	WP1	HB10_WP1
37		WP2	HB10_WP2
38		WP3	HB10_WP3
39		WP4	HB10_WP4
40		WP5	HB10_WP5
41	Mangataroa	MGT1	HB10_MGT1
42		MGT2	HB10_MGT2
43		MGT3	HB10_MGT3
44		MGT4	HB10_MGT4
45		MGT5	HB10_MGT5
46	Mohaka downstream of Taharua	MKD1	HB10_MKD1
47		MKD2	HB10_MKD2
48		MKD3	HB10_MKD3
49		MKD4	HB10_MKD4
50		MKD5	HB10_MKD5
51	Mohaka upstream of Taharua	MKU1	HB10_MKU1
52		MKU2	HB10_MKU2
53		MKU3	HB10_MKU3
54		MKU4	HB10_MKU4
55		MKU5	HB10_MKU5
56	Taharua at Poronui	TP1	HB10_TP1

57		TP2	HB10_TP2
58		TP3	HB10_TP3
59		TP4	HB10_TP4
60		TP5	HB10_TP5
61	Tukituki at Shagrock 281	TSH1	HB10_TSH1
62		TSH2	HB10_TSH2
63		TSH3	HB10_TSH3
64		TSH4	HB10_TSH4
65		TSH5	HB10_TSH5
66	Makaretu SH50 L9	MAK1	HB10_MAK1
67		MAK2	HB10_MAK2
68		MAK3	HB10_MAK3
69		MAK4	HB10_MAK4
70		MAK5	HB10_MAK5
71	Hangaroa # 337	HAN1	HB10_HAN1
72		HAN2	HB10_HAN2
73		HAN3	HB10_HAN3
74		HAN4	HB10_HAN4
75		HAN5	HB10_HAN5
76	Te Iringawhare #341	TIW1	HB10_TIW1
77		TIW2	HB10_TIW2
78		TIW3	HB10_TIW3
79		TIW4	HB10_TIW4
80		TIW5	HB10_TIW5
81	Ruatitiri 336	RUA1	HB10_RUA1
82		RUA2	HB10_RUA2
83		RUA3	HB10_RUA3
84		RUA4	HB10_RUA4
85		RUA5	HB10_RUA5
86	Tutaekuri at Lawrence Hut # 39885	TUT1	HB10_TUT1
87		TUT2	HB10_TUT2
88		TUT3	HB10_TUT3

89		TUT4	HB10_TUT4
90		TUT5	HB10_TUT5
91	Tukituki at SH50 356	TKT1	HB10_TKT1
92		TKT2	HB10_TKT2
93		TKT3	HB10_TKT3
94		TKT4	HB10_TKT4
95		TKT5	HB10_TKT5
96	319 Anarua at Skudders Road 39825	ANA1	HB10_ANA1
97		ANA2	HB10_ANA2
98		ANA3	HB10_ANA3
99		ANA4	HB10_ANA4
100		ANA5	HB10_ANA5
101	Mangaone at Rissington site ID 266 / 39883	MNR1	HB10_MNR1
102		MNR2	HB10_MNR2
103		MNR3	HB10_MNR3
104		MNR4	HB10_MNR4
105		MNR5	HB10_MNR5
106	Esk @ Waipunga # 39811	ESK1	HB10_ESK1
107		ESK2	HB10_ESK2
108		ESK3	HB10_ESK3
109		ESK4	HB10_ESK4
110		ESK5	HB10_ESK5
111	Waikaretaheke #1319	WKR1	HB10_WKR1
112		WKR2	HB10_WKR2
113		WKR3	HB10_WKR3
114		WKR4	HB10_WKR4
115		WKR5	HB10_WKR5
116	Ripia upstream Mohaka 604 / 39816	RIP1	HB10_RIP1
117		RIP2	HB10_RIP2
118		RIP3	HB10_RIP3
119		RIP4	HB10_RIP4

120		RIP5	HB10_RIP5
121	Porangahau 397	PGH1	HB10_PGH1
122		PGH2	HB10_PGH2
123		PGH3	HB10_PGH3
124		PGH4	HB10_PGH4
125		PGH5	HB10_PGH5
126	Mohaka at Willow flat	MWF1	HB10_MWF1
127		MWF2	HB10_MWF2
128		MWF3	HB10_MWF3
129		MWF4	HB10_MWF4
130		MWF5	HB10_MWF5
131	Ananiwaniwa # 333	ANI1	HB10_ANI1
132		ANI2	HB10_ANI2
133		ANI3	HB10_ANI3
134		ANI4	HB10_ANI4
135		ANI5	HB10_ANI5
136	Mokomokonui	MKM1	HB10_MKM1
137		MKM2	HB10_MKM2
138		MKM3	HB10_MKM3
139		MKM4	HB10_MKM4
140		MKM5	HB10_MKM5
141	Mohaka at Raupunga 39824	MRP1	HB10_MRP1
142		MRP2	HB10_MRP2
143		MRP3	HB10_MRP3
144		MRP4	HB10_MRP4
145		MRP5	HB10_MRP5
146	Herehere stream	HER1	HB10_HER1
147		HER2	HB10_HER2
148		HER3	HB10_HER3
149		HER4	HB10_HER4
150		HER5	HB10_HER5
151	Manga at K	MNK1	HB10_MNK1

152		MNK2	HB10_MNK2
153		MNK3	HB10_MNK3
154		MNK4	HB10_MNK4
155		MNK5	HB10_MNK5
156	Manga at Te Aut	MNT1	HB10_MNT1
157		MNT2	HB10_MNT2
158		MNT3	HB10_MNT3
159		MNT4	HB10_MNT4
160		MNT5	HB10_MNT5
161	Ruahapia	RHP1	HB10_RHP1
162		RHP2	HB10_RHP2
163		RHP3	HB10_RHP3
164		RHP4	HB10_RHP4
165		RHP5	HB10_RHP5

8.5.3.2 Catchment land-use data

Table 8.5.3.2.: Hawkes Bay Regional Council - Catchment land-use data for stream sites as obtained from the RC database.

SiteID	SiteName	CatchmentD	Easting	Northing	REC Class	NZREACH	Ref Site	Based On	Pristine or not?	Substrate	Sampling Procedure	SBMCI or HBMCI	Dominant Surrounding Land Use/Cover At Site
333	Aniwaniwa Stream at Aniwaniwa	Wairoa River	2872485	6265307	CX/Lk/VA/IF/ MO/LG	8003529	Yes	Unmodified	Pristine	Hard	C1	HBMCI	Indigenous Forest
9	Esk River at Waipunga Bridge	Esk River	2839017	6195088	WW/L/M/P/ HO/LG	8021730	No	>20% pasture or forestry	Not	Hard	C1	HBMCI	Extensive Pasture
337	Hangaroa River at Doneraile Park	Wairoa River	2908476	6264297	CW/H/SS/P/ HO/LG	8003680	No	>20% pasture or forestry	Not	Hard	C1	HBMCI	Extensive Pasture
3121	Herehere Stream @ Te Aute Rd	Ngaruroro River	2841599	6163117	WD/L/HS/P/ MO/LG	8026084	No	Urban	Not	Hard	C1	HBMCI	Urban
19	Makaretu Stream at State Highway 50	Tukituki River - Lower	2793612	6126919	WD/L/AI/P/ LO/LG	8031491	No	>20% pasture or forestry	Not	Hard	C1	HBMCI	Extensive Pasture
2414	Mangakuri River	Mangakuri	2843587	6130501	WW/L/SS/P/	8030950	No	>20%	Not	Soft	C2	SBMCI	Extensive

	at Kairakau				HO/LG			pasture or forestry					Pasture
266	Mangaone River at Rissington	Tutaekuri River	2830061	6189373	WW/L/M/P/ HO/LG	8022581	No	>20% pasture or forestry	Not	Hard	C1	HBMCI	Extensive Pasture
284	Mangaonuku Stream at Waipawa Tikokino Rd	Tukituki River - Lower	2811298	6138276	CD/L/AI/P/ HO/LG	8029835	No	>20% pasture or forestry	Not	Hard	C1	HBMCI	Extensive Pasture
3118	Mangarau Stream @ Keirunga Rd	Ngaruroro River	2843288	6162028	WD/L/HS/P/ LO/LG	8026051	No	Industrial	Not	Hard	C1	HBMCI	Urban
3120	Mangarau Stream @ Te Aute Rd	Ngaruroro River	2842192	6163233	WD/L/HS/P/ LO/LG	8026051	No	Urban	Not	Hard	C1	HBMCI	Urban
3152	Mohaka d/s Taharua conflu	Mohaka River	2796134	6230508	CW/H/VA/IF/ HO/LG	8014053	No	>10% pasture or forestry	Not	Hard	C1	HBMCI	Indigenous Forest
3	Mohaka River at Raupunga	Mohaka River	2868145	6227701	CW/H/VA/IF/ HO/LG	8014919	No	>20% pasture or forestry	Not	Hard	C1	HBMCI	Extensive Pasture
595	Mohaka River at Willowflat	Mohaka River	2851834	6237001	WW/L/VA/EF/ LO/HG	8011587	No	>20% pasture or forestry	Not	Hard	C1	HBMCI	Exotic Forestry

								forestry					
2961	Mohaka u/s Taharua conflu	Mohaka River	2793572	6230988	CW/H/VA/IF/ HO/LG	8013661	Yes	Unmodified	Pristine	Hard	C1	HBMCI	Indigenous Forest
321	Mokomokonui Stream U/S Waipunga	Mohaka River	2820627	6233249	CW/H/HS/IF/ HO/LG	8013017	No	>20% pasture or forestry	Not	Hard	C1	HBMCI	Indigenous Forest
14	Porangahau River at SH52 Opposite Quarry	Porangahau River	2814330	6094858	WD/L/SS/P/ HO/LG	8034437	No	>20% pasture or forestry	Not	Hard	C1	HBMCI	Extensive Pasture
397	Porangahau Stream at Oruawhara Road	Tukituki River - Lower	2797667	6125806	CD/L/AI/P/ MO/LG	8031553	No	>20% pasture or forestry	Not	Hard	C1	HBMCI	Extensive Pasture
394	Puhokio Stream at Te Apiti Rd	Pouhokio Stream	2850686	6145640	WW/L/HS/P/ MO/LG	8028639	No	>20% pasture or forestry	Not	Hard	C1	HBMCI	Extensive Pasture
604	Ripia River U/S Mohaka	Mohaka River	2814304	6218380	CW/H/VA/IF/ HO/LG	8017485	No	>20% pasture or forestry	Not	Hard	C1	HBMCI	Exotic Forestry
3119	Ruahapia Stream @ Show Grounds	Ngaruroro River	2841627	6168096	WD/L/AI/U/ LO/LG	8025385	No	Urban	Not	Soft	C2	SBMCI	Industrial
336	Ruakituri River at Sports Ground	Wairoa River	2899233	6255617	CW/H/VA/P/ HO/LG	8005683	No	>20% pasture or forestry	Not	Hard	C1	HBMCI	Extensive Pasture

2442	Taharua Stream at Poronui Station	Mohaka River	2794735	6238237	CW/H/VA/P/HO/LG	8011115	No	>20% pasture or forestry	Not	Hard	C1	HBMCI	Intensive Pasture
341	Te Iringaowhare Stream at Tukurangi Road	Wairoa River	2877604	6245144	WW/L/SS/EF/MO/HG	8008768	No	>20% pasture or forestry	Not	Hard	C1	HBMCI	Exotic Forestry
144	Tukipo River at State Highway 50	Tukituki River - Lower	2794766	6132380	CW/L/AI/P/MO/LG	8030706	No	>20% pasture or forestry	Not	Hard	C1	HBMCI	Extensive Pasture
356	Tukituki River at Ashcott Bridge S.H. 50	Tukituki River - Lower	2796308	6135724	CW/H/HS/P/MO/LG	8030251	No	>20% pasture or forestry	Not	Hard	C1	HBMCI	Extensive Pasture
15	Tukituki River at Black Bridge	Tukituki River - Lower	2847566	6170374	CD/L/AI/P/HO/LG	8025058	No	>20% pasture or forestry	Not	Hard	C1	HBMCI	Extensive Pasture
407	Tukituki River at Red Bridge	Tukituki River - Lower	2846674	6158087	CD/L/AI/P/HO/LG	8026822	No	>20% pasture or forestry	Not	Hard	C1	HBMCI	Extensive Pasture
2403	Tukituki River at Shagrock	Tukituki River - Lower	2826307	6133014	CW/L/AI/P/HO/LG	8030624	No	>20% pasture or forestry	Not	Hard	C1	HBMCI	Extensive Pasture
272	Tutaekuri River at Lawrence Hut	Tutaekuri River	2806267	6198041	CW/H/VA/S/HO/MG	8021245	Yes	Unmodified	Pristine	Hard	C1	HBMCI	Indigenous Forest

1319	Waikaretaheke Stm at Terapatiki	Wairoa River	2873735	6252356	CX/Lk/VA/IF/ HO/LG	8006591	No	>20% pasture or forestry	Not	Hard	C1	HBMCI	Extensive Pasture
280	Waipawa River at State Highway 50	Tukituki River - Lower	2804722	6143515	CW/H/HS/P/ HO/LG	8028989	No	>20% pasture or forestry	Not	Hard	C1	HBMCI	Extensive Pasture
277	Mangatarata Stream at Mangatarata Road	Tukituki River - Lower	2819614	6128052	WD/L/SS/P/ HO/LG	8031291	No	>20% pasture or forestry	Not	Hard			

8.5.3.3 Hawkes Bay Regional Council: Macroinvertebrate data from the 2009 sampling round.

Table 8.5.3.3 (A): Hawkes Bay macro invertebrate data 1-9 of 28 sites evaluated as part of regular sampling program. Codes used by the Regional Council are R – rare, C – common, A – abundant, VA – very abundant, VVA – very very abundant. For generation of MDS plots, codes were transformed by assigning values to each code as follows R – 1, C – 2, A – 3, VA - 4, and VVA – 5.

Site name			Aniwaniw a @SH38	Esk @ Waipunga	Hangaroa @ Dinneraille Prk	Herehere @ Te Aute Rd	Mahaka @ Willow Flat	Makaretu @ SH50	Mangakau ri @ Mangakau ri	Mangarau @ Keirunga	Mangarau @ Te Aute Rd
Site ID No.			333	9	337	3121	595	19	2414	3118	3120
Sample No.			37895	38021	37908	37923	38115	38005	38010	37925	37924
Taxa	MCI	MCI-sb	0	0	0	0	0	0	0	0	0
	score	score	0	0	0	0	0	0	0	0	0
Mayfly Acanthophlebia	7	9.6	0	0	0	0	0	0	0	0	0
Mayfly Ameletopsis	10	10	0	0	0	0	0	0	0	0	0
Mayfly Arachnocolus	8	8.1	0	0	0	0	0	0	0	0	0
Mayfly Atalophlebioides	9	4.4	0	0	0	0	0	0	0	0	0
Mayfly Austroclima	9	6.5	VA	A	R	0	0	0	0	0	0
Mayfly Austronella	7	4.7	R	0	0	0	0	0	0	0	0
Mayfly Coloburiscus	9	8.1	A	C	0	0	0	0	0	0	0
Mayfly Deleatidium	8	5.6	A	A	0	0	A	A	0	0	R

Mayfly Ichthybotus	8	9.2	0	0	0	0	0	0	0	0	0	0
Mayfly Isothraulus	8	7.1	0	0	0	0	0	0	0	0	0	0
Mayfly Mauiulus	5	4.1	C	0	R	0	0	0	0	0	0	0
Mayfly Neozephlebia	7	7.6	A	0	0	0	0	0	0	0	0	0
Mayfly Nesameletus	9	8.6	VA	0	0	0	R	0	0	0	0	0
Mayfly Oniscigaster	10	5.1	0	0	0	0	0	0	0	0	0	0
Mayfly Rallidens	9	3.9	0	0	0	0	0	0	0	0	0	0
Mayfly Siphlaenigma	9	9	0	0	0	0	0	0	0	0	0	0
Mayfly Tepakia	8	7.6	0	0	0	0	0	0	0	0	0	0
Mayfly Zephlebia	7	8.8	C	0	R	0	0	R	0	0	0	R
Stonefly Acroperla	5	5.1	0	0	0	0	0	0	0	0	0	0
Stonefly Austroperla	9	8.4	0	0	0	0	0	0	0	0	0	0
Stonefly Cristaperla	8	8	0	0	0	0	0	0	0	0	0	0
Stonefly Megaleptoperla	9	7.3	0	0	0	0	0	0	0	0	0	0
Stonefly Nesoperla	5	5.7	0	0	0	0	0	0	0	0	0	0
Stonefly Spaniocerca	8	8.8	0	0	0	0	0	0	0	0	0	0
Stonefly Stenoperla	10	9.1	R	0	0	0	0	0	0	0	0	0
Stonefly Taraperla	7	8.3	0	0	0	0	0	0	0	0	0	0
Stonefly	5	7.4	0	0	0	0	0	0	0	0	0	0

Zelandobius												
Stonefly												
Zelandoperla	10	8.9	C	0	0	0	0	0	0	0	0	0
Caddisfly												
Alloecentrella	9	9	0	0	0	0	0	0	0	0	0	0
Caddisfly												
Aoteapsyche	4	6	VA	VA	C	0	R	C	0	R	0	0
Caddisfly												
Beraeoptera	8	7	0	0	0	0	0	0	0	0	0	0
Caddisfly Confluens	5	7.2	0	0	0	0	0	0	0	0	0	0
Caddisfly												
Costachorema	7	7.2	0	0	0	0	0	0	0	0	0	0
Caddisfly												
Ecnomidae	8	7	0	0	0	0	0	0	0	0	0	0
Caddisfly												
Edpercivalia	9	6.3	0	0	0	0	0	0	0	0	0	0
Caddisfly												
Helicopsyche	10	8.6	R	0	0	0	0	0	0	0	0	0
Caddisfly												
Hudsonema	6	6.5	R	R	C	0	0	R	0	A	C	0
Caddisfly												
Hydrobiosella	9	7.6	0	0	0	0	0	0	0	0	0	0
Caddisfly												
Hydrobiosis	5	6.7	C	C	R	0	R	R	0	0	0	0
Caddisfly												
Hydrochorema	9	9	0	0	0	0	0	0	0	0	0	0

Caddisfly Kokiria	9	9	0	0	0	0	0	0	0	0	0	0
Caddisfly Neurochorema	6	6	R	0	0	0	0	0	0	0	0	0
Caddisfly Oecetis	6	6.8	0	0	R	0	0	0	0	0	0	0
Caddisfly Oeconesidae	9	6.4	0	0	0	0	0	0	0	0	0	0
Caddisfly Olinga	9	7.9	A	R	0	0	R	C	0	0	0	0
Caddisfly Orthopsyche	9	7.5	0	0	0	0	0	0	0	0	0	0
Caddisfly Oxyethira	2	1.2	C	0	0	R	0	R	R	R	R	R
Caddisfly Paroxyethira	2	3.7	0	0	0	R	0	0	R	0	0	0
Caddisfly Philorheithrus	8	5.3	0	0	0	0	0	0	0	0	0	0
Caddisfly Plectrocnemia	8	6.6	0	0	0	0	0	0	0	0	0	0
Caddisfly Polypsectopus	8	8.1	R	0	0	0	0	0	0	0	0	0
Caddisfly Psilochorema	8	7.8	R	R	0	0	0	C	0	0	0	0
Caddisfly Pycnocentrella	9	9	0	0	0	0	0	0	0	0	0	0
Caddisfly Pycnocentria	7	6.8	C	A	0	0	0	R	0	0	0	0
Caddisfly	5	3.8	C	VA	VA	0	C	VA	0	0	0	0

Pycnocentroides												
Caddisfly Tiphobiosis	6	9.3	0	0	0	0	0	0	0	0	0	0
Caddisfly Triplectides	5	5.7	0	0	R	0	0	0	C	R		0
Caddisfly Zelolessica	10	6.5	0	0	0	0	0	0	0	0	0	0
Damselfly Austrolestes	6	0.7	0	0	0	0	0	0	R		0	0
Damselfly Ischnura	6	3.1	0	0	0	0	0	0	0	0	0	0
Damselfly Xanthocnemis	5	1.2	0	0	0	R		0	0	C	0	0
Dragonfly Aeshnidae	5	1.4	0	0	0	0	0	0	0	0	0	0
Dragonfly Antipodochlora	6	6.3	0	0	0	0	0	0	0	0	0	0
Dragonfly Hemicordulia	5	0.4	0	0	0	0	0	0	0	0	0	0
Dragonfly Procordulia	6	3.8	0	0	0	0	0	0	R		0	0
Bug Anisops	5	2.2	0	0	0	R		0	0	0	0	0
Bug Diaprepocoris	5	4.7	0	0	0	0	0	0	0	0	0	0
Bug Mesovelia	5	5	0	0	0	0	0	0	0	0	0	0
Bug Microvelia	5	4.6	0	0	C	R		0	0	C	R	R
Bug Saldidae	5	3.9	0	0	0	0	0	0	0	0	0	0

Bug Sigara	5	2.4	0	R	VVA	0	0	0	C	C	C
Dobsonfly Archichauliodes	7	7.3	A	0	0	0	0	R	0	0	0
Scorpionfly Nannochorista	7	7	0	0	0	0	0	0	0	0	0
Lacewing Kempynus	5	5	0	0	0	0	0	0	0	0	0
Lacewing Sisyra	5	5	0	0	0	0	0	0	0	0	0
Beetle Antiporus	5	3.5	0	0	0	0	0	0	C	0	0
Beetle Berosus	5	5	0	0	C	0	0	0	0	0	0
Beetle Dytiscidae	5	0.4	0	0	0	0	0	0	R	0	0
Beetle Elmidae	6	7.2	R	VA	C	0	R	VA	0	0	R
Beetle Hydraenidae	8	6.7	0	0	0	0	0	0	0	0	0
Beetle Hydrophilidae	5	8	0	0	0	0	R	0	R	0	0
Beetle Liodessus	5	4.9	0	0	0	0	0	0	0	0	0
Beetle Ptilodactylidae	8	7.1	0	0	0	0	0	0	0	0	0
Beetle Rhantus	5	1	0	0	0	0	0	0	0	0	0
Beetle Scirtidae	8	6.4	0	0	0	0	0	R	0	0	0
Beetle Staphylinidae	5	6.2	0	0	0	0	0	0	0	0	0
True Fly Aphrophila	5	5.6	R	R	0	0	0	R	0	0	0
True Fly Austrosimulium	3	3.9	R	0	0	0	0	0	0	0	0

True Fly Blephariceridae	7	7		0	0	0	0	0	0	0	0	0
True Fly Ceratopogonidae	3	6.2	R		0	0	0	0	0	0	R	0
True Fly Chironomus	1	3.4	R		0	R		0	R	0	0	C
True Fly Corynoneura	2	1.7		0	0	0	0	0	0	0	0	0
True Fly Culicidae	3	1.2		0	0	0	0	0	0	0	0	0
True Fly Dolichopididae	3	8.6		0	0	0	0	0	0	0	0	0
True Fly Empididae	3	5.4		0	0	0	0	0	0	0	0	0
True Fly Ephydriidae	4	1.4		0	0	0	0	0	0	0	0	0
True Fly Eriopterini	9	7.5		0	A	0	0	C	A	0	0	0
True Fly Harrisius	6	4.7		0	0	0	0	0	0	0	0	0
True Fly Hexatomini	5	6.7	R		0	0	0	0	0	0	0	0
True Fly Limonia	6	6.3		0	0	0	0	0	0	0	0	0
True Fly Lobodiamesa	5	7.7		0	0	0	0	0	0	0	0	0
True Fly Maoridiamesa	3	4.9		0	0	0	0	0	0	0	0	0
True Fly Mischoderus	4	5.9		0	0	0	0	0	0	0	R	0
True Fly Molophilus	5	6.3		0	0	0	0	R	0	0	0	0
True Fly Muscidae	3	1.6	R		R	0	0	R	0	R	C	R

True Fly Nothodixa	4	9.3	0	0	0	0	0	0	0	0	0
True Fly Orthocladiinae	2	3.2	C	C	R	0	C	R	R	R	VA
True Fly Paradixa	4	8.5	0	0	0	0	0	0	0	0	0
True Fly Paralimnophila	6	7.4	0	0	0	0	0	0	0	0	0
True Fly Paucispinigera	6		0	0	0	0	0	0	0	0	0
True Fly Pelecorhynchidae	9	9	0	0	0	0	0	0	0	0	0
True Fly Podominae	8	6.4	0	0	0	0	0	0	0	0	0
True Fly Polypedilum	3	8	0	0	0	0	0	0	0	R	0
True Fly Psychodidae	1	6.1	0	0	0	0	0	0	R	0	0
True Fly Sciomyzidae	3	3	0	0	0	0	0	0	0	R	0
True Fly Stictocladus	8	8	0	0	0	0	0	0	0	0	0
True Fly Stratiomyidae	5	4.2	0	0	0	0	0	0	0	R	R
True Fly Syrphidae	1	1.6	0	0	0	0	0	0	0	0	0
True Fly Tabanidae	3	6.8	0	C	0	0	C	0	0	0	0
True Fly Tanypodinae	5	6.5	A	R	C	0	C	0	0	0	0

True Fly Tanytarsini	3	4.5	A	C	VA	0	C	0	0	0	R
True Fly Thaumaleidae	9	8.8	0	0	0	0	0	0	0	0	0
True Fly Zelandotipula	6	3.6	0	0	0	0	0	0	0	R	0
Moth Hygraula	4	1.3	0	0	0	0	0	0	0	0	0
Collembola	6	5.3	0	0	0	0	0	0	0	0	0
Crustacea Cladocera	5	0.7	0	0	0	C	0	0	VVA	0	0
Crustacea Copepoda	5	2.4	0	0	0	VA	0	0	C	0	0
Crustacea Halicarcinus crabs	3	5.1	0	0	0	0	0	0	0	0	0
Crustacea Helice crabs	3	6.6	0	0	0	0	0	0	0	0	0
Crustacea Isopoda	5	4.5	0	0	0	0	0	0	0	0	0
Crustacea Melita amphipod	5	5	0	0	0	0	0	0	0	0	0
Crustacea Mysid shrimps	5	6.4	0	0	0	0	0	0	0	0	0
Crustacea Ostracoda	3	1.9	0	0	C	A	R	0	0	VA	VVA
Crustacea Paracalliope	5	5	0	0	0	VA	0	R	0	0	R
Crustacea Paraleptamphopus	5	5	0	0	0	0	0	0	0	0	0

Crustacea												
Paranephrops	5	8.4	0	0	0	0	0	0	0	0	0	0
Crustacea												
Paranthuria	5	4.9	0	0	0	0	0	0	0	0	0	0
Crustacea Paratya	5	3.6	0	0	0	0	0	0	0	0	0	0
Crustacea												
Phreatogammarus	5	5	0	0	0	0	0	0	0	0	0	0
Crustacea Talitridae	5	5	0	0	0	0	0	0	0	R		0
Crustacea												
Tanaidacea	4	6.8	0	0	0	0	0	0	0	0	0	0
MITES	5	5.2	0	0	A	R	R	0	R	0	R	
SPIDERS												
Dolomedes	5	6.2	0	0	0	0	0	0	0	0	0	0
TARDIGRADES	4.5	4.5	0	0	0	0	0	0	0	0	0	0
Mollusc Ferrissia	3	2.4	0	0	0	0	0	0	0	0	0	0
Mollusc												
Glyptophysa	5	0.3	0	0	0	0	0	0	0	0	0	0
Mollusc Gyraulus	3	1.7	0	R	0	VA	0	R	C	0	0	0
Mollusc Hyridella	3	6.7	0	0	0	0	0	0	0	0	0	0
Mollusc Latia	3	6.1	0	0	0	0	0	0	0	0	0	0
Mollusc												
Lymnaeidae	3	1.2	0	0	0	0	0	0	0	0	0	0
Mollusc Melanopsis	3	1.9	0	0	0	0	0	0	0	0	0	0
Mollusc Physella	3	0.1	0	0	0	R	0	0	A	A	C	
Mollusc	4	2.1	C	VA	VVA	VVA	C	VA	VVA	VVA	VVA	VA

Potamopyrgus											
Mollusc Sphaeriidae	3	2.9	0	0	R	0	0	0	0	0	R
OLIGOCHAETES	1	3.8	R	A	C	C	C	0	0	VA	VA
LEECHES	3	1.2	0	0	R	0	0	0	R	C	R
PADDLEWORMS	3	6.7	0	0	0	0	0	0	0	0	0
FLATWORMS	3	0.9	R	0	R	A	0	0	0	A	C
Rhabdoceol Flatworms	3	0.9	0	0	0	R	0	0	C	0	0
NEMATODES	3	3.1	0	R	0	0	R	R	0	0	C
NEMERTEANS	3	1.8	0	R	0	0	0	0	0	R	C
NEMATOMORPHS	3	4.3	0	0	0	0	0	0	0	0	0
HYDROIDS	3	1.6	0	0	0	0	0	0	0	0	R
BRYOZOA	4	4	0	0	0	0	0	0	0	0	0
			0	0	0	0	0	0	0	0	0
Number of Taxa			35	24	24	16	21	20	22	22	24
EPT Value			21	10	9	2	6	10	3	4	4
% EPT (taxa number)			1	0	0	0	0	1	0	0	0
MCI Value			115.4	104.2	88.3	73.8	93.3	113.0	80.0	73.6	76.7

Table 8.5.3.3 (B): Hawkes Bay macro invertebrate data 10-19 of 28 sites evaluated as part of regular sampling program. Codes used by the Regional Council are R – rare, C – common, A – abundant, VA – very abundant, VVA – very very abundant. For generation of MDS plots, codes were transformed by assigning values to each code as follows R – 1, C – 2, A – 3, VA - 4, and VVA – 5.

Site name			Mangone @ Rissington	Mohaka @ Raupunga	Mohaka DS Taharua	Mohaka US Taharua	Mokomokou @ Tarataakina Rd	Porangahau @ Kates Quarry	Porangahau @ Oruawharo	Puhokio @ Te Apiti Rd	Ripia US Mohaka	Ruahapia @ show grounds POORLY PRESERVED
Site ID No.			266	3	3152	2961	321	14	397	394	604	3119
Sample No.			37920	38116	38070	38069	38024	38011	38009	37929	38022	37877
Taxa	MCI	MCI-sb	0	0	0	0	0	0	0	0	0	0
	score	score	0	0	0	0	0	0	0	0	0	0
Mayfly Acanthophlebia	7	9.6	0	0	0	0	0	0	0	0	R	0
Mayfly Ameletopsis	10	10	0	0	0	0	0	0	0	0	0	0
Mayfly Arachnocolus	8	8.1	0	0	0	0	0	0	0	0	0	0
Mayfly Atalophlebioides	9	4.4	0	0	0	0	0	0	0	0	0	0
Mayfly Austroclima	9	6.5	A	0	C	C	R	0	0	C	C	0
Mayfly Austronella	7	4.7	0	0	0	0	0	0	0	0	0	0
Mayfly Coloburiscus	9	8.1	R	R	VA	A	A	0	0	0	A	0
Mayfly Deleatidium	8	5.6	A	A	VA	A	A	0	VA	R	VA	0
Mayfly Ichthybotus	8	9.2	0	0	0	0	0	0	0	0	0	0
Mayfly Isothraulus	8	7.1	0	0	0	0	0	0	0	0	0	0

Mayfly Mauiulus	5	4.1	0	0	0	0	0	0	0	0	0	0	0
Mayfly Neozephlebia	7	7.6	0	0	0	0	0	0	0	0	0	0	0
Mayfly Nesameletus	9	8.6	0	0	A	VA	A	0	0	0	VA	0	0
Mayfly Oniscigaster	10	5.1	0	0	0	0	0	0	0	0	0	0	0
Mayfly Rallidens	9	3.9	0	0	0	0	0	0	0	0	0	0	0
Mayfly Siphlaenigma	9	9	0	0	0	0	0	0	0	0	0	0	0
Mayfly Tepakia	8	7.6	0	0	0	0	0	0	0	0	0	0	0
Mayfly Zephlebia	7	8.8	0	0	0	0	0	0	0	R	0	0	0
Stonefly Acroperla	5	5.1	0	0	0	0	0	0	0	0	0	0	0
Stonefly Austroperla	9	8.4	0	0	R	R	C	0	0	0	R	0	0
Stonefly Cristaperla	8	8	0	0	0	0	0	0	0	0	0	0	0
Stonefly Megaleptoperla	9	7.3	0	0	0	R	R	0	0	0	0	0	0
Stonefly Nesoperla	5	5.7	0	0	0	0	0	0	0	0	0	0	0
Stonefly Spaniocerca	8	8.8	0	0	0	0	0	0	0	0	0	0	0
Stonefly Stenoperla	10	9.1	0	0	0	0	0	0	0	0	0	0	0
Stonefly Taraperla	7	8.3	0	0	0	0	0	0	0	0	0	0	0
Stonefly Zelandobius	5	7.4	0	0	0	0	0	0	0	0	R	0	0
Stonefly Zelandoperla	10	8.9	0	0	VA	A	A	0	0	0	R	0	0
Caddisfly Alloecentrella	9	9	0	0	0	0	0	0	0	0	0	0	0
Caddisfly Aoteapsyche	4	6	VA	VA	A	C	A	0	A	A	A	0	0
Caddisfly Beraeoptera	8	7	0	0	C	C	A	0	0	0	A	0	0
Caddisfly Confluens	5	7.2	0	0	0	0	0	0	0	0	0	0	0
Caddisfly Costachorema	7	7.2	0	0	R	0	R	0	0	0	0	0	0

Caddisfly Ecnomidae	8	7	0	0	0	0	0	0	0	0	0	0	0
Caddisfly Edpercivalia	9	6.3	0	0	0	0	0	0	0	0	0	0	0
Caddisfly Helicopsyche	10	8.6	0	0	0	0	0	0	0	0	R	0	0
Caddisfly Hudsonema	6	6.5	0	0	R	R	0	0	R	A	0	0	0
Caddisfly Hydrobiosella	9	7.6	0	0	0	0	R	0	0	0	0	0	0
Caddisfly Hydrobiosis	5	6.7	R	R	A	C	C	0	R	A	C	0	0
Caddisfly Hydrochorema	9	9	0	0	0	0	0	0	0	0	R	0	0
Caddisfly Kokiria	9	9	0	0	0	0	0	0	0	0	0	0	0
Caddisfly Neurochorema	6	6	0	0	C	R	R	0	0	0	R	0	0
Caddisfly Oecetis	6	6.8	0	R	0	0	0	0	0	0	0	0	0
Caddisfly Oeconesidae	9	6.4	0	0	0	0	0	0	0	0	0	0	0
Caddisfly Olinga	9	7.9	R	R	A	A	A	0	0	0	A	0	0
Caddisfly Orthopsyche	9	7.5	0	0	0	0	0	0	0	0	0	0	0
Caddisfly Oxyethira	2	1.2	0	R	0	0	0	A	R	C	0	0	0
Caddisfly Paroxyethira	2	3.7	0	0	0	0	0	R	R	R	0	0	0
Caddisfly Philorheithrus	8	5.3	0	0	0	0	0	0	0	0	0	0	0
Caddisfly Plectrocnemia	8	6.6	0	0	R	0	0	0	0	0	0	0	0
Caddisfly Polyplectropus	8	8.1	0	0	0	0	0	0	0	0	0	0	0
Caddisfly Psilochorema	8	7.8	R	0	C	R	R	0	C	C	C	0	0
Caddisfly Pycnocentrella	9	9	0	0	0	0	0	0	0	0	0	0	0
Caddisfly Pycnocentria	7	6.8	A	0	C	C	C	0	R	C	0	0	0
Caddisfly Pycnocentroides	5	3.8	A	VA	C	A	C	0	VA	VA	VA	0	0

Caddisfly Tiphobiosis	6	9.3	0	0	0	0	0	0	0	0	0	0	0
Caddisfly Triplectides	5	5.7	0	0	0	0	0	0	0	0	0	0	0
Caddisfly Zelolessica	10	6.5	0	0	0	0	0	0	0	0	0	0	0
Damselfly Austrolestes	6	0.7	0	0	0	0	0	0	0	0	0	0	0
Damselfly Ischnura	6	3.1	0	0	0	0	0	0	0	0	0	0	R
Damselfly Xanthocnemis	5	1.2	0	0	0	0	0	R	0	0	0	0	R
Dragonfly Aeshnidae	5	1.4	0	0	0	0	0	0	0	0	0	0	0
Dragonfly Antipodochlora	6	6.3	0	0	0	0	0	0	0	0	0	0	0
Dragonfly Hemicordulia	5	0.4	0	0	0	0	0	0	0	0	0	0	0
Dragonfly Procordulia	6	3.8	0	0	0	0	0	0	0	0	0	0	0
Bug Anisops	5	2.2	0	0	0	0	0	0	0	0	0	0	0
Bug Diaprepocoris	5	4.7	0	0	0	0	0	0	0	0	0	0	0
Bug Mesovelia	5	5	0	0	0	0	0	0	0	0	0	0	0
Bug Microvelia	5	4.6	0	0	0	0	0	0	R	R	0	R	
Bug Saldidae	5	3.9	0	0	0	0	0	0	0	0	0	0	0
Bug Sigara	5	2.4	R	0	0	0	0	0	C	A	0	C	
Dobsonfly Archichauliodes	7	7.3	R	C	VA	R	A	0	0	R	A	0	
Scorpionfly Nannochorista	7	7	0	0	0	0	0	0	0	0	0	0	0
Lacewing Kempynus	5	5	0	0	0	0	0	0	0	0	0	0	0
Lacewing Sisyra	5	5	0	0	0	0	0	0	0	0	0	0	0
Beetle Antiporus	5	3.5	0	0	0	0	0	0	0	0	0	0	0

Beetle Berosus	5	5	0	C	0	0	0	R	0	C	R	0
Beetle Dytiscidae	5	0.4	0	0	0	0	0	0	0	0	0	0
Beetle Elmidae	6	7.2	A	VA	VA	A	VA	A	0	VA	VA	0
Beetle Hydraenidae	8	6.7	0	0	R	R	0	0	0	0	0	0
Beetle Hydrophilidae	5	8	0	0	0	0	0	0	0	0	0	0
Beetle Liodessus	5	4.9	0	0	0	0	0	0	0	0	0	0
Beetle Ptilodactylidae	8	7.1	0	0	0	0	0	0	0	0	0	0
Beetle Rhantus	5	1	0	0	0	0	0	0	0	0	0	0
Beetle Scirtidae	8	6.4	0	0	0	0	0	0	0	0	0	0
Beetle Staphylinidae	5	6.2	0	0	0	0	0	0	0	0	0	0
True Fly Aphrophila	5	5.6	0	0	C	0	R	0	0	0	C	0
True Fly Austrosimulium	3	3.9	R	0	A	C	R	0	A	R	C	0
True Fly Blephariceridae	7	7	0	0	0	0	0	0	0	0	0	0
True Fly Ceratopogonidae	3	6.2	0	0	R	0	0	0	0	0	0	0
True Fly Chironomus	1	3.4	0	A	0	0	0	0	0	0	0	R
True Fly Corynoneura	2	1.7	0	0	0	0	0	0	0	0	0	0
True Fly Culicidae	3	1.2	0	0	0	0	0	0	0	0	0	0
True Fly Dolichopididae	3	8.6	0	0	0	0	0	0	0	0	0	0
True Fly Empididae	3	5.4	0	R	R	0	0	0	0	0	0	0
True Fly Ephydriidae	4	1.4	0	0	0	0	0	R	0	0	0	0
True Fly Eriopterini	9	7.5	R	R	C	0	R	0	0	0	R	0
True Fly Harrisius	6	4.7	0	0	0	0	0	0	0	0	0	0

True Fly Hexatomini	5	6.7	0	0	0	0	0	0	0	0	0	0	0
True Fly Limonia	6	6.3	0	0	0	0	0	0	0	0	0	0	0
True Fly Lobodiamesa	5	7.7	0	0	0	0	0	0	0	0	0	0	0
True Fly Maoridiamesa	3	4.9	0	0	R	0	0	0	0	R	R	0	0
True Fly Mischoderus	4	5.9	0	0	0	0	0	0	0	0	0	0	0
True Fly Molophilus	5	6.3	0	0	0	0	0	0	0	0	0	0	0
True Fly Muscidae	3	1.6	0	0	R	0	R	R	0	C	0	0	0
True Fly Nothodixa	4	9.3	0	0	0	0	0	0	0	0	0	0	0
True Fly Orthoclaadiinae	2	3.2	C	R	A	VA	R	R	R	A	A	R	0
True Fly Paradixa	4	8.5	0	0	0	0	0	0	0	0	0	0	0
True Fly Paralimnophila	6	7.4	0	0	0	0	0	0	0	0	0	0	0
True Fly Paucispinigera	6		0	0	0	0	0	0	0	0	0	0	0
True Fly Pelecorhynchidae	9	9	0	0	0	0	0	0	0	0	0	0	0
True Fly Podominae	8	6.4	0	0	0	0	0	0	0	0	0	0	0
True Fly Polypedilum	3	8	0	0	0	0	R	0	0	0	0	0	0
True Fly Psychodidae	1	6.1	0	0	0	0	0	0	0	0	0	0	R
True Fly Sciomyzidae	3	3	0	0	0	0	0	0	0	0	0	0	0
True Fly Stictocladus	8	8	0	R	0	0	0	0	0	0	R	0	0
True Fly Stratiomyidae	5	4.2	0	R	0	0	0	0	0	0	0	0	0
True Fly Syrphidae	1	1.6	0	0	0	0	0	0	0	0	0	0	0
True Fly Tabanidae	3	6.8	0	0	0	0	0	R	0	0	0	0	0
True Fly Tanypodinae	5	6.5	0	C	R	0	R	R	R	A	A	0	0

True Fly Tanytarsini	3	4.5	C	VA	R	R	R	0	R	VVA	A	0
True Fly Thaumaleidae	9	8.8	0	0	0	0	0	0	0	0	0	0
True Fly Zelandotipula	6	3.6	0	0	0	0	0	0	0	0	0	0
Moth Hygraula	4	1.3	0	0	0	0	0	R	0	0	0	0
Collembola	6	5.3	0	0	0	0	0	0	0	0	0	0
Crustacea Cladocera	5	0.7	0	0	0	0	0	0	0	0	0	0
Crustacea Copepoda	5	2.4	0	0	0	0	0	0	R	0	0	0
Crustacea Halicarcinus crabs	3	5.1	0	0	0	0	0	0	0	0	0	0
Crustacea Helice crabs	3	6.6	0	0	0	0	0	0	0	0	0	0
Crustacea Isopoda	5	4.5	0	0	0	0	0	0	0	0	0	0
Crustacea Melita amphipod	5	5	0	0	0	0	0	0	0	0	0	0
Crustacea Mysid shrimps	5	6.4	0	0	0	0	0	0	0	0	0	0
Crustacea Ostracoda	3	1.9	0	R	0	0	0	R	VA	A	0	R
Crustacea Paracalliope	5	5	0	0	0	0	0	R	VA	0	0	0
Crustacea Paraleptamphopus	5	5	0	0	0	0	0	0	0	0	0	0
Crustacea Paranephrops	5	8.4	0	0	0	0	0	0	0	0	0	0
Crustacea Paranthura	5	4.9	0	0	0	0	0	0	0	0	0	0
Crustacea Paratya	5	3.6	0	0	0	0	0	0	0	0	0	0
Crustacea Phreatogammarus	5	5	0	0	0	0	0	0	0	0	0	0
Crustacea Talitridae	5	5	0	0	0	0	0	0	0	0	0	0
Crustacea Tanaidacea	4	6.8	0	0	0	0	0	0	0	0	0	0

MITES	5	5.2	R	C	0	R	R	0	R	R	0	0
SPIDERS Dolomedes	5	6.2	0	0	0	0	0	0	0	0	0	0
TARDIGRADES	4.5	4.5	0	0	0	0	0	0	0	0	0	0
Mollusc Ferrissia	3	2.4	0	0	0	0	0	0	0	0	0	0
Mollusc Glyptophysa	5	0.3	0	0	0	0	0	0	0	0	0	0
Mollusc Gyraulus	3	1.7	R	0	0	0	0	A	A	0	0	0
Mollusc Hyridella	3	6.7	0	0	0	0	0	0	0	0	0	0
Mollusc Latia	3	6.1	0	0	0	0	0	0	0	0	0	0
Mollusc Lymnaeidae	3	1.2	0	0	0	0	0	0	0	0	0	R
Mollusc Melanopsis	3	1.9	0	0	0	0	0	0	0	0	0	0
Mollusc Physella	3	0.1	0	0	0	0	0	C	C	A	0	0
Mollusc Potamopyrgus	4	2.1	A	C	C	R	0	VA	VVA	VA	C	0
Mollusc Sphaeriidae	3	2.9	0	0	0	0	0	0	0	R	0	0
OLIGOCHAETES	1	3.8	A	A	0	0	0	A	C	A	0	VA
LEECHES	3	1.2	0	0	0	0	0	R	0	0	0	R
PADDLEWORMS	3	6.7	0	0	0	0	0	0	0	0	0	0
FLATWORMS	3	0.9	R	0	0	0	0	A	A	C	0	0
Rhabdoceol Flatworms	3	0.9	0	0	0	0	0	0	0	0	0	0
NEMATODES	3	3.1	0	R	0	0	0	0	0	R	0	0
NEMERTEANS	3	1.8	R	C	0	0	0	R	0	R	0	0
NEMATOMORPHS	3	4.3	0	0	0	0	0	0	0	0	0	0
HYDROIDS	3	1.6	0	0	0	0	0	0	0	0	0	0
BRYOZOA	4	4	0	0	0	0	0	0	0	0	0	0

			0	0	0	0	0	0	0	0	0	0
Number of Taxa			22	25	31	24	28	20	24	31	29	11
EPT Value			9	8	17	16	17	2	9	11	17	0
% EPT (taxa number)			0	0	1	1	1	0	0	0	1	0
MCI Value			107.3	96.8	123.2	132.5	130.0	69.0	85.0	89.0	131.0	63.6

Table 8.4.3.3 (C): Hawkes Bay macro invertebrate data 20-28 of 28 sites evaluated as part of regular sampling program. Codes used by the Regional Council are R – rare, C – common, A – abundant, VA – very abundant, VVA – very very abundant. For generation of MDS plots, codes were transformed by assigning values to each code as follows R – 1, C – 2, A – 3, VA – 4, and VVA – 5.

Site name			Ruakituri River @ sportsground	Taharua @ Poronui	Te Iringaowhare @ Tukurangi	Tuki Tuki @ Black Bridge	Tuki Tuki @ Red Bridge	Tuki Tuki @ SH50	Tuki Tuki @ Shag Rock	Tukipo @ SH50 POORLY PRESERVED	Tutaekuri River @ lawrence Hut
Site ID No.			336	2442	341	15	407	356	2403	144	272
Sample No.			37902	30866	37909	38006	38001	38003	38002	38004	37921
Taxa	MCI	MCI-sb	0	0	0	0	0	0	0	0	0
	score	score	0	0	0	0	0	0	0	0	0
Mayfly Acanthophlebia	7	9.6	0	0	0	0	0	0	0	0	R
Mayfly Ameletopsis	10	10	0	0	0	0	0	0	0	0	0
Mayfly Arachnocolus	8	8.1	0	0	0	0	0	0	0	0	0
Mayfly Atalophlebioides	9	4.4	0	0	0	0	0	0	0	0	0
Mayfly Austroclima	9	6.5	A	VA	0	0	0	0	0	0	0
Mayfly Austronella	7	4.7	0	0	0	0	0	0	0	0	0
Mayfly Coloburiscus	9	8.1	C	A	0	0	0	0	0	0	A
Mayfly Deleatidium	8	5.6	A	C	R	0	0	VA	VA	0	VA
Mayfly Ichthybotus	8	9.2	0	0	0	0	0	0	0	0	R
Mayfly Isothraulius	8	7.1	0	0	0	0	0	0	0	0	0
Mayfly Mauiulus	5	4.1	A	0	C	0	0	0	0	0	0
Mayfly Neozephlebia	7	7.6	0	0	0	0	0	0	0	0	0
Mayfly Nesameletus	9	8.6	0	C	R	0	0	0	0	0	C

Mayfly Oniscigaster	10	5.1	0	0	0	0	0	0	0	0	0	0
Mayfly Rallidens	9	3.9	0	0	0	0	0	0	0	0	0	0
Mayfly Siphlaenigma	9	9	0	0	R	0	0	0	0	0	0	0
Mayfly Tepakia	8	7.6	0	0	0	0	0	0	0	0	0	0
Mayfly Zephlebia	7	8.8	C	0	C	0	0	0	0	0	0	0
Stonefly Acroperla	5	5.1	0	0	0	0	0	0	0	0	0	0
Stonefly Austroperla	9	8.4	0	0	0	0	0	0	0	0	0	R
Stonefly Cristaperla	8	8	0	0	0	0	0	0	0	0	0	0
Stonefly Megaleptoperla	9	7.3	0	R	0	0	0	0	0	0	0	R
Stonefly Nesoperla	5	5.7	0	0	0	0	0	0	0	0	0	0
Stonefly Spaniocerca	8	8.8	0	0	0	0	0	0	0	0	0	0
Stonefly Stenoperla	10	9.1	0	0	0	0	0	0	0	0	0	R
Stonefly Taraperla	7	8.3	0	0	0	0	0	0	0	0	0	0
Stonefly Zelandobius	5	7.4	0	VA	0	0	0	0	0	0	0	0
Stonefly Zelandoperla	10	8.9	0	C	0	0	0	0	0	0	0	C
Caddisfly Alloecentrella	9	9	0	0	0	0	0	0	0	0	0	0
Caddisfly Aoteapsyche	4	6	A	R	0	0	R	C	R	0	0	VA
Caddisfly Beraeoptera	8	7	0	R	0	0	0	0	0	0	0	R
Caddisfly Confluens	5	7.2	0	0	0	0	0	0	0	0	0	0
Caddisfly Costachorema	7	7.2	0	R	0	0	0	0	0	0	0	C
Caddisfly Ecnomidae	8	7	0	0	0	0	0	0	0	0	0	0
Caddisfly Edpercivalia	9	6.3	0	0	0	0	0	0	0	0	0	0

Caddisfly Helicopsyche	10	8.6	0	0	0	0	0	0	0	0	0	0
Caddisfly Hudsonema	6	6.5	C	0	R	0	0	R	0	C	R	
Caddisfly Hydrobiosella	9	7.6	0	0	0	0	0	0	0	0	0	0
Caddisfly Hydrobiosis	5	6.7	C	C	0	0	0	C	R	0	C	
Caddisfly Hydrochorema	9	9	0	0	0	0	0	0	0	0	0	0
Caddisfly Kokiria	9	9	0	0	0	0	0	0	0	0	0	0
Caddisfly Neurochorema	6	6	R	R	0	0	0	0	0	0	0	R
Caddisfly Oecetis	6	6.8	R	0	0	0	0	0	0	0	0	0
Caddisfly Oeconesidae	9	6.4	0	0	0	0	0	0	0	0	0	0
Caddisfly Olinga	9	7.9	A	R	R	0	0	R	0	C	VA	
Caddisfly Orthopsyche	9	7.5	0	R	0	0	0	0	0	0	0	0
Caddisfly Oxyethira	2	1.2	0	0	0	C	R	0	R	R		0
Caddisfly Paroxyethira	2	3.7	0	0	0	A	C	0	0	0	0	0
Caddisfly Philorheithrus	8	5.3	0	0	0	0	0	0	0	0	0	0
Caddisfly Plectrocnemia	8	6.6	0	0	0	0	0	0	0	0	0	0
Caddisfly Polypsectropus	8	8.1	0	0	R	0	0	0	0	0	0	0
Caddisfly Psilochorema	8	7.8	R	R	0	0	0	R	0	0	0	A
Caddisfly Pycnocentrella	9	9	0	0	0	0	0	0	0	0	0	0
Caddisfly Pycnocentria	7	6.8	A	VA	VA	0	0	0	0	R	R	
Caddisfly Pycnocentroides	5	3.8	VA	A	R	0	R	C	C	A	A	

Caddisfly Tiphobiosis	6	9.3	0	0	0	0	0	0	0	0	0	0
Caddisfly Triplectides	5	5.7	R	0	A	0	0	0	0	0	0	0
Caddisfly Zelolessica	10	6.5	0	0	R	0	0	0	0	0	0	0
Damselfly Austrolestes	6	0.7	0	0	0	0	0	0	0	0	0	0
Damselfly Ischnura	6	3.1	0	0	0	0	0	0	0	0	0	0
Damselfly Xanthocnemis	5	1.2	0	0	0	R	0	0	0	0	0	0
Dragonfly Aeshnidae	5	1.4	0	0	0	0	0	0	0	0	0	0
Dragonfly Antipodochlora	6	6.3	0	0	0	0	0	0	0	0	0	0
Dragonfly Hemicordulia	5	0.4	0	0	0	0	0	0	0	0	0	0
Dragonfly Procordulia	6	3.8	0	0	0	0	0	0	0	0	0	0
Bug Anisops	5	2.2	0	0	0	0	0	0	0	0	0	0
Bug Diaprepocoris	5	4.7	0	0	0	0	0	0	0	0	0	0
Bug Mesovelia	5	5	0	0	0	0	0	0	0	0	0	0
Bug Microvelia	5	4.6	0	0	A	0	0	0	0	0	0	0
Bug Saldidae	5	3.9	0	0	0	0	0	0	0	0	0	0
Bug Sigara	5	2.4	R	0	A	0	R	0	0	R	0	0
Dobsonfly Archichauliodes	7	7.3	A	RR	R	0	0	C	0	0	0	VA
Scorpionfly Nannochorista	7	7	0	0	0	0	0	0	0	0	0	0
Lacewing Kempynus	5	5	0	0	0	0	0	0	0	0	0	0
Lacewing Sisyra	5	5	0	0	0	0	0	0	0	0	0	0

Beetle Antiporus	5	3.5	0	0	0	0	0	0	0	0	0	0
Beetle Berosus	5	5	0	0	0	R	R	0	R	R	0	0
Beetle Dytiscidae	5	0.4	0	0	0	0	0	0	0	0	0	0
Beetle Elmidae	6	7.2	C	VA	0	R	C	A	VA	A	VA	0
Beetle Hydraenidae	8	6.7	0	R	0	0	0	0	0	0	0	0
Beetle Hydrophilidae	5	8	0	0	0	0	0	0	A	0	0	0
Beetle Liodessus	5	4.9	0	0	0	0	0	0	0	0	0	0
Beetle Ptilodactylidae	8	7.1	0	0	0	0	0	0	0	0	0	0
Beetle Rhantus	5	1	0	0	0	0	0	0	0	0	0	0
Beetle Scirtidae	8	6.4	0	0	0	0	0	0	0	0	0	0
Beetle Staphylinidae	5	6.2	0	0	0	0	0	0	0	0	0	0
True Fly Aphrophila	5	5.6	R	0	0	0	0	R	0	0	0	A
True Fly Austrosimulium	3	3.9	0	C	R	0	0	R	0	0	0	A
True Fly Blephariceridae	7	7	0	0	0	0	0	0	0	0	0	0
True Fly Ceratopogonidae	3	6.2	0	R	0	0	0	0	0	0	0	R
True Fly Chironomus	1	3.4	0	0	C	C	0	0	A	R	0	0
True Fly Corynoneura	2	1.7	0	0	0	0	0	0	0	0	0	0
True Fly Culicidae	3	1.2	0	0	0	0	0	0	0	0	0	0
True Fly Dolichopididae	3	8.6	0	0	0	0	0	0	0	0	0	0
True Fly Empididae	3	5.4	0	0	0	0	0	0	0	0	0	0
True Fly Ephydriidae	4	1.4	0	0	0	0	0	0	R	0	0	0
True Fly Eriopterini	9	7.5	R	R	0	0	0	C	0	0	0	A

True Fly Harrisius	6	4.7	0	0	0	0	0	0	0	0	0	0
True Fly Hexatomini	5	6.7	0	0	0	0	0	0	0	0	0	0
True Fly Limonia	6	6.3	0	0	0	0	0	0	0	0	0	0
True Fly Lobodiamesa	5	7.7	0	0	0	0	0	0	0	0	0	0
True Fly Maoridiamesa	3	4.9	0	R	0	0	0	0	0	0	0	0
True Fly Mischoderus	4	5.9	0	0	0	0	0	0	0	0	0	0
True Fly Molophilus	5	6.3	0	0	0	0	0	R	0	0	0	0
True Fly Muscidae	3	1.6	0	R	0	0	0	R	0	0	0	0
True Fly Nothodixa	4	9.3	0	0	0	0	0	0	0	0	0	0
True Fly Orthoclaadiinae	2	3.2	A	A	R	VA	C	0	VA	R	R	
True Fly Paradixa	4	8.5	0	0	A	0	0	0	0	0	0	0
True Fly Paralimnophila	6	7.4	0	0	0	0	0	0	0	0	0	0
True Fly Paucispinigera	6		0	0	0	0	0	0	0	0	0	0
True Fly Pelecorhynchidae	9	9	0	0	0	0	0	0	0	0	0	0
True Fly Podominae	8	6.4	0	0	0	0	0	0	0	0	0	0
True Fly Polypedilum	3	8	0	0	R	0	0	0	0	0	0	0
True Fly Psychodidae	1	6.1	0	0	R	0	0	0	0	0	0	0
True Fly Sciomyzidae	3	3	0	0	0	0	0	0	0	0	0	0
True Fly Stictocladus	8	8	0	0	0	0	0	0	0	0	0	0
True Fly Stratiomyidae	5	4.2	0	0	R	0	0	0	0	0	0	0
True Fly Syrphidae	1	1.6	0	0	0	0	0	0	0	0	0	0
True Fly Tabanidae	3	6.8	0	0	0	0	0	0	0	0	0	0

True Fly Tanypodinae	5	6.5	C	0	C	0	0	0	C	0	0
True Fly Tanytarsini	3	4.5	C	A	R	A	VA	R	A	R	A
True Fly Thaumaleidae	9	8.8	0	0	0	0	0	0	0	0	0
True Fly Zelandotipula	6	3.6	0	0	0	0	0	0	0	0	0
Moth Hygraula	4	1.3	0	0	0	0	0	0	0	0	0
Collembola	6	5.3	0	0	R	0	0	0	0	0	0
Crustacea Cladocera	5	0.7	0	0	0	0	0	0	0	C	0
Crustacea Copepoda	5	2.4	0	0	0	R	R	0	0	0	0
Crustacea Halicarcinus crabs	3	5.1	0	0	0	0	0	0	0	0	0
Crustacea Helice crabs	3	6.6	0	0	0	0	0	0	0	0	0
Crustacea Isopoda	5	4.5	0	0	0	0	0	0	0	0	0
Crustacea Melita amphipod	5	5	0	0	0	0	0	0	0	0	0
Crustacea Mysid shrimps	5	6.4	0	0	0	0	0	0	0	0	0
Crustacea Ostracoda	3	1.9	R	0	R	0	VA	0	VVA	C	0
Crustacea Paracalliope	5	5	0	0	0	C	C	0	R	0	0
Crustacea Paraleptamphopus	5	5	0	0	0	R	0	0	0	0	0
Crustacea Paranephrops	5	8.4	0	0	0	0	0	0	0	0	0
Crustacea Paranthura	5	4.9	0	0	0	0	0	0	0	0	0
Crustacea Paratya	5	3.6	0	0	0	R	0	0	0	0	0
Crustacea	5	5	0	0	0	0	0	0	0	0	0

Phreatogammarus												
Crustacea Talitridae	5	5	0	0	0	0	0	0	0	0	0	0
Crustacea Tanaidacea	4	6.8	0	0	0	0	0	0	0	0	0	0
MITES	5	5.2	R	0	R	R	R	R	R	0	0	0
SPIDERS Dolomedes	5	6.2	0	0	R	0	0	0	0	0	0	R
TARDIGRADES	4.5	4.5	0	0	0	0	0	0	0	0	0	0
Mollusc Ferrissia	3	2.4	0	0	0	0	0	0	0	0	0	0
Mollusc Glyptophysa	5	0.3	0	0	0	0	0	0	0	0	0	0
Mollusc Gyraulus	3	1.7	0	0	0	0	C	0	R	0	0	0
Mollusc Hyridella	3	6.7	0	0	0	0	0	0	0	0	0	0
Mollusc Latia	3	6.1	0	0	0	0	0	0	0	0	0	0
Mollusc Lymnaeidae	3	1.2	0	0	0	0	0	0	0	0	0	0
Mollusc Melanopsis	3	1.9	0	0	0	0	0	0	0	0	0	0
Mollusc Physella	3	0.1	R	0	0	R	VA	0	A	0	0	0
Mollusc Potamopyrgus	4	2.1	VA	A	A	VA	VVA	R	VA	A	0	0
Mollusc Sphaeriidae	3	2.9	0	0	0	0	0	0	0	C	0	0
OLIGOCHAETES	1	3.8	C	0	A	A	A	0	C	C	0	0
LEECHES	3	1.2	0	0	0	R	0	0	0	0	0	0
PADDLEWORMS	3	6.7	0	0	0	R	0	0	0	0	0	0
FLATWORMS	3	0.9	0	0	0	C	C	0	C	0	0	0
Rhabdoceol Flatworms	3	0.9	0	0	0	0	0	0	0	0	0	0
NEMATODES	3	3.1	0	0	0	R	0	R	R	0	0	0
NEMERTEANS	3	1.8	0	0	0	0	C	0	R	0	0	0

NEMATOMORPHS	3	4.3	0	0	0	0	0	0	0	0	0
HYDROIDS	3	1.6	0	0	0	0	0	0	0	0	0
BRYOZOA	4	4	0	0	0	0	0	0	0	0	0
			0	0	0	0	0	0	0	0	0
Number of Taxa			28	28	30	20	19	18	23	16	28
EPT Value			15	17	12	2	4	7	5	5	19
% EPT (taxa number)			1	1	0	0	0	0	0	0	1
MCI Value			112.1	127.1	104.0	71.0	72.6	108.9	76.5	83.8	133.6

8.5.3.4 Hawkes Bay Regional council: Water quality data of stream sites investigated for the BCI project

Table 8.5.3.4: Hawkes Bay Regional Council: Water quality data of stream sites.

SiteID	SiteDesc	Easting	Northing	BCI sampled	LabID	DO (mg/L)	PH Field	PH LAB	Water Temp (celcius)	Water temp (BCI sampling)
3	Mohaka River at Raupunga	2868145	6227701	24.2.2010	39824	10.46	8.54	8.3	19.45	
9	Esk River at Waipunga Bridge	2839017	6195088	26.2.2010	39811	14.28	8.47	8.2	15.84	
14	Porangahau River at SH52 Opposite kates Quarry now transfer station	2814330	6094858	1.4.2010	39762	13.58		8.2	19.7	
14	Porangahau River at SH52 Opposite kates Quarry now transfer station	2814330	6094858	1.4.2010	40255	11.11	7.65		10.8	
15	Tukituki River at Black Bridge	2847566	6170374	19.3.2010	40047	6.9	7.77	7.6	18.8	17
19	Makaretu Stream @ SH 50	2793612	6126919	19.3.2010	40054	6.98	8.59	8.4	17.5	18.4
144	Tukipo River at State Highway 50	2794766	6132380	19.3.2010	40053	6.92	8.59	8.4	16.79	18.9
266	Mangaone river at Rissington @ gauge station	2830061	6189373	3.3.2010	39747	13.61	8.14	8.2	16.14	
272	Tutaekuri river @ Lawrence hut	2806267	6198041	3.3.2010	39744	16.62	7.67	8	13.46	
277	Mangatarata stream u/s Tukituki river confluence @ Mangatarata road bridge	2819614	6128052	19.3.2010	40056	8.14	8.48	8.4	18.23	18.2
280	Waipawa river at SH 50	2804722	6143515	19.3.2010	40051	6.19	7.71	7.9	17.68	19
284	Mangaonuku stream u/s Waipawa river	2811298	6138276	19.3.2010	40050	7.65	7.8	7.7	16.38	17.2

	at Tikokino road									
319	Anaura stream at Skudders road	2852927	6231439	24.2.2010	39825	8.83	8.29	8.2	16.64	
321	Mokomokonui river u/s Waipunga river confluence @ Tartraakina road	2820627	6233249	24.2.2010	39819	10.62	8.61	7.5	14.6	
333	Aniwaniwa stream @ State Highway 38 @ gauge station	2872485	6265307		39632	9.8	8.32	7.9	14.7	12
336	Ruakituri river @ sports ground @ gauge station	2899233	6255617		39636	9.4	8.67	8.2	20.8	15
337	Hangaroa river @ Donneraille Park @ gauge station	2908476	6264297	30.3.2010	39637	9.2	9.12	8.5	22.7	15
341	Te Iringaowhare stream @ Tukurangi road	2877604	6245144	31.3.2010	39635	9.2	8.85	8.3	17.8	14
356	Tukituki river @ Ashcott road SH50	2796308	6135724	19.3.2010	40052	5.33	8	7.7	17.87	19.5
394	Puhokio stream at Te Apiti road	2850686	6145640	23.2.2010	39809	8.79	8.32	8.3	17.68	17.68
397	Porangahau stream at Oruawhara road	2797667	6125806	19.3.2010	39738	10.6	8.65	8.2	18.7	
397	Porangahau stream at Oruawhara road	2797667	6125806	19.3.2010	40055	8.71	8.2	8.2	16.94	
407	Tukituki river at Red Bridge	2846674	6158087	19.3.2010	40048	7.94	8.09	7.8	18.22	17.3
595	Mohaka river at Willowflat	2851834	6237001	24.2.2010	39826	8.72	8.28	8	18.27	18.27
604	Ripia river u/s Mohaka River confluence	2814304	6218380	24.2.2010	39816	11.08	7.84	7.2	15.77	
1319	Waikaretaheke river @ Terapataki bridge crossing	2873735	6252356	31.3.2010	39634	9.8	8.55	8	18.5	14

2403	Tukituki River @ Shag Rock gauge station	2826307	6133014	19.3.2010	40049	6.35	8.33	7.9	17.24	17.6
2414	Mangakuri Stream @ 1 km u/s Mangakuri/ Pourerere road bridge (Site 349)	2843587	6130501	1.4.2010	39761	10.27	8.07	8.2	19.92	
2414	Mangakuri Stream @ 1 km u/s Mangakuri/ Pourerere road bridge (Site 349)	2843587	6130501	1.4.2010	40254	9.28	7.44		10.1	
2442	Taharua River @ Poronui Station/Bottom site	2794735	6238237	25.2.2010	39804	10.6	7.61	7.1	13	
2961	Mohaka u/s Taharua conflu	2793572	6230988	25.2.2010	39803	9.48	7.6	7.2	15.2	
3118	Mangarau @ Keirunga Road	2843288	6162028	2.2.2010	39623	8.63		8	18.92	18.9
3119	Ruahapia @ Show Grounds	2841627	6168096	2.2.2010	39622	4.44		7.4	20.12	20.12
3120	Mangarau Stream @ Te Aute Road	2842192	6163233	2.2.2010	39621	8.51		7.8	18.9	18.9
3121	Here Here @ Te Aute road	2841599	6163117	2.2.2010	39620	5.91		7.8	18.93	18.9
3152	Mohaka d/s Taharua conflu	2796134	6230508	25.2.2010	39801	10.5	7.64	7.3	14	

8.5.4 Horizons (Manawatu - Wanganui) Regional Council

8.5.4.1 Sample storage: Stream identifier codes

Table 8.5.4.1: Horizons (Manawatu - Wanganui) Regional Council: Sample labeling with stream identifier codes.

	STREAM	SHORT CODE LABEL	STREAM IDENTIFIER #
1	Mangatainoka at SH2 bridge	MAN1	HR10_MAN1
2		MAN2	HR10_MAN2
3		MAN3	HR10_MAN3
4		MAN4	HR10_MAN4
5		MAN5	HR10_MAN5
6	Hokio stream at Lake outlet	HOK1	HR10_HOK1
7		HOK2	HR10_HOK2
8		HOK3	HR10_HOK3
9		HOK4	HR10_HOK4
10		HOK5	HR10_HOK5
11	Whanganui d/s of Retaruke	WG1	HR10_WG1
12		WG2	HR10_WG2
13		WG3	HR10_WG3
14		WG4	HR10_WG4
15		WG5	HR10_WG5
16	Makotuku u/s Raetihi	MAK1	HR10_MAK1
17		MAK2	HR10_MAK2
18		MAK3	HR10_MAK3
19		MAK4	HR10_MAK4
20		MAK5	HR10_MAK5
21	Porewa at Onepuhi	PR1	HR10_PR1
22		PR2	HR10_PR2
23		PR3	HR10_PR3
24		PR4	HR10_PR4

25		PR5	HR10_PR5
26	Oroua at Awahuri	ORO1	HR10_ORO1
27		ORO2	HR10_ORO2
28		ORO3	HR10_ORO3
29		ORO4	HR10_ORO4
30		ORO5	HR10_ORO5
31	Hautapu u/b Rangitiki	HAU1	HR10_HAU1
32		HAU2	HR10_HAU2
33		HAU3	HR10_HAU3
34		HAU4	HR10_HAU4
35		HAU5	HR10_HAU5
36	Manawatu at Hopelands	MW1	HR10_MW1
37		MW2	HR10_MW2
38		MW3	HR10_MW3
39		MW4	HR10_MW4
40		MW5	HR10_MW5
41	Manawatu at Weber	MWB1	HR10_MWB1
42		MWB2	HR10_MWB2
43		MWB3	HR10_MWB3
44		MWB4	HR10_MWB4
45		MWB5	HR10_MWB5
46	Manawatu at Upper Gorge	MUG1	HR10_MUG1
47		MUG2	HR10_MUG2
48		MUG3	HR10_MUG3
49		MUG4	HR10_MUG4
50		MUG5	HR10_MUG5
51	Pohangina at Piripiri	PHP1	HR10_PHP1
52		PHP2	HR10_PHP2
53		PHP3	HR10_PHP3
54		PHP4	HR10_PHP4
55		PHP5	HR10_PHP5
56	Oruakeretaki at SH2	OK1	HR10_OK1

57		OK2	HR10_OK2
58		OK3	HR10_OK3
59		OK4	HR10_OK4
60		OK5	HR10_OK5
61	Manawatu at Teachers College	MTC1	HR10_MTC1
62		MTC2	HR10_MTC2
63		MTC3	HR10_MTC3
64		MTC4	HR10_MTC4
65		MTC5	HR10_MTC5
66	Brandscombe bridge	BR1	HR10_BR1
67		BR2	HR10_BR2
68		BR3	HR10_BR3
69		BR4	HR10_BR4
70		BR5	HR10_BR5
71	Tamaki at Reserve	TAM1	HR10_TAM1
72		TAM2	HR10_TAM2
73		TAM3	HR10_TAM3
74		TAM4	HR10_TAM4
75		TAM5	HR10_TAM5
76	Rangitikei at Pukeokahu	RG1	HR10_RG1
77		RG2	HR10_RG2
78		RG3	HR10_RG3
79		RG4	HR10_RG4
80		RG5	HR10_RG5
81	Oroua at Almadale	OAL1	HR10_OAL1
82		OAL2	HR10_OAL2
83		OAL3	HR10_OAL3
84		OAL4	HR10_OAL4
85		OAL5	HR10_OAL5
86	Oroua at Apiti gorge	OAG1	HR10_OAG1
87		OAG2	HR10_OAG2
88		OAG3	HR10_OAG3

89		OAG4	HR10_OAG4
90		OAG5	HR10_OAG5
91	Rangitikei at McKelvies	RM1	HR10_RM1
92		RM2	HR10_RM2
93		RM3	HR10_RM3
94		RM4	HR10_RM4
95		RM5	HR10_RM5
96	Mangawhero at Doc HQ	MD1	HR10_MD1
97		MD2	HR10_MD2
98		MD3	HR10_MD3
99		MD4	HR10_MD4
100		MD5	HR10_MD5
101	Mangatainoka at Putara	MP1	HR10_MP1
102		MP2	HR10_MP2
103		MP3	HR10_MP3
104		MP4	HR10_MP4
105		MP5	HR10_MP5
106	Manawatu at Opiki	MO1	HR10_MO1
107		MO2	HR10_MO2
108		MO3	HR10_MO3
109		MO4	HR10_MO4
110		MO5	HR10_MO5
111	Tiraumea at Ngaturi	TIR1	HR10_TIR1
112		TIR2	HR10_TIR2
113		TIR3	HR10_TIR3
114		TIR4	HR10_TIR4
115		TIR5	HR10_TIR5
116	Whanganui at Pipiriki	WH1	HR10_WH1
117		WH2	HR10_WH2
118		WH3	HR10_WH3
119		WH4	HR10_WH4
120		WH5	HR10_WH5

121	Mangawhero at Pakihi Road bridge	MWP1	HR10_MWP1
122		MWP2	HR10_MWP2
123		MWP3	HR10_MWP3
124		MWP4	HR10_MWP4
125		MWP5	HR10_MWP5
126	Whanganui at Cherry grove	WC1	HR10_WC1
127		WC2	HR10_WC2
128		WC3	HR10_WC3
129		WC4	HR10_WC4
130		WC5	HR10_WC5
131	Whanganui at Te Maire	WT1	HR10_WT1
132		WT2	HR10_WT2
133		WT3	HR10_WT3
134		WT4	HR10_WT4
135		WT5	HR10_WT5
136	Hautapu at Alabasters	HT1	HR10_HT1
137		HT2	HR10_HT2
138		HT3	HR10_HT3
139		HT4	HR10_HT4
140		HT5	HR10_HT5
141	Tamaki at Stephenson's	TS1	HR10_TS1
142		TS2	HR10_TS2
143		TS3	HR10_TS3
144		TS4	HR10_TS4
145		TS5	HR10_TS5
146	Manganui - O-Te Ao at Ashworth bridge	MTA1	HR10_MTA1
147		MTA2	HR10_MTA2
148		MTA3	HR10_MTA3
149		MTA4	HR10_MTA4
150		MTA5	HR10_MTA5
151	Tiraumea at Houkopia reserve	TH1	HR10_TH1

152		TH2	HR10_TH2
153		TH3	HR10_TH3
154		TH4	HR10_TH4
155		TH5	HR10_TH5
156	Makuri at Tuscan Hills	MK1	HR10_MK1
157		MK2	HR10_MK2
158		MK3	HR10_MK3
159		MK4	HR10_MK4
160		MK5	HR10_MK5
161	Kahutarawa at Johnstons Rata	KH1	HR10_KH1
162		KH2	HR10_KH2
163		KH3	HR10_KH3
164		KH4	HR10_KH4
165		KH5	HR10_KH5
166	Manawatu at Whirikino	MWW1	HR10_MWW1
167		MWW2	HR10_MWW2
168		MWW3	HR10_MWW3
169		MWW4	HR10_MWW4
170		MWW5	HR10_MWW5
171	Tokiahuru u/s Whangaehu	TK1	HR10_TK1
172		TK2	HR10_TK2
173		TK3	HR10_TK3
174		TK4	HR10_TK4
175		TK5	HR10_TK5
176	Rangitikei at Mangaweka	RMW1	HR10_RMW1
177		RMW2	HR10_RMW2
178		RMW3	HR10_RMW3
179		RMW4	HR10_RMW4
180		RMW5	HR10_RMW5
181	Rangitiki at Onepuhi	RO1	HR10_RO1
182		RO2	HR10_RO2
183		RO3	HR10_RO3

184		RO4	HR10_RO4
185		RO5	HR10_RO5
186	Tokomaru at Horseshoe bend	TKM1	HR10_TKM1
187		TKM2	HR10_TKM2
188		TKM3	HR10_TKM3
189		TKM4	HR10_TKM4
190		TKM5	HR10_TKM5
191	Mangahau at Ballance	MHB1	HR10_MHB1
192		MHB2	HR10_MHB2
193		MHB3	HR10_MHB3
194		MHB4	HR10_MHB4
195		MHB5	HR10_MHB5
196	Mangapapa at Troup road	MPT1	HR10_MPT1
197		MPT2	HR10_MPT2
198		MPT3	HR10_MPT3
199		MPT4	HR10_MPT4
200		MPT5	HR10_MPT5

8.5.4.2 Horizons (Manawatu - Wanganui) Regional Council: Catchment land use data

Table 8.5.4.2: Horizons Regional council: Catchment land use data

Site		Percentage Pasture in Catchment	Dominant surrounding land use/cover
Hautapu River	Alabasters	57	Sheep and/or beef (15650 ha), Native (5630 ha), Unspecified (5766 ha)
Hautapu River	U/S Rangitikei River	66	Sheep and/or beef (25795 ha), Native (6256 ha), Unspecified (5771 ha)
Hokio Stream	Lake outlet @ weir	68	Sheep and/or beef (3178 ha), Dairy (1155 ha), Built up/parks etc. (839 ha)
Kahuterawa Stream	Johnstons Rata	35	Native (1547 ha), Sheep and/or beef (1354 ha), Exotic / forestry (919)
Makotuku River	u/s Raetihi	54	Sheep and/or beef (3173 ha), Native (2467 ha), Dairy (144 ha)
Makuri River	@ Tuscan Hills	80	Sheep and/or beef (10894 ha), Native (2280 ha) Exotic / forestry (331 ha)
Manawatu River	@ Hopelands Reserve	85	Sheep and/or beef (85677 ha), Dairy (20139 ha), Native (12757 ha)
Manawatu River	@ Opiki Bridge	75	Sheep and/or beef (241108 ha), Native (79749 ha), Dairy (51891 ha)
Manawatu River	@ Teachers College	75	Sheep and/or beef (259593 ha), Native (83405 ha), Dairy (58603 ha)
Manawatu River	@ Upper Gorge	79	Sheep and/or beef (203014 ha), Native (54455 ha), Dairy (48377 ha)
Manawatu River	@ Weber Road	88	Sheep and/or beef (55398 ha), Dairy (5470 ha), Native (5285 ha)
Manawatu River	@ Whirokino	76	Sheep and/or beef (343260 ha), Native (101255 ha), Dairy (98958 ha)
Mangahao River	@ Ballance	33	Native (18204 ha), Sheep and/or beef (6590 ha), Dairy (2579 ha)
Mangapapa Stream	@ Troup Rd Bridge	68	Sheep and/or beef (1380 ha), Native (727 ha), Dairy (507 ha)
Mangatainoka River	@ SH2 bridge	77	Sheep and/or beef (20525 ha), Dairy (13162 ha), Native (8798 ha)
Mangatainoka River	@ Putara	0	Native (1055 ha), Exotic Cover (7 ha), Sheep and/or beef (3 ha)
Mangawhero River	@ Pakihi Rd Bridge	50	Sheep and/or beef (7401ha), Native (7293 ha), Other (4 ha)
Mangawhero River	@ DoC Headquarters	10	Native (7208 ha), Sheep and/or beef (798 ha)
Manganui o te Ao	@ Ashworth Bridge	28	Native (25895 ha), Sheep and/or beef (10882 ha), Exotic Cover (1246 ha)

Oroua River	@ Apiti Gorg/e Bridge	27	Native (17722 ha), Sheep and/or beef (5605 ha), Dairy (1418 ha)
Oroua River	@ Awahuri Bridge	79	Sheep and/or beef (50240ha), Native (11478 ha), Dairy (8518 ha)
Oroua River	@ Almadale/	50	Native (18532 ha), Sheep and/or beef (15881 ha), Dairy (4496 ha)
Oruakeretaki	@ SH2	66	Dairy (2328 ha), Native (1750 ha), Sheep and/or beef (1276 ha)
Owahanga River	@ Branscombe Bridge	79	Sheep and/or beef (25906 ha), Native (5345 ha), Exotic cover (1133 ha)
Pohangina River	@ Piripiri	17	Native (21615 ha), Sheep and/or beef (4635 ha), Exotic cover (210 ha)
Porewa Stream	@Onepuhi Rd	87	Sheep and/or beef (11983 ha), Exotic cover (1547 ha), Dairy (969 ha)
Rangitikei River	@ Mangaweka	45	Sheep and/or beef (120722 ha), Native (106643 ha), Other (35141 ha)
Rangitikei River	@ McKelvies	58	Sheep and/or beef (211167 ha), Native (112216 ha), Dairy (14940 ha)
Rangitikei River	@ Onepuhi	53	Sheep and/or beef (168862 ha), Native (110976 ha), Other (35216 ha)
Rangitikei River	@ Pukeokahu	40	Native (40513 ha), Sheep and/or beef (30821 ha), Other (4399 ha)
Tamaki River	@ Stephensons	62	Sheep and/or beef (3115 ha), Native (2792 ha), Dairy (1695 ha)
Tamaki River	@ Reserve	0	Native (1204 ha), Water body (13 ha), Sheep and/or beef (2 ha)
Tiraumea River	@ Haukopua Reserve	81	Sheep and/or beef (94783 ha), Native (20178 ha), Dairy (16129 ha)
Tiraumea River	@ Ngaturi	83	Sheep and/or beef (60155 ha), Native (8248 ha), Exotic Cover (3908 ha)
Tokiahuru Stream	u/s Whangaehu	14	Native (10751 ha), Exotic Cover (9571 ha), Sheep and/or beef (3240 ha),
Tokomaru River	@ Horseshoe bend	15	Native (4303 ha), Sheep and/or beef (806 ha), Exotic Cover (426 ha),
Whanganui River	@ Pipiriki	35	Native (335776 ha), Sheep and/or beef (207353 ha), Exotic Cover (52694 ha)
Whanganui River	@ Te Maire	36	Native (102185 ha), Sheep and/or beef (76695 ha), Exotic Cover (35504 ha)
Whanganui River	@ Cherry Grove	34	Native (100254 ha), Sheep and/or beef (67208 ha), Exotic Cover (34131 ha)
Whanganui River	d/s Retaruke confl	45	Sheep and/or beef (165659 ha), Native (159779 ha), , Exotic Cover (44429 ha)

8.5.4.3 Horizons (Manawatu - Wanganui) Regional Council: Macroinvertebrate data from the 2009 sampling round.

Appendix 8.5.4.3 A: Horizons (Manawatu - Wanganui) Regional Council macro invertebrate data - 2009 sampling round (1-10 of 40 samples).

			HRC2009 SOE02	HRC2009 SOE03	HRC2009 SOE04	HRC2009 SOE05	HRC2009 SOE07	HRC2009 SOE08	HRC2009 SOE09	HRC2009 SOE10	HRC2009 SOE12	HRC2009 SOE11
	Horizons SOE 2009		Hautapu River	Hautapu River	Hokio Stream	Kahuterawa Stream	Makotuku River	Makuri River	Manawatu River	Manawatu River	Manawatu River	Manawatu River
	Subsampled		Alabasters	U/S Rangitikei River	Lake outlet @ weir	Johnstons Rata	u/s Raetihi	Tuscan Hills	Hopelands Reserve	Weber Road	Whirokino	Opiki Bridge
	(% counted in cell comment)	Easting	2748600	2753000	2699200	2730000	2706500	2758300	2761500	2774700	2702200	2719500
	Animals in 2 vials	Northing	6168300	6157400	6064400	6087000	6195700	6071700	6089800	6102600	6074700	6082700
	Mayflies											
	<i>Austroclima sepi</i>	9	-	-	-	-	1	11	1	-	-	1
1	<i>Austroclima</i> sp.	9	-	-	-	-	-	-	-	-	-	-
2	<i>Coloburiscus humeralis</i>	9	1	-	-	-	-	1	-	-	-	-
3	<i>Deleatidium</i> sp.	8	-	-	-	17	-	1	3	1	-	6
4	<i>Nesameletus ornatus</i>	9	-	-	-	1	-	-	-	-	-	-
5	<i>Nesameletus</i> sp.	9	-	-	-	-	-	-	-	-	-	-
6	<i>Zephlebia dentata</i>	7	-	-	-	-	-	-	-	-	-	-
7	<i>Zephlebia inconspicua</i>	7	-	-	-	-	-	-	-	-	-	-
8	<i>Zephlebia</i> sp.	7	-	-	-	-	-	-	-	1	-	-
9	Stoneflies											

	<i>Acroperla trivacuata</i>	5	-	-	-	-	-	-	-	-	-	-
10	<i>Austroperla cyrene</i>	9	-	-	-	-	2	-	-	-	-	-
11	<i>Megaleptoperla diminuta</i>	9	-	-	-	-	-	-	-	-	-	-
12	<i>Megaleptoperla grandis</i>	9	-	-	-	-	-	-	-	-	-	-
13	<i>Stenoperla hendersoni</i>	10	-	-	-	-	-	-	-	-	-	-
14	<i>Stenoperla prasina</i>	10	-	-	-	-	-	-	-	-	-	-
15	<i>Zelandobius furcillatus</i> group	5	-	-	-	-	-	-	-	-	-	-
16	<i>Zelandobius</i> sp.	5	-	-	-	-	-	-	-	-	-	-
17	<i>Zelandoperla decorata</i>	10	-	-	-	9	-	-	-	-	-	-
18	<i>Zelandoperla</i> spp.	10	-	-	-	11	-	-	-	-	-	-
19	Odonata											
	tail-less damselflies		-	-	-	-	-	-	-	2	-	-
20	Water Bugs											
	<i>Microvelia macgregori</i>	5	-	-	-	-	-	-	-	7	-	-
21	<i>Saldula</i> sp.	5	-	-	-	-	-	-	-	-	-	-
22	<i>Sigara</i> sp.	5	-	-	-	-	-	-	-	15	-	-

23	Dobsonflies											
	<i>Archichauliodes diversus</i>	7	5	2	-	7	10	24	1	-	-	-
24	Beetles											
	<i>Berosus</i> sp.	5	-	2	-	-	-	3	6	6	-	-
25	Elmidae	6	39	12	-	23	35	19	15	-	-	2
26	<i>Enochrus</i> sp.	5	-	-	-	-	-	-	-	-	-	-
27	Hydraenidae	8	-	-	-	-	3	-	-	-	-	-
28	Ptilodactylidae	8	-	-	-	-	1	-	-	-	-	-
29	True Flies											
	Anthomyiidae	3	2	20	-	2	-	-	-	-	-	-
30	<i>Aphrophila neozelandica</i>	5	8	-	-	1	1	11	1	-	-	-
31	<i>Austrosimulium</i> spp.	3	-	1	-	5	3	-	-	-	-	-
32	Ceratopogonidae	3	-	-	2	-	-	-	-	-	-	-
33	<i>Chironomus</i> sp. A	1	-	1	-	-	-	-	-	-	-	-
34	<i>Chironomus zelandicus</i>	1	-	-	-	-	-	-	-	-	-	-
35	Empididae	3	12	9	-	-	-	-	-	-	-	-
36	Ephydriidae	4	-	-	-	-	-	1	-	-	-	-
37	Eriopterini	9	-	-	-	2	-	9	-	-	-	-
38	<i>Harrisius pallidus</i>	6	-	-	-	-	-	-	-	-	-	-
39	<i>Lobodiamesa</i> sp.	5	-	-	-	-	-	-	-	-	-	-

40	<i>Maoridiamesa</i> spp.	3	10	30	-	-	1	3	-	-	-	-
41	<i>Molophilus</i> sp.	5	-	-	-	-	1	-	-	-	-	-
42	Orthoclaadiinae	2	8	12	3	41	11	15	22	6	-	-
43	<i>Paradixa</i> sp.	4	-	-	-	-	-	-	-	-	-	-
44	<i>Paralimnophila</i> <i>skusei</i>	6	-	-	-	-	-	-	-	-	-	-
45	<i>Polypedilum</i> spp.	3	-	-	35	2	-	-	-	-	-	-
46	<i>Stictocladus</i> sp.	2	-	-	-	-	-	-	-	-	-	-
47	Tabanidae	3	-	-	-	-	-	18	-	-	-	-
48	Tanyderidae	4	-	-	-	-	-	1	1	-	-	-
49	Tanypodinae	5	1	-	-	1	-	1	-	1	-	-
50	<i>Tanytarsus</i> spp.	3	42	21	-	7	8	11	145	13	-	1
51	Caddisflies											
	<i>Aoteapsyche</i> spp.	4	30	1	-	9	6	11	43	-	-	9
52	<i>Beraeoptera roria</i>	4	-	-	-	-	-	-	-	-	-	-
53	<i>Costachorema</i> <i>xanthopterum</i>	7	2	-	-	7	-	-	-	-	-	-
54	<i>Costachorema</i> spp.	7	-	-	-	10	-	2	-	-	-	-
55	<i>Helicopsyche</i> sp.	10	-	-	-	-	-	-	-	-	-	-
56	<i>Hudsonema</i> <i>amabile</i>	6	-	-	-	1	-	9	-	3	-	-
57	<i>Hydrobiosella</i> <i>mixta</i>	9	-	-	-	-	-	-	-	-	-	-

58	<i>Hydrobiosis copis</i>	5	3	1	-	-	1	1	1	-	-	-
59	<i>Hydrobiosis soror</i>	5	-	-	-	-	-	-	-	-	-	-
60	<i>Hydrobiosis parumbripennis</i>	5	-	-	-	-	-	-	-	-	-	-
61	<i>Hydrobiosis</i> spp.	5	-	-	-	1	1	1	3	1	-	-
62	<i>Hydrobiosis umbripennis</i>	5	-	-	-	-	-	-	-	-	-	-
63	<i>Hydrochorema crassicaudatum</i>	9	-	-	-	-	-	-	-	-	-	-
64	<i>Neurochorema armstrongi</i>	6	-	-	-	-	-	-	-	-	-	-
65	<i>Neurochorema confusum</i>	6	5	-	-	-	1	-	-	-	-	-
66	<i>Neurochorema</i> spp.	6	-	-	-	-	-	-	-	-	-	-
67	<i>Oecetis unicolour</i>	6	-	-	-	-	-	-	-	-	-	-
68	<i>Olinga</i> spp.	9	-	-	-	-	-	6	-	-	-	-
69	<i>Oxyethira albiceps</i>	2	2	109	-	1	16	1	1	22	-	-
70	<i>Paroxyethira hendersoni</i>	2	-	-	-	-	-	-	-	5	-	-
71	<i>Plectrocnemia maclachlani</i>	8	-	-	-	-	-	-	-	-	-	-
72	<i>Plectrocnemia</i> sp.	8	-	-	-	-	-	-	-	-	-	-
73	<i>Psilochorema donaldsoni</i>	8	-	-	-	-	-	-	-	-	-	-
74	<i>Psilochorema</i>	8	-	-	-	-	-	-	-	-	-	-

	<i>leptoharpax</i>											
75	<i>Psilochorema macroharpax</i>	8	-	-	-	-	-	-	-	-	-	-
76	<i>Psilochorema</i> spp.	8	-	-	-	-	-	-	-	-	-	-
77	<i>Pycnocentria evecta</i>	7	-	-	-	2	2	30	1	-	-	-
78	<i>Pycnocentria</i> spp.	7	-	-	-	-	-	11	-	-	-	-
79	<i>Pycnocentrodes</i> sp.	5	4	-	-	37	-	55	1	5	-	1
80	<i>Triplectides obsoleta</i>	5	-	-	-	-	-	-	-	-	-	-
81	Moths											
	<i>Hygraula nitens</i>	4	-	-	-	-	-	-	-	2	-	-
82	Crustacea											
	Copepoda (Cyclopoidea)	5	-	-	-	-	-	-	-	-	-	-
83	<i>Daphnia</i> sp.	5	-	-	2	-	-	-	-	-	-	-
84	Ostracoda	3	-	-	-	-	-	-	13	7	-	-
85	<i>Paracalliope</i> sp.	5	-	-	16	-	-	-	8	2	-	1
86	<i>Paratya</i> sp.	5	-	-	-	-	-	-	-	-	-	-
87	<i>Phreatogammarus</i> sp.	5	-	-	-	-	-	-	-	-	-	-
88	Talitridae	5	-	-	-	-	-	-	-	-	-	-
89	Polychaeta											
	Nereidae		-	-	-	-	-	-	3	-	-	-

90	Spionidae		-	-	-	-	-	-	-	-	-	-
91	Oligochaeta	1	1	3	-	-	2	3	4	-	-	-
92	Platyhelminthes	3	-	-	13	-	-	-	35	1	-	-
93	Nematomorpha	3	-	2	-	-	-	-	2	-	-	-
94	Nemertea	3	1	-	3	-	-	-	25	4	-	-
95	Leeches											
	<i>Alboglossiphonia</i> sp.	3	-	-	-	-	-	-	-	1	-	-
96	<i>Barbronia weberi</i>	3	-	-	-	-	-	-	-	5	-	-
97	<i>Placobdelloides</i> sp.	3	-	-	17	-	-	-	-	-	-	-
98	Snails											
	<i>Gyraulus</i> sp.	3	-	-	-	-	-	-	2	6	-	-
99	<i>Latia neritoides</i>	3	-	-	-	-	-	-	-	-	-	-
100	Lymnaeidae	3	-	-	-	-	-	-	-	-	-	-
101	<i>Physa acuta</i>	3	-	-	-	-	-	-	-	-	-	-
102	<i>Physa</i> sp.	3	-	-	3	-	-	-	26	4	-	-
103	<i>Potamopyrgus</i> <i>antipodarum</i>	4	27	30	73	1	25	141	134	572	2210	6
104	Mites											
	Oribatidae	5	-	-	-	-	-	-	-	-	1	-
105	<i>Piona</i> sp.	5	-	-	115	-	-	-	-	-	-	-
106	<i>Zelandobates</i> <i>tornus</i>	5	5	2	-	-	1	1	3	2	-	-

107												
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Appendix 8.5.4.3 B: Horizons (Manawatu - Wanganui) Regional Council macro invertebrate data - 2009 sampling round (11-20 of 40 samples).

			HRC2009 SOE13	HRC2009 SOE14	HRC2009 SOE15	HRC2009 SOE16	HRC2009 SOE17	HRC2009 SOE18	HRC2009 SOE19	HRC2009 SOE21	HRC2009 SOE22	HRC2009 SOE24
	Horizons SOE 2009		Manawatu River	Manawatu River	Mangahao River	Manganui o te Ao	Mangapapa Stream	Mangatai noka River	Mangatai noka River	Manga whero River	Manga whero River	Oroua River
	Subsampled		Teachers College	Upper Gorge	Ballance	Ashworth Bridge	Troup Rd Bridge	Putara	SH2	DoC Headquarters	Pakihi Rd Bridge	Almadale
	(% counted in cell comment)	Easting	2733100	2749400	2746700	2700300	2751900	2725300	2752800	2717900	2710000	2736500
	Animals in 2 vials	Northing	6089200	6093300	6081800	6208200	6092100	6055300	6083100	6197700	6194500	6111300
	Mayflies											
1	<i>Austroclima sepia</i>	9	1	-	-	-	1		-	-	5	2
2	<i>Austroclima sp.</i>	9	-	-	-	-	-		-	1	-	-
3	<i>Coloburiscus humeralis</i>	9	1	-	-	3	-	2	-	2	2	-
4	<i>Deleatidium sp.</i>	8	19	23	94	4	5	71	11	5	16	35
5	<i>Nesameletus ornatus</i>	9	-	-	1	5	-	10	-	-	3	-
6	<i>Nesameletus sp.</i>	9	-	-	-	-	-		-	1	-	-
7	<i>Zephlebia dentata</i>	7	-	-	-	-	-	-	-	-	-	-

8	<i>Zephlebia inconspicua</i>	7	-	-	-	-	-	-	-	-	-	-
9	<i>Zephlebia</i> sp.	7	-	-	-	-	-	-	-	-	-	-
	Stoneflies											
10	<i>Acroperla trivacuata</i>	5	-	-	-	-	-	-	-	-	-	-
11	<i>Austroperla cyrene</i>	9	-	-	-	-	-	4	-	20	1	-
12	<i>Megaleptoperla diminuta</i>	9	-	-	-	1	-	-	-	-	-	-
13	<i>Megaleptoperla grandis</i>	9	-	-	-	-	-	-	-	1	-	-
14	<i>Stenoperla hendersoni</i>	10	-	-	-	-	-	-	-	-	-	-
15	<i>Stenoperla prasina</i>	10	-	-	-	-	-	-	-	-	-	-
16	<i>Zelandobius furcillatus</i> group	5	-	-	-	-	-	-	-	-	-	-
17	<i>Zelandobius</i> sp.	5	-	-	-	-	-	-	-	-	2	-
18	<i>Zelandoperla decorata</i>	10	-	-	-	1	-	68	-	10	-	-
19	<i>Zelandoperla</i> spp.	10	-	-	1	3	-	32	-	-	-	-
	Odonata											
20	tail-less damselflies		-	-	-	-	-	-	-	-	-	-
	Water Bugs											
21	<i>Microvelia macgregori</i>	5	-	-	-	-	-	-	-	-	-	-
22	<i>Saldula</i> sp.	5	-	-	-	-	-	-	1	-	-	-
23	<i>Sigara</i> sp.	5	-	-	1	-	-	-	-	-	-	-
	Dobsonflies											

24	<i>Archichauliodes diversus</i>	7	-	1	-	4	4	-	5	26	30	5
	Beetles											
25	<i>Berosus</i> sp.	5	-	-	1	-	-	-	2	-	-	-
26	Elmidae	6	16	6	18	15	17	23	50	69	372	96
27	<i>Enochrus</i> sp.	5	-	-	-	-	-	-	-	-	-	-
28	Hydraenidae	8	-	-	-	-	-	1	-	1	2	-
29	Ptilodactylidae	8	-	-	-	-	-	-	-	-	-	-
	True Flies											
30	Anthomyiidae	3	-	-	-	-	-	-	-	-	-	-
31	<i>Aphrophila neozelandica</i>	5	-	2	2	1	-	2	-	-	22	-
32	<i>Austrosimulium</i> spp.	3	-	1	-	-	1	-	2	1	2	-
33	Ceratopogonidae	3	-	-	-	-	-	-	-	-	-	-
34	<i>Chironomus</i> sp. A	1	-	-	-	-	-	-	-	-	-	-
35	<i>Chironomus zelandicus</i>	1	-	-	-	-	-	-	-	-	-	-
36	Empididae	3	-	-	-	-	-	-	-	3	2	-
37	Ephydriidae	4	-	-	-	-	-	-	-	-	-	-
38	Eriopterini	9	1	-	3	-	-	1	-	1	5	1
39	<i>Harrisius pallidus</i>	6	-	-	-	-	-	-	-	-	-	-
40	<i>Lobodiamesa</i> sp.	5	-	-	-	-	-	-	-	-	-	-
41	<i>Maoridiamesa</i> spp.	3	-	-	-	9	-	-	-	-	1	-
42	<i>Molophilus</i> sp.	5	-	-	-	-	-	-	-	-	-	1
43	Orthoclaadiinae	2	2	1	27	-	-	-	2	1	9	1

44	<i>Paradixa</i> sp.	4	-	-	-	-	-	-	-	-	-	-
45	<i>Paralimnophila skusei</i>	6	-	-	-	-	-	-	-	-	-	-
46	<i>Polypedilum</i> spp.	3	-	-	-	-	-	-	-	-	-	-
47	<i>Stictocladus</i> sp.	2	-	-	-	-	-	-	-	-	-	-
48	Tabanidae	3	-	-	-	-	-	-	-	-	-	-
49	Tanyderidae	4	-	-	-	-	-	-	-	1	-	-
50	Tanypodinae	5	-	-	-	-	-	-	-	-	-	-
51	<i>Tanytarsus</i> spp.	3	-	1	65	29	1	-	3	-	-	9
	Caddisflies											
52	<i>Aoteapsyche</i> spp.	4	7	10	39	6	1	2	9	-	51	5
53	<i>Beraeoptera roria</i>	4	-	-	-	2	-	1	-	5	-	-
54	<i>Costachorema xanthopterum</i>	7	-	-	-	-	-	-	-	-	2	-
55	<i>Costachorema</i> spp.	7	-	-	-	1	-	-	-	1	1	-
56	<i>Helicopsyche</i> sp.	10	-	-	-	-	-	1	-	2	-	-
57	<i>Hudsonema amabile</i>	6	-	-	1	-	1	-	-	-	-	-
58	<i>Hydrobiosella mixta</i>	9	-	-	-	-	-	-	-	-	-	-
59	<i>Hydrobiosis copis</i>	5	-	-	1	1	-	-	-	-	-	-
60	<i>Hydrobiosis soror</i>	5	-	-	-	-	-	2	-	-	-	-
61	<i>Hydrobiosis parumbripennis</i>	5	-	-	-	1	-	-	-	-	2	-
62	<i>Hydrobiosis</i> spp.	5	1	1	11	-	-	-	-	-	-	-
63	<i>Hydrobiosis umbripennis</i>	5	-	-	7	-	1	-	-	-	-	-

64	<i>Hydrochorema crassicaudatum</i>	9	-	-	-	-	-	-	-	-	-	-
65	<i>Neurochorema armstrongi</i>	6	-	-	-	1	-	-	-	-	1	-
66	<i>Neurochorema confusum</i>	6	-	-	-	3	-	-	-	-	-	-
67	<i>Neurochorema</i> spp.	6	-	-	-	1	-	-	-	-	-	-
68	<i>Oecetis unicolour</i>	6	-	-	-	-	-	-	-	-	-	-
69	<i>Olinga</i> spp.	9	-	-	2	1	2	3	1	7	7	-
70	<i>Oxyethira albiceps</i>	2	-	-	-	3	-	-	2	-	-	-
71	<i>Paroxyethira hendersoni</i>	2	-	-	-	-	-	-	-	-	-	-
72	<i>Plectrocnemia maclachlani</i>	8	-	-	-	-	-	-	-	-	-	-
73	<i>Plectrocnemia</i> sp.	8	-	-	-	-	-	-	-	-	-	-
74	<i>Psilochorema donaldsoni</i>	8	-	-	-	-	-	-	-	-	-	-
75	<i>Psilochorema leptoharpax</i>	8	-	-	4	-	-	-	-	-	-	2
76	<i>Psilochorema macroharpax</i>	8	-	-	-	-	-	1	-	-	-	-
77	<i>Psilochorema</i> spp.	8	-	-	3	-	-	-	-	2	-	-
78	<i>Pycnocentria evecta</i>	7	-	-	-	-	14	-	4	1	2	-
79	<i>Pycnocentria</i> spp.	7	-	-	-	1	50	-	-	-	14	-
80	<i>Pycnocentroides</i> sp.	5	-	-	65	-	90	-	12	5	152	4
81	<i>Triplectides obsoleta</i>	5	-	-	-	-	-	-	-	-	-	-
	Moths											

82	<i>Hydraula nitens</i>	4	-	-	-	-	-	-	-	-	-	-
	Crustacea											
83	Copepoda (Cyclopoidea)	5	-	1	-	-	-	-	-	-	-	-
84	<i>Daphnia</i> sp.	5	-	-	-	-	-	-	-	-	-	-
85	Ostracoda	3	-	-	-	-	-	-	-	-	-	-
86	<i>Paracalliope</i> sp.	5	-	2	-	-	-	-	-	-	-	-
87	<i>Paratya</i> sp.	5	-	-	-	-	-	-	-	-	-	-
88	<i>Phreatogammarus</i> sp.	5	-	-	-	-	-	-	-	-	-	-
89	Talitridae	5	-	-	-	-	-	-	-	-	-	-
	Polychaeta											
90	Nereidae		-	-	-	-	-	-	-	-	-	-
91	Spionidae		-	-	-	-	-	-	-	-	-	-
92	Oligochaeta	1	1	-	-	-	-	-	-	-	-	-
93	Platyhelminthes	3	-	-	-	-	-	-	-	-	-	-
94	Nematomorpha	3	-	-	-	-	-	-	-	-	-	-
95	Nemertea	3	1	-	-	-	-	-	1	-	-	-
	Leeches											
96	<i>Alboglossiphonia</i> sp.	3	-	-	-	-	-	-	-	-	-	-
97	<i>Barbronia weberi</i>	3	-	-	-	-	-	-	-	-	-	-
98	<i>Placobdelloides</i> sp.	3	-	-	-	-	-	-	-	-	-	-
	Snails											
99	<i>Gyraulus</i> sp.	3	-	-	-	-	-	-	-	-	-	-

100	<i>Latia neritoides</i>	3	-	-	-	-	-	-	-	-	-	-
101	Lymnaeiidae	3	-	-	-	-	-	-	-	-	-	-
102	<i>Physa acuta</i>	3	-	-	-	-	-	-	-	-	-	-
103	<i>Physa</i> sp.	3	-	-	-	-	-	-	-	-	-	-
104	<i>Potamopyrgus antipodarum</i>	4	19	4	2	32	125	-	14	2	22	1
	Mites											
105	Oribatidae	5	-	-	-	-	-	-	-	-	-	-
106	<i>Piona</i> sp.	5	-	-	-	-	-	-	-	-	-	-
107	<i>Zelandobates tornus</i>	5	1	-	-	3	-	-	10	-	2	-

Appendix 8.5.4.3 C: Horizons (Manawatu - Wanganui) Regional Council macro invertebrate data -2009 sampling round (21-30 of 40 samples).

Site name			HRC2009 SOE25	HRC2009 SOE26	HRC2009 SOE27	HRC2009 SOE28	HRC2009 SOE31	HRC2009 SOE32	HRC2009 SOE33	HRC2009 SOE34	HRC2009 SOE35	HRC2009 SOE36
	Horizons SOE 2009		Oroua River	Oroua River	Orouakere taki	Owahanga River	Pohangina River	Porewa Stream	Rangitikei River	Rangitikei River	Rangitikei River	Rangitikei River
	Subsampled		Awahuri Bridge	Apiti Gorge Bridge	SH2	Branscombe Bridge	Piripiri	Onepuhi Rd	Mangaweka	Onepuhi	Pukeokahu	McKelvies
	(% counted in cell comment)	Easting	2724400	2760000	2767900	2789400	2760500	2719200	2750300	2719200	2771300	2703430
	Animals in 2 vials	North ing	6100300	6136700	6101400	6058700	6124100	6122500	6151300	6122500	6170800	6098660
	Mayflies											
1	<i>Austroclima sepia</i>	9	2	-	1	1	-	-	6	-	1	-
2	<i>Austroclima</i> sp.	9	-	-	-	-	-	-	-	-	-	-
3	<i>Coloburiscus humeralis</i>	9	-	-	9	-	1	-	-	-	10	-
4	<i>Deleatidium</i> sp.	8	8	108	9	-	224	4	10	31	13	-
5	<i>Nesameletus ornatus</i>	9	-	15	-	-	6	-	-	-	4	-
6	<i>Nesameletus</i> sp.	9	-	-	-	-	-	-	-	-	-	-
7	<i>Zephlebia dentata</i>	7	-	-	-	-	-	-	-	-	-	-
8	<i>Zephlebia inconspicua</i>	7	-	-	-	-	-	-	-	-	-	-
9	<i>Zephlebia</i> sp.	7	-	-	1	-	-	-	-	-	-	-
	Stoneflies											

10	<i>Acroperla trivacuata</i>	5	-	-	-	-	-	-	-	-	-	-
11	<i>Austroperla cyrene</i>	9	-	1	-	-	-	-	-	-	-	-
12	<i>Megaleptoperla diminuta</i>	9	-	1	-	-	1	-	-	-	-	-
13	<i>Megaleptoperla grandis</i>	9	-	-	-	-	-	-	-	-	-	-
14	<i>Stenoperla hendersoni</i>	10	-	-	-	-	-	-	-	-	-	-
15	<i>Stenoperla prasina</i>	10	-	-	-	-	-	-	-	-	-	-
16	<i>Zelandobius furcillatus</i> group	5	-	-	-	-	-	-	-	-	-	-
17	<i>Zelandobius</i> sp.	5	-	-	-	-	-	-	-	-	-	-
18	<i>Zelandoperla decorata</i>	10	-	15	-	-	23	-	-	-	1	-
19	<i>Zelandoperla</i> spp.	10	-	-	-	-	74	-	-	1	4	-
	Odonata											
20	tail-less damselflies		-	-	-	-	-	-	-	-	-	-
	Water Bugs											
21	<i>Microvelia macgregori</i>	5	-	-	-	-	-	-	-	-	-	-
22	<i>Saldula</i> sp.	5	-	-	-	-	-	-	-	-	-	-
23	<i>Sigara</i> sp.	5	-	-	-	-	-	5	1	-	-	-
	Dobsonflies											
24	<i>Archichauliodes diversus</i>	7	-	1	39	2	-	14	-	-	6	4
	Beetles											

25	<i>Berosus</i> sp.	5	3	-	1	4	-	-	-	-	-	-
26	Elmidae	6	64	212	179	45	133	105	32	28	77	28
27	<i>Enochrus</i> sp.	5	-	-	-	-	-	-	-	-	-	-
28	Hydraenidae	8	-	-	3	-	-	-	-	-	1	-
29	Ptilodactylidae	8	-	-	-	-	-	-	-	-	-	-
	True Flies											
30	Anthomyiidae	3	-	-	-	-	-	-	1	-	17	-
31	<i>Aphrophila neozelandica</i>	5	-	-	9	-	2	1	-	-	-	-
32	<i>Austrosimulium</i> spp.	3	-	1	5	-	13	-	-	-	2	-
33	Ceratopogonidae	3	-	-	-	-	-	-	-	-	-	-
34	<i>Chironomus</i> sp. A	1	-	-	-	3	-	-	16	-	-	-
35	<i>Chironomus zelandicus</i>	1	-	-	-	-	-	-	-	-	-	-
36	Empididae	3	-	-	-	2	-	4	1	-	-	4
37	Ephydriidae	4	-	-	-	-	-	-	-	-	-	-
38	Eriopterini	9	-	4	1	-	7	-	-	5	5	-
39	<i>Harrisius pallidus</i>	6	-	-	-	-	-	-	-	-	-	-
40	<i>Lobodiamesa</i> sp.	5	-	-	-	-	-	-	-	-	-	-
41	<i>Maoridiamesa</i> spp.	3	-	-	-	-	-	-	1	-	4	-
42	<i>Molophilus</i> sp.	5	-	-	-	-	-	-	-	1	-	-
43	Orthoclaadiinae	2	17	3	-	-	4	10	6	3	3	18
44	<i>Paradixa</i> sp.	4	-	-	-	-	-	-	-	-	-	-

45	<i>Paralimnophila skusei</i>	6	-	-	-	-	-	-	-	-	-	-
46	<i>Polypedilum</i> spp.	3	-	-	-	-	1	-	1	-	-	-
47	<i>Stictocladus</i> sp.	2	-	-	-	-	-	-	-	-	-	-
48	Tabanidae	3	-	-	-	-	-	-	-	-	-	-
49	Tanyderidae	4	-	-	-	-	-	-	-	-	-	-
50	Tanypodinae	5	1	-	-	4	-	4	42	5	-	4
51	<i>Tanytarsus</i> spp.	3	22	2	13	18	3	26	592	100	24	51
	Caddisflies											
52	<i>Aoteapsyche</i> spp.	4	6	9	22	29	3	26	3	3	48	32
53	<i>Beraeoptera roria</i>	4	-	10	-	-	1	-	-	-	-	-
54	<i>Costachorema xanthopterum</i>	7	-	-	-	-	1	-	-	-	1	-
55	<i>Costachorema</i> spp.	7	-	1	-	-	-	-	-	-	1	-
56	<i>Helicopsyche</i> sp.	10	-	-	-	-	-	-	-	-	1	-
57	<i>Hudsonema amabile</i>	6	-	-	2	43	-	35	-	-	-	-
58	<i>Hydrobiosella mixta</i>	9	-	-	-	-	-	-	-	-	-	-
59	<i>Hydrobiosis copis</i>	5	-	-	-	-	-	6	-	-	1	-
60	<i>Hydrobiosis soror</i>	5	-	-	1	-	-	-	-	-	-	-
61	<i>Hydrobiosis parumbripennis</i>	5	-	-	-	-	-	-	-	-	1	-
62	<i>Hydrobiosis</i> spp.	5	-	-	-	1	1	4	2	1	-	1
63	<i>Hydrobiosis umbripennis</i>	5	-	-	-	-	-	7	2	1	-	-

64	<i>Hydrochorema crassicaudatum</i>	9	-	1	-	-	-	-	-	-	-	-
65	<i>Neurochorema armstrongi</i>	6	-	-	-	-	-	-	-	-	-	-
66	<i>Neurochorema confusum</i>	6	-	-	-	-	-	-	-	-	-	-
67	<i>Neurochorema</i> spp.	6	-	-	-	-	-	-	-	-	-	-
68	<i>Oecetis unicolour</i>	6	-	-	-	2	-	-	-	-	-	-
69	<i>Olinga</i> spp.	9	-	2	28	-	1	-	1	-	10	-
70	<i>Oxyethira albiceps</i>	2	-	-	-	-	-	4	12	-	-	-
71	<i>Paroxyethira hendersoni</i>	2	-	-	-	-	-	-	-	-	-	-
72	<i>Plectrocnemia maclachlani</i>	8	-	-	-	-	-	-	-	-	1	-
73	<i>Plectrocnemia</i> sp.	8	-	-	-	-	-	-	-	-	-	-
74	<i>Psilochorema donaldsoni</i>	8	-	-	-	-	-	1	-	-	1	-
75	<i>Psilochorema leptoharpax</i>	8	-	2	-	-	3	-	1	2	4	-
76	<i>Psilochorema macroharpax</i>	8	-	-	-	-	-	-	-	-	-	-
77	<i>Psilochorema</i> spp.	8	-	1	-	1	1	-	-	1	1	-
78	<i>Pycnocentria evecta</i>	7	-	-	54	-	-	-	-	-	-	-
79	<i>Pycnocentria</i> spp.	7	-	1	68	-	-	-	-	-	-	-
80	<i>Pycnocentroides</i> sp.	5	-	3	132	8	-	2	10	3	10	-
81	<i>Triplectides</i>	5	-	-	-	-	-	-	-	-	-	-

	<i>obsoleta</i>											
	Moths											
82	<i>Hygraula nitens</i>	4	-	-	-	-	-	-	-	-	-	-
	Crustacea											
83	Copepoda (Cyclopoidea)	5	-	-	-	-	-	-	-	-	-	-
84	<i>Daphnia</i> sp.	5	-	-	-	-	-	-	-	-	-	-
85	Ostracoda	3	-	-	-	-	-	5	2	1	-	-
86	<i>Paracalliope</i> sp.	5	-	-	-	-	-	-	-	-	-	1
87	<i>Paratya</i> sp.	5	-	-	-	-	-	-	-	-	-	4
88	<i>Phreatogammarus</i> sp.	5	-	-	-	-	-	-	-	-	-	-
89	Talitridae	5	-	-	-	-	-	-	-	-	-	-
	Polychaeta											
90	Nereidae		-	-	-	-	-	-	-	-	-	-
91	Spionidae		-	-	-	-	-	-	-	-	-	-
92	Oligochaeta	1	-	-	-	2	-	-	1	-	-	-
93	Platyhelminthes	3	-	-	-	-	-	-	-	-	-	-
94	Nematomorpha	3	2	-	-	-	-	2	-	-	-	1
95	Nemertea	3	-	-	-	-	-	-	1	-	-	-
	Leeches											
96	<i>Alboglossiphonia</i> sp.	3	-	-	-	1	-	-	-	-	-	-
97	<i>Barbronia weberi</i>	3	-	-	-	-	-	-	-	-	-	-
98	<i>Placobdelloides</i>	3	-	-	-	-	-	-	-	-	-	-

	sp.											
	Snails											
99	<i>Gyraulus</i> sp.	3	-	-	-	-	-	-	-	-	-	-
100	<i>Latia neritoides</i>	3	-	-	-	-	-	-	-	-	-	-
101	Lymnaeiidae	3	-	-	-	-	-	-	-	-	-	-
102	<i>Physa acuta</i>	3	-	-	-	-	-	-	-	-	-	-
103	<i>Physa</i> sp.	3	-	-	-	-	-	-	-	-	-	-
104	<i>Potamopyrgus antipodarum</i>	4	3	-	59	916	1	55	13	4	3	82
	Mites											
105	Oribatidae	5	-	-	-	-	-	-	-	-	-	-
106	<i>Piona</i> sp.	5	-	-	-	-	-	-	-	-	-	-
107	<i>Zelandobates tornus</i>	5	-	-	-	2	-	-	3	-	-	6

Appendix 8.5.4.3 D: Horizons (Manawatu - Wanganui) Regional Council macro invertebrate data -2009 sampling round (31-40 of 40 samples).

			HRC2009 SOE37	HRC2009 SOE38	HRC2009 SOE39	HRC2009 SOE40	HRC2009 SOE41	HRC2009 SOE42	HRC2009 SOE44	HRC2009 SOE45	HRC2009 SOE46	HRC2009 SOE47
	Horizons SOE 2009		Tamaki River	Tamaki River	Tiraumea River	Tiraumea River	Tokiahuru Stream	Tokomaru River	Whanganui River	Whanganui River	Whanganui River	Whanganui River
	Subsampled		Reserve	Stephensons	Ngaturi	Hauptokua Reserve	u/s Whangaehu	Horseshoe bend	Cherry Grove	d/s Retaruke confl	Pipiriki	Te Maire
	(% counted in cell comment)	Easting	2768300	2770700	2757800	2755900	2721378	2724100	2705700	2688300	2685800	2699800
	Animals in 2 vials	Northing	6116200	6102200	6078000	6085400	6186951	6076800	6254500	6230500	6189600	6249000
	Mayflies											
1	<i>Austroclima sepia</i>	9	-	-	1	-	1	-	-	-	9	4
2	<i>Austroclima</i> sp.	9	-	-	-	-	-	-	-	-	-	-
3	<i>Coloburiscus humeralis</i>	9	-	-	2	-	3	-	66	1	6	36
4	<i>Deleatidium</i> sp.	8	22	10	4	35	1	29	100	-	1	1
5	<i>Nesameletus ornatus</i>	9	1	-	-	-	-	2	1	-	-	-
6	<i>Nesameletus</i> sp.	9	-	-	-	-	-	-	-	-	-	-
7	<i>Zephlebia dentata</i>	7	-	-	-	-	-	-	-	-	-	3
8	<i>Zephlebia inconspicua</i>	7	-	-	-	-	-	-	-	-	-	1
9	<i>Zephlebia</i> sp.	7	-	-	1	-	-	-	-	-	-	-
	Stoneflies											
10	<i>Acroperla</i>	5	-	-	-	-	-	-	-	2	1	-

	<i>trivacuata</i>											
11	<i>Austroperla cyrene</i>	9	18	-	-	-	-	1	1	-	-	-
12	<i>Megaleptoperla diminuta</i>	9	-	-	-	-	2	-	-	-	-	-
13	<i>Megaleptoperla grandis</i>	9	-	-	-	-	-	-	-	-	-	-
14	<i>Stenoperla hendersoni</i>	10	-	-	-	-	-	-	-	-	-	-
15	<i>Stenoperla prasina</i>	10	1	-	-	-	-	-	-	-	-	-
16	<i>Zelandobius furcillatus</i> group	5	-	-	-	-	-	-	-	1	3	-
17	<i>Zelandobius</i> sp.	5	-	-	-	-	-	-	1	-	-	-
18	<i>Zelandoperla decorata</i>	10	7	-	-	-	1	34	-	-	-	-
19	<i>Zelandoperla</i> spp.	10	3	-	-	-	1	12	-	-	-	-
	Odonata											
20	tail-less damselflies		-	-	-	-	-	-	-	-	-	-
	Water Bugs											
21	<i>Microvelia macgregori</i>	5	-	-	-	-	-	-	-	-	-	-
22	<i>Saldula</i> sp.	5	-	-	-	-	-	-	-	-	-	-
23	<i>Sigara</i> sp.	5	-	-	-	-	-	-	-	-	-	-
	Dobsonflies											
24	<i>Archichauliodes diversus</i>	7	1	7	17	2	-	-	5	3	5	9
	Beetles											

25	<i>Berosus</i> sp.	5	-	-	2	1	-	-	-	-	-	-
26	Elmidae	6	24	45	50	171	5	28	248	66	59	14
27	<i>Enochrus</i> sp.	5	-	-	-	-	-	-	-	-	-	-
28	Hydraenidae	8	-	-	-	-	-	6	-	-	-	1
29	Ptilodactylidae	8	-	-	-	-	-	-	-	-	-	-
	True Flies											
30	Anthomyiidae	3	-	-	3	-	-	-	-	-	-	-
31	<i>Aphrophila neozelandica</i>	5	-	-	21	2	-	3	8	1	2	2
32	<i>Austrosimulium</i> spp.	3	-	1	-	1	-	-	1	-	-	-
33	Ceratopogonidae	3	-	-	-	-	-	-	-	-	-	-
34	<i>Chironomus</i> sp. A	1	-	-	-	-	-	-	-	-	-	-
35	<i>Chironomus zelandicus</i>	1	-	-	-	-	-	-	-	-	-	-
36	Empididae	3	-	-	7	-	-	-	-	2	1	-
37	Ephydriidae	4	-	-	-	-	-	-	-	-	-	-
38	Eriopterini	9	2	3	11	-	8	4	2	-	-	-
39	<i>Harrisius pallidus</i>	6	-	-	-	-	-	-	-	-	-	-
40	<i>Lobodiamesa</i> sp.	5	-	-	-	-	-	-	1	-	-	-
41	<i>Maoridiamesa</i> spp.	3	-	-	1	-	-	-	3	-	-	2
42	<i>Molophilus</i> sp.	5	-	-	-	-	-	-	-	-	-	-
43	Orthoclaadiinae	2	2	1	3	4	6	6	20	-	3	4
44	<i>Paradixa</i> sp.	4	-	-	-	-	-	-	-	-	-	-
45	<i>Paralimnophila</i>	6	-	-	-	-	-	-	-	-	-	-

	<i>skusei</i>											
46	<i>Polypedilum</i> spp.	3	-	-	4	-	-	-	2	-	-	-
47	<i>Stictocladus</i> sp.	2	-	-	-	-	-	-	-	-	-	-
48	Tabanidae	3	-	-	-	-	-	-	-	-	-	-
49	Tanyderidae	4	-	-	-	-	1	-	-	-	-	-
50	Tanypodinae	5	-	1	-	-	-	-	-	-	-	-
51	<i>Tanytarsus</i> spp.	3	-	5	94	2	-	4	20	11	3	1
	Caddisflies											
52	<i>Aoteapsyche</i> spp.	4	-	2	32	40	1	6	49	11	196	53
53	<i>Beraeoptera roria</i>	4	-	-	-	-	-	1	-	-	-	-
54	<i>Costachorema xanthopterum</i>	7	-	-	-	-	-	2	-	-	-	-
55	<i>Costachorema</i> spp.	7	-	-	1	-	-	-	-	-	-	-
56	<i>Helicopsyche</i> sp.	10	-	1	-	-	-	-	-	-	-	-
57	<i>Hudsonema amabile</i>	6	-	2	42	-	-	-	-	-	-	-
58	<i>Hydrobiosella mixta</i>	9	-	-	-	-	-	2	-	-	-	-
59	<i>Hydrobiosis copis</i>	5	-	-	6	-	-	-	4	-	3	4
60	<i>Hydrobiosis soror</i>	5	-	1	-	-	-	-	-	-	-	-
61	<i>Hydrobiosis parumbripennis</i>	5	-	-	-	-	-	-	-	-	1	-
62	<i>Hydrobiosis</i> spp.	5	-	3	6	6	-	1	5	3	-	-
63	<i>Hydrobiosis umbripennis</i>	5	-	-	2	-	-	-	-	-	-	-

64	<i>Hydrochorema crassicaudatum</i>	9	-	-	-	-	-	-	-	-	-	-
65	<i>Neurochorema armstrongi</i>	6	-	-	-	-	-	-	-	-	-	-
66	<i>Neurochorema confusum</i>	6	-	-	-	-	-	-	2	-	-	2
67	<i>Neurochorema</i> spp.	6	-	-	-	-	-	-	-	1	-	-
68	<i>Oecetis unicolour</i>	6	-	-	-	-	-	-	-	-	-	-
69	<i>Olinga</i> spp.	9	1	17	-	-	-	-	24	13	3	5
70	<i>Oxyethira albiceps</i>	2	-	-	1	-	-	-	-	24	9	2
71	<i>Paroxyethira hendersoni</i>	2	-	-	1	-	-	-	-	-	-	-
72	<i>Plectrocnemia maclachlani</i>	8	-	-	-	-	-	-	-	-	-	-
73	<i>Plectrocnemia</i> sp.	8	-	-	-	-	-	-	-	-	-	-
74	<i>Psilochorema donaldsoni</i>	8	-	-	1	-	-	-	-	-	-	-
75	<i>Psilochorema leptoharpax</i>	8	-	5	-	-	-	-	1	-	-	-
76	<i>Psilochorema macroharpax</i>	8	-	-	-	-	-	-	-	-	-	-
77	<i>Psilochorema</i> spp.	8	6	-	-	-	-	-	-	-	-	-
78	<i>Pycnocentria evecta</i>	7	-	23	51	1	3	-	-	2	5	-
79	<i>Pycnocentria</i> spp.	7	1	14	15	-	-	-	-	-	18	-
80	<i>Pycnocentroides</i> sp.	5	-	82	58	43	-	-	10	-	31	4
81	<i>Triplectides</i>	5	-	-	1	-	-	-	-	-	-	-

	<i>obsoleta</i>											
	Moths											
82	<i>Hygraula nitens</i>	4	-	-	-	-	-	-	-	-	-	-
	Crustacea											
83	Copepoda (Cyclopoidea)	5	-	-	-	-	-	-	-	-	-	-
84	<i>Daphnia</i> sp.	5	-	-	-	-	-	-	-	-	-	-
85	Ostracoda	3	-	-	-	-	-	-	-	-	-	-
86	<i>Paracalliope</i> sp.	5	-	-	7	-	-	-	2	-	-	-
87	<i>Paratya</i> sp.	5	-	-	-	-	-	-	-	-	-	-
88	<i>Phreatogammarus</i> sp.	5	-	-	-	-	-	-	-	-	-	-
89	Talitridae	5	1	-	-	-	-	-	-	-	-	-
	Polychaeta											
90	Nereidae		-	-	-	-	-	-	-	-	-	-
91	Spionidae		-	-	-	1	-	-	-	-	-	-
92	Oligochaeta	1	-	-	2	-	-	-	1	-	-	-
93	Platyhelminthes	3	-	-	-	-	-	-	-	-	-	-
94	Nematomorpha	3	-	-	-	-	-	-	2	-	-	-
95	Nemertea	3	-	-	-	-	-	-	-	-	-	-
	Leeches											
96	<i>Alboglossiphonia</i> sp.	3	-	-	-	-	-	-	-	-	1	-
97	<i>Barbronia weberi</i>	3	-	-	-	-	-	-	-	-	-	-
98	<i>Placobdelloides</i>	3	-	-	-	-	-	-	-	-	-	-

	sp.											
	Snails											
99	<i>Gyraulus</i> sp.	3	-	-	-	-	-	-	-	-	-	-
100	<i>Latia neritoides</i>	3	-	-	1	-	-	-	-	-	18	1
101	Lymnaeiidae	3	-	-	-	-	-	-	-	-	-	-
102	<i>Physa acuta</i>	3	-	-	-	-	-	-	-	-	-	-
103	<i>Physa</i> sp.	3	-	-	-	-	-	-	-	-	-	1
104	<i>Potamopyrgus antipodarum</i>	4	-	6	368	31	-	-	67	41	216	89
	Mites											
105	Oribatidae	5	-	11	-	-	-	-	-	-	-	-
106	<i>Piona</i> sp.	5	-	-	-	-	-	-	-	-	-	-
107	<i>Zelandobates tornus</i>	5	-	1	2	42	-	-	1	19	3	6

8.5.4.4 Horizons (Manawatu - Wanganui) Regional Council: Water quality data

Table 8.5.4.4: Horizons Regional Council: Water quality data for stream sites as obtained from the RC council database

Site name	pH	Conductivity	Temperature (°C)
Hautapu River @ Alabasters	7.8	170	19.9
Hautapu River u/s Rangitikei River	8.1	180	20.3
Hokio Stream Lake outlet @ weir	7.9	280	24.6
Kahuterawa Stream @ Johnstons Rata	8.1	90	16.6
Makotuku River u/s Raetihi	7.5	110	17.8
Makuri River @ Tuscan Hills	8	340	15.1
Manawatu River @ Hopelands Reserve	7.68	225	18.5
Manawatu River @ Opiki Bridge	7.52	185	22.39
Manawatu River @ Teachers College	7.7	200	23.8
Manawatu River @ Upper Gorge	7.5	185	18.1
Manawatu River @ Weber Road	7.58	300	18.4
Manawatu River @ Whirokino	7.47	162	23.5
Mangahao River @ Ballance	7.72	113	19.91
Manganui o te Ao @ Ashworth Bridge	7.21	130	16.05
Mangapapa Stream @ Troup Rd Bridge	7.4	120	19.1
Mangatainoka River @ Putara	7.5	50	13.8
Mangatainoka River @ SH2	8.5	120	23.2
Mangawhero River @ DoC Headquarters	7.8	70	13.6
Mangawhero River @ Pakihi Rd Bridge	7.5	100	16.8
Oroua River @ Almadale	7.6	130	20
Oroua River @ Apiti Gorge Bridge	7.2	70	14.91
Oroua River @ Awahuri Bridge	7.95	186	21.71
Oruakeretaki @ SH2	6.37	102	16.47
Owahanga River @ Branscombe	7	390	20.1

Bridge			
Pohangina River @ Piripiri	7.5	70	15.3
Porewa Stream @ Onepuhi Rd	7.7	450	23.1
Rangitikei River @ Mangaweka	7.9	120	18.2
Rangitikei River @ McKelvies	7.9	170	20.7
Rangitikei River @ Onepuhi	7.6	150	22.5
Rangitikei River @ Pukeokahu	7.6	80	17.2
Tamaki River @ Reserve	7.8	60	12.6
Tamaki River @ Stephensons	7.4	80	20.8
Tiraumea River @ Haupokua Reserve	7.5	100	18.5
Tiraumea River @ Ngaturi	7.5	320	17.3
Tokiahuru Stream @ u/s Whangaehu	8.1	140	11.2
Tokomaru River @ Horseshoe bend	8.21	68	18.11
Whanganui River @ Cherry Grove	7.76	108	18.6
Whanganui River @ d/s Retaruke confl	7.87	120	20.88
Whanganui River @ Pipiriki	7.87	116	22.19
Whanganui River @ Te Maire	7.51	118	19.45

8.5.5 Greater Wellington Regional Council

8.5.5.1 Sample storage: Stream identifier codes

Table 8.5.5.1: Greater Wellington Regional Council: Sample labeling codes.

	STREAM	SHORT CODE LABEL	STREAM IDENTIFIER #
1	RS13 Horokiri stream	HOR1	WG10_HOR1
2		HOR2	WG10_HOR2
3		HOR3	WG10_HOR3
4		HOR4	WG10_HOR4
5		HOR5	WG10_HOR5
6	RS27 Waiwhetu stream	WAI1	WG10_WAI1
7		WAI2	WG10_WAI2
8		WAI3	WG10_WAI3
9		WAI4	WG10_WAI4
10		WAI5	WG10_WAI5
11	RS45 Parkvale tributary at Lowes reserve	PKT1	WG10_PKT1
12		PKT2	WG10_PKT2
13		PKT3	WG10_PKT3
14		PKT4	WG10_PKT4
15		PKT5	WG10_PKT5
16	RS48 Waiohine at Bicknells	WHB1	WG10_WHB1
17		WHB2	WG10_WHB2
18		WHB3	WG10_WHB3
19		WHB4	WG10_WHB4
20		WHB5	WG10_WHB5
21	RS37 Taueru at Gladstone	TR1	WG10_TR1
22		TR2	WG10_TR2
23		TR3	WG10_TR3

24		TR4	WG10_TR4
25		TR5	WG10_TR5
26	RS16 Porirua at Milk depot (Orewall park)	POR1	WG10_POR1
27		POR2	WG10_POR2
28		POR3	WG10_POR3
29		POR4	WG10_POR4
30		POR5	WG10_POR5
31	RS46 Parkvale stream at Weir	PKW1	WG10_PKW1
32		PKW2	WG10_PKW2
33		PKW3	WG10_PKW3
34		PKW4	WG10_PKW4
35		PKW5	WG10_PKW5
36	RS53 Awheea river	AW1	WG10_AW1
37		AW2	WG10_AW2
38		AW3	WG10_AW3
39		AW4	WG10_AW4
40		AW5	WG10_AW5
41	RS18 Karori	KAR1	WG10_KAR1
42		KAR2	WG10_KAR2
43		KAR3	WG10_KAR3
44		KAR4	WG10_KAR4
45		KAR5	WG10_KAR5
46	RS 19 Kaiwharawhara	KWH1	WG10_KWH1
47		KWH2	WG10_KWH2
48		KWH3	WG10_KWH3
49		KWH4	WG10_KWH4
50		KWH5	WG10_KWH5
51	RS22 Hutt at Boulcott	HUT1	WG10_HUT1
52		HUT2	WG10_HUT2
53		HUT3	WG10_HUT3
54		HUT4	WG10_HUT4

55		HUT5	WG10_HUT5
56	RS24 Mangaroa	MAN1	WG10_MAN1
57		MAN2	WG10_MAN2
58		MAN3	WG10_MAN3
59		MAN4	WG10_MAN4
60		MAN5	WG10_MAN5
61	RS36 Taueru at Castle Hill	TRC1	WG10_TRC1
62		TRC2	WG10_TRC2
63		TRC3	WG10_TRC3
64		TRC4	WG10_TRC4
65		TRC5	WG10_TRC5
66	RS02 Mangapouri at Bennetts road	MGP1	WG10_MGP1
67		MGP2	WG10_MGP2
68		MGP3	WG10_MGP3
69		MGP4	WG10_MGP4
70		MGP5	WG10_MGP5
71	Rs20 Hutt river at Te Marua	HTM1	WG10_HTM1
72		HTM2	WG10_HTM2
73		HTM3	WG10_HTM3
74		HTM4	WG10_HTM4
75		HTM5	WG10_HTM5
76	RS09 Waikanae at Mangaone at Walkway	WKN1	WG10_WKN1
77		WKN2	WG10_WKN2
78		WKN3	WG10_WKN3
79		WKN4	WG10_WKN4
80		WKN5	WG10_WKN5
81	RS 47 Waiohine river at Gorge	WG1	WG10_WG1
82		WG2	WG10_WG2
83		WG3	WG10_WG3
84		WG4	WG10_WG4
85		WG5	WG10_WG5

86	RS49 Beef Creek at headwaters	BC1	WG10_BC1
87		BC2	WG10_BC2
88		BC3	WG10_BC3
89		BC4	WG10_BC4
90		BC5	WG10_BC5
91	RS50 Mangatarere stream at SH2	MTR1	WG10_MTR1
92		MTR2	WG10_MTR2
93		MTR3	WG10_MTR3
94		MTR4	WG10_MTR4
95		MTR5	WG10_MTR5

Table 8.5.5.2: Greater Wellington Regional Council: Catchment land-use data for stream sites as obtained from the RC database.

Site Name	Site No	Indigenous forest	Exotic forest	Scrub	High producing pasture	Low producing pasture	Urban	Other	Cropping	Total catchment ha
Mangapouri Stream at Bennetts Rd	RS02	18.4	17.6	10.1	404.6	0.0	221.4	0.0	25.9	698.0
Waikanae River at Mangaone Walkway	RS09	893.6	121.3	0.0	22.5	0.0	0.0	0.0	0.0	1037.4
Horokiri Stream at Snodgrass	RS13	317.4	817.3	447.1	645.8	660.5	0.0	0.0	5.6	2893.5
Porirua Stream at Milk Depot (Wall Park)	RS16	392.4	313.2	356.0	1370.6	12.3	890.7	11.8	0.0	3346.9
Karori Stream at Makara Peak Mountain Bike	RS18	292.6	11.0	21.5	33.5	0.0	330.0	0.0	0.0	688.6
Kaiwharawhara Stream at Ngaio Gorge	RS19	580.1	100.6	201.9	168.5	0.0	577.3	3.7	0.0	1632.1
Hutt River at Te Marua Intake Site	RS20	16286.2	665.1	1189.5	1035.8	41.6	19.1	41.6	0.0	19278.7
Hutt River at Boulcott	RS22	39906.8	7239.4	2558.1	7429.1	584.6	2603.9	441.8	0.0	60769.7
Mangaroa River at Te Marua	RS24	5020.0	1602.1	293.1	3180.8	139.5	115.8	52.3	0.0	10409.6
Waiwhetu Stream at Wainui Hill Bridge	RS27	407.1	5.0	271.5	42.6	0.0	733.2	0.0	0.0	1459.5
Taueru River at Castlehill	RS36	340.4	283.3	320.5	854.4	0.0	0.0	0.0	0.0	1798.6
Taueru River at Gladstone	RS37	3322.5	7078.8	618.2	36964.5	1228.3	0.0	34.5	0.0	49246.7
Parkvale tributary at Lowes Reserve	RS45	0.0	2.7	0.0	12.0	2.9	0.0	0.0	0.0	17.6
Parkvale Stream at Weir	RS46	24.4	76.7	8.7	5106.2	14.2	1.6	6.2	1.0	5239.0
Waiohine River at Gorge	RS47	15232.7	210.0	2849.6	63.7	26.9	0.0	159.8	0.0	18549.1
Waiohine River at Bicknells	RS48	21448.0	1361.4	2980.6	10736.5	407.3	234.2	467.0	100.7	37742.1
Beef Creek at headwaters	RS49	285.2	0.4	1.8	0.0	0.0	0.0	0.0	0.0	287.5
Mangatarere River at State Highway 2	RS50	5050.9	789.1	36.9	5355.1	367.2	101.9	40.1	1.6	11742.7
Awhea River at Tora Rd	RS53	3854.4	1466.1	27.1	9075.6	472.4	0.0	132.5	0.0	15028.2

Appendix 8.5.5.3 A: Greater Wellington Regional Council macro invertebrate data 2009 sampling round (1-3 of 19 samples, 3 reps per sample).

		RS02			RS09			RS13			
		Site No									
		Site Name	Mangapouri @ Bennets Rd			Waikanae River @ Mangaone Walkway			Horokiri		
		Rep No	1	2	3	1	2	3	1	2	3
EOS ID	I090293	I090294	I090295	I090314	I090315	I090316	I090326	I090327	I090328		
Generic Grouping	MCI-level taxa										
Acarina	Acarina					1					
Coelenterata	Hydra										
Coleoptera	Antiporus										
	Berosus										
	Elmidae				22	32	25	35	21	21	
	Enochrus										
	Hydraenidae				7	8	11				
	Hydrophilidae										
	Ptilodactylidae									P	
	Rhantus										
Collembola	Collembola										
Crustacea	Amphipoda										
	Cladocera										

	Copepoda								
	Cyclograpsus								
	Helice								
	Isopoda								
	Mysidae								
	Ostracoda	2		P				1	
	Paracalliope	105	184	270				1	
	Paranephrops								
	Paratya	2	P						
Diptera	Aphrophila								
	Austrosimulium				1		1	14	1
	Ceratopogonidae								
	Chironominae								
	Chironomus								
	Corynoneura								
	Diamesinae								
	Dolichopodidae								
	Empididae								
	Ephydriidae								
	Eriopterini				P		P		
	Harrisius		P						
	Hexatomini								
	Limonia								
	Maoridiamesa							1	

	Mischoderus									
	Molophilus									
	Muscidae									
	Neolimnia									
	Nothodixa									
	Orthoclaadiinae					1		5	8	7
	Paradixa	P	P							
	Paralimnophila									
	Peritheates				1	P	P			
	Psychodidae									
	Scatella									
	Stratiomyidae									
	Tabanidae									
	Tanypodinae	1	P							
	Tanytarsini				1	1	1			
	Zelandotipula									
Ephemeroptera	Acanthophlebia				1	4	1			
	Ameletopsis				P		1			
	Austroclima							17	3	2
	Coloburiscus				28	36	35	1		
	Deleatidium		P		48	42	54	66	96	100
	Ichthybotus				1		P			
	Neozephlebia				1					
	Nesameletus				P		P	P	P	P

	Oniscigaster									
	Zephlebia									
Hemiptera	Anisops		1							
	Microvelia		P							
	Sigara									
Hirudinea	Hirudinea									
Lepidoptera	Hygraula									
Megaloptera	Archichauliodes				2	2	7	5	8	3
Mollusca	Ferrissia									
	Gyraulus									
	Latia									
	Lymnaeidae									
	Physa	P	P	18						
	Potamopyrgus	90	90	98		3	2	4	21	11
	Sphaeriidae	3	1							
Nematoda	Nematoda									
Nemertea	Nemertea									
Odonata	Anisoptera									
	Antipodochlora									
	Austrolestes	P								
	Xanthocnemis	2	1	5						
Oligochaeta	Oligochaeta				1		3		1	1
Platyhelminthes	Platyhelminthes		P		P	P		P		

Plecoptera	Austroperla				2	4				
	Megaleptoperla									
	Spaniocerca									
	Stenoperla				1	1	2			
	Taraperla				1					
	Zelandobius						1			
	Zelandoperla				20	11	15		1	P
Trichoptera	Aoteapsyche				4	6	14	49	44	71
	Beraeoptera				1	1	1			
	Costachorema								P	1
	Helicopsyche				6	1	4			
	Hudsonema									
	Hydrobiosella				2	P	1			
	Hydrobiosidae									
	Hydrobiosis				3	1	2	1	7	4
	Hydrochorema				1					
	Hydroptilidae			3						
	Neurochorema								1	
	Oecetis									
	Oeconesidae									
	Olinga				44	58	38	1	1	2
	Orthopsyche									
	Oxyethira							2	1	1
	Paroxyethira									

	Plectrocnemia									
	Polyplectropus	P	P							
	Psilochorema				1	P	P			
	Pycnocentria							2	1	
	Pycnocentroides				1		1	4	3	1
	Triplectides		1							
	Fixed Count	205	278	394	201	213	220	206	221	229
	Squares counted	1	3	1	4	3	2	4	4	4
	TOTAL	6564	2974.333	12609	1612	2276	3525	1650	1770	1835
	TAXA Richness	11	15	6	29	22	26	16	21	17
	MCI-hb	92.72727	98.66667	73.33	143.45	137.27	140.00	115.00	109.52	116.47
	MCI-sb	74.72727	82.93333	44.33	142.76	133.82	141.31	107.25	109.52	114.12
	EPT Richness	1	3	1	19	13	17	10	12	10
	Hydroptilid EPT	0	0	1	0	0	0	1	1	1
	EPT (- Hydropts)	1	3	0	19	13	17	9	11	9
	QMCI-hb	4.512645	4.670739	4.64	8.18	8.00	7.79	6.07	6.12	6.00
	QMCI-sb	3.878824	4.364429	4.33	7.26	7.23	7.02	5.80	5.48	5.65
	% EPT	0.015235	0.425866	0.76	82.01	77.42	77.25	69.39	71.53	79.46
	% Hydropts	0	0	0.76	0.00	0.00	0.00	0.97	0.45	0.44
	% EPT (- Hydropts)	0.015235	0.425866	0.00	82.01	77.42	77.25	68.42	71.07	79.02

Appendix 8.5.5.3 B: Greater Wellington Regional Council macro invertebrate data (2009 sampling round (4-6 of 19 samples, 3 reps per sample)).

	Site No	RS16			RS18			RS19		
	Site Name	Porirua @ Milk Depot			Karori			Kaiwharawhara		
	Rep No	1	2	3	1	2	3	1	2	3
	EOS ID	I090335	I090336	I090337	I090341	I090342	I090343	I090344	I090345	I090346
Generic Grouping	MCI-level taxa									
Acarina	Acarina						1			
Coelenterata	Hydra									
Coleoptera	Antiporus									
	Berosus									
	Elmidae	16	40	31	4	P	P	1	5	2
	Enochrus									
	Hydraenidae						1			
	Hydrophilidae									
	Ptilodactylidae									
	Rhantus									
Collembola	Collembola						3			
Crustacea	Amphipoda					1	1		3	1
	Cladocera									
	Copepoda									
	Cyclograpsus									
	Helice									

	Isopoda									
	Mysidae									
	Ostracoda	1	P		2					
	Paracalliope	3	2		2			21	10	12
	Paranephrops									
	Paratya									
Diptera	Aphrophila				4	3	5	2	P	1
	Austrosimulium	P	1		9	1	2		2	
	Ceratopogonidae									
	Chironominae									
	Chironomus									
	Corynoneura									
	Diamesinae									
	Dolichopodidae									
	Empididae						2	2	1	
	Ephydriidae									
	Eriopterini									
	Harrisius									
	Hexatomini						P			
	Limonia									
	Maoridiamesa						P	2	2	2
	Mischoderus		1	P				2	1	1
	Molophilus					1				
	Muscidae		P	1	2	1	1		1	1

	Neolimnia									
	Nothodixa									
	Orthoclaadiinae	47	85	48	101	92	79	73	47	55
	Paradixa									
	Paralimnophila									
	Peritheates									
	Psychodidae									
	Scatella									
	Stratiomyidae									
	Tabanidae									
	Tanypodinae		P				1			
	Tanytarsini	2	3	1	10	8	1		2	2
	Zelandotipula			P						
Ephemeroptera	Acanthophlebia									
	Ameletopsis				1		1			
	Austroclima	6	5	8		2				
	Coloburiscus						P			
	Deleatidium	11	12	9	44	103	90	1		
	Ichthybotus									
	Neozephlebia									
	Nesameletus					1	1			
	Oniscigaster									
	Zephlebia									
Hemiptera	Anisops									

	Microvelia									
	Sigara									
Hirudinea	Hirudinea									
Lepidoptera	Hygraula									
Megaloptera	Archichauliodes	3	6	5		4	11	16	15	31
Mollusca	Ferrissia		P	1						
	Gyraulus									
	Latia									
	Lymnaeidae									
	Physa			1	2	2	3			
	Potamopyrgus	10	17	48	2	3	2	7	1	4
	Sphaeriidae					1				
Nematoda	Nematoda									
Nemertea	Nemertea									
Odonata	Anisoptera									
	Antipodochlora									
	Austrolestes									
	Xanthocnemis									
Oligochaeta	Oligochaeta	1	4	8	9	4	16	1	5	2
Platyhelminthes	Platyhelminthes									
Plecoptera	Austroperla									1
	Megaleptoperla									
	Spaniocerca				2		P			
	Stenoperla									

	Taraperla									
	Zelandobius								1	
	Zelandoperla									
Trichoptera	Aoteapsyche	14	8	23	P	8	3	22	30	33
	Beraeoptera									
	Costachorema			P	P			P	2	2
	Helicopsyche									
	Hudsonema									
	Hydrobiosella									
	Hydrobiosidae							1		
	Hydrobiosis	2	2	2				P		1
	Hydrochorema									
	Hydroptilidae	11	3	1	2	3	3	24	37	26
	Neurochorema									
	Oecetis									
	Oeconesidae									
	Olinga									
	Orthopsyche				1	1		1		
	Oxyethira	33	42	20	3	5	9	49	43	23
	Paroxyethira									
	Plectrocnemia									
	Polyplectropus									
	Psilochorema									
	Pycnocentria									

	Pycnocentroides									
	Triplectides									
	Fixed Count	160	231	207	200	244	236	225	208	200
	Squares counted	4	4	4	11	9	10	5	5	6
	TOTAL	1281	1852	1659	583.818	868.556	760.2	1442	1332.2	1066.67
	TAXA Richness	15	19	18	19	20	26	18	19	18
	MCI-hb	85.33	83.16	87.78	92.63	93.00	99.2308	94.00	77.89	85.56
	MCI-sb	90.53	88.74	86.00	92.84	91.90	104.846	105.11	95.47	99.00
	EPT Richness	6	6	7	8	7	8	8	5	6
	Hydroptilid EPT	2	2	2	2	2	2	2	2	2
	EPT (- Hydropts)	4	4	5	6	5	6	6	3	4
	QMCI-hb	3.57	3.56	3.95	3.73	4.92	4.78479	3.06	3.03	3.52
	QMCI-sb	3.78	3.93	4.03	4.01	4.45	4.46601	3.59	3.72	4.28
	% EPT	48.09	31.10	30.44	26.75	50.35	45.30	43.63	54.29	43.00
	% Hydropts	27.48	19.44	10.13	2.49	3.27	5.05	32.40	38.43	24.50
	% EPT (- Hydropts)	20.61	11.66	20.31	24.26	47.08	40.2526	11.23	15.85	18.50

Appendix 8.5.5.3 C: Greater Wellington Regional Council macro invertebrate data (2009 sampling round (7-9 of 19 samples, 3 reps per sample)).

	Site No	RS20			RS22			RS24		
	Site Name	Hutt at Te Marua			Hutt at Boulcott			Mangaroa		
	Rep No	1	2	3	1	2	3	1	2	3
	EOS ID	I090347	I090348	I090349	I090353	I090354	I090355	I090359	I090360	I090361
Generic Grouping	MCI-level taxa									
Acarina	Acarina									
Coelenterata	Hydra									
Coleoptera	Antiporus									
	Berosus									
	Elmidae	17	8	8	3	2	5	6	16	15
	Enochrus									
	Hydraenidae		4	3				2		
	Hydrophilidae									
	Ptilodactylidae									
	Rhantus									
Collembola	Collembola									
Crustacea	Amphipoda									
	Cladocera									
	Copepoda									
	Cyclograpsus									
	Helice									

	Isopoda									
	Mysidae									
	Ostracoda									
	Paracalliope						P			
	Paranephrops									
	Paratya									
Diptera	Aphrophila	P		P				P	1	P
	Austrosimulium			1	P	P	1	14	5	15
	Ceratopogonidae									
	Chironominae						P	1		
	Chironomus									
	Corynoneura									
	Diamesinae									
	Dolichopodidae									
	Empididae								1	
	Ephydriidae									
	Eriopterini	P		P		1		P	1	P
	Harrisius									
	Hexatomini									
	Limonia									
	Maoridiamesa								7	1
	Mischoderus									
	Molophilus									
	Muscidae									P

	Neolimnia									
	Nothodixa									
	Orthoclaadiinae		1		3	1	1	4	21	15
	Paradixa									
	Paralimnophila									
	Peritheates									
	Psychodidae									
	Scatella									
	Stratiomyidae								P	
	Tabanidae									P
	Tanypodinae									
	Tanytarsini		1			2			2	4
	Zelandotipula									
Ephemeroptera	Acanthophlebia									
	Ameletopsis									
	Austroclima							6	13	4
	Coloburiscus	7	14	16		1	1	3	10	2
	Deleatidium	90	104	68	195	189	198	151	69	138
	Ichthybotus									
	Neozephlebia		1	2						
	Nesameletus	4	P	P				P		
	Oniscigaster									
	Zephlebia									
Hemiptera	Anisops									

	Microvelia									
	Sigara									
Hirudinea	Hirudinea									
Lepidoptera	Hygraula									
Megaloptera	Archichauliodes	5	2	2	P		P	3	10	3
Mollusca	Ferrissia									
	Gyraulus									
	Latia							1		
	Lymnaeidae									
	Physa									
	Potamopyrgus	1	1		1			4	18	5
	Sphaeriidae									
Nematoda	Nematoda									
Nemertea	Nemertea									
Odonata	Anisoptera									
	Antipodochlora									
	Austrolestes									
	Xanthocnemis									
Oligochaeta	Oligochaeta	1							10	
Platyhelminthes	Platyhelminthes									
Plecoptera	Austroperla	1	2	3						
	Megaleptoperla									
	Spaniocerca									
	Stenoperla	P	P	1						

	Taraperla									
	Zelandobius									
	Zelandoperla	47	35	48	2	1	P		P	P
Trichoptera	Aoteapsyche	9	13	8				9	32	7
	Beraeoptera	5		1				P		
	Costachorema		2		P	P		P	2	P
	Helicopsyche	1								
	Hudsonema									
	Hydrobiosella		1							
	Hydrobiosidae									
	Hydrobiosis	1	2	4	P	1	1	1	2	1
	Hydrochorema									
	Hydroptilidae									
	Neurochorema									
	Oecetis									
	Oeconesidae									
	Olinga	7	16	42			1	1		1
	Orthopsyche									
	Oxyethira									
	Paroxyethira									
	Plectrocnemia		P							
	Polyleptopus									
	Psilochorema	1	P		1	2	2	P		
	Pycnocentria		1	1						P

	Pycnocentroides	1		1						
	Triplectides									
	Fixed Count	198	208	209	205	200	210	204	222	211
	Squares counted	5	5	4	8	17	11	2	5	8
	TOTAL	1270.2	1336	1675	824	378.471	614.909	3270	1422.8	851
	TAXA Richness	19	21	19	10	11	12	19	20	20
	MCI-hb	143.16	141.90	145.26	120.00	127.27	123.33	123.16	111.00	116.00
	MCI-sb	136.84	137.05	139.68	119.80	128.36	126.50	124.32	115.30	118.30
	EPT Richness	13	15	13	5	6	6	10	7	9
	Hydroptilid EPT	0	0	0	0	0	0	0	0	0
	EPT (- Hydropts)	13	15	13	5	6	6	10	7	9
	QMCI-hb	8.12	8.04	8.41	7.87	7.89	7.88	7.19	5.75	6.73
	QMCI-sb	6.86	6.67	7.21	5.62	5.66	5.67	5.53	5.40	5.42
	% EPT	87.75	91.80	93.19	96.36	96.75	96.20	83.79	57.65	72.27
	% Hydropts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	% EPT (- Hydropts)	87.75	91.80	93.19	96.36	96.75	96.20	83.79	57.65	72.27

Appendix 8.5.5.3 D: Greater Wellington Regional Council macro invertebrate data 2009 sampling round (10-12 of 19 samples, 3 reps per sample).

	Site No	RS27			RS36			RS37		
	Site Name	Waiwhetu			Taueru @ Castlehill			Taueru @ Gladstone		
	Rep No	1	2	3	1	2	3	1	2	3
	EOS ID	I090368	I090369	I090370	I090395	I090396	I090397	I090398	I090399	I090400
Generic Grouping	MCI-level taxa									
Acarina	Acarina									1
Coelenterata	Hydra					P				
Coleoptera	Antiporus									
	Berosus					P	P			
	Elmidae					1	P	68	156	34
	Enochrus									
	Hydraenidae									
	Hydrophilidae									
	Ptilodactylidae					P				
	Rhantus									
Collembola	Collembola		1			2				
Crustacea	Amphipoda	13	16	3						
	Cladocera									
	Copepoda									
	Cyclograpsus	P								
	Helice		P							

	Isopoda									
	Mysidae	P	P	P						
	Ostracoda	1						P	1	1
	Paracalliope	P	1	3				161	114	102
	Paranephrops									
	Paratya		P							
Diptera	Aphrophila									
	Austrosimulium				17	1	8	P		
	Ceratopogonidae									
	Chironominae	P	P	P	1					
	Chironomus									
	Corynoneura									
	Diamesinae									
	Dolichopodidae									
	Empididae									
	Ephydriidae									
	Eriopterini									
	Harrisius									
	Hexatomini									
	Limonia				P	P				
	Maoridiamesa									
	Mischoderus									
	Molophilus									
	Muscidae							P	P	P

	Neolimnia									
	Nothodixa									
	Orthoclaadiinae				1	1	1	1		P
	Paradixa				1	P	P			
	Paralimnophila									
	Peritheates									
	Psychodidae									
	Scatella									
	Stratiomyidae						P			
	Tabanidae									P
	Tanypodinae							P		
	Tanytarsini					1		2	P	P
	Zelandotipula									
Ephemeroptera	Acanthophlebia									
	Ameletopsis									
	Austroclima				14	14	34		P	1
	Coloburiscus				1	P				
	Deleatidium				2		2	1	2	
	Ichthybotus									
	Neozephlebia				4					
	Nesameletus									
	Oniscigaster					P				
	Zephlebia				P	P	P			
Hemiptera	Anisops	P								

	Microvelia					2	7			
	Sigara	P		P						
Hirudinea	Hirudinea							P	P	P
Lepidoptera	Hygraula									
Megaloptera	Archichauliodes						P	3	3	1
Mollusca	Ferrissia									
	Gyraulus		P					11	9	12
	Latia									
	Lymnaeidae									
	Physa							10	10	15
	Potamopyrgus	212	191	206	96	177	55	80	64	106
	Sphaeriidae									
Nematoda	Nematoda									
Nemertea	Nemertea									
Odonata	Anisoptera					1				
	Antipodochlora						1			
	Austrolestes									
	Xanthocnemis					P	P			
Oligochaeta	Oligochaeta	2	1	3			2	2	1	6
Platyhelminthes	Platyhelminthes									1
Plecoptera	Austroperla									
	Megaleptoperla									
	Spaniocerca									
	Stenoperla									

	Taraperla									
	Zelandobius									
	Zelandoperla									
Trichoptera	Aoteapsyche				1			7	54	4
	Beraeoptera									
	Costachorema									
	Helicopsyche									
	Hudsonema				3	P	3	1	P	1
	Hydrobiosella									
	Hydrobiosidae									
	Hydrobiosis							P	P	
	Hydrochorema									
	Hydroptilidae								3	1
	Neurochorema									
	Oecetis									
	Oeconesidae									
	Olinga									
	Orthopsyche									
	Oxyethira							5	7	3
	Paroxyethira							P	2	2
	Plectrocnemia									
	Polypsectopus									
	Psilochorema				1		P			
	Pycnocentria				31	4	20	P		

	Pycnocentroides							5	1	2
	Triplectides				37	21	86			
	Fixed Count	228	210	215	210	225	219	357	427	293
	Squares counted	8	9	2	3	1	2	1	1	1
	TOTAL	918	751.667	3443	2242	7210	3512	11432	13670	9381
	TAXA Richness	10	10	7	16	21	19	22	20	22
	MCI-hb	60.00	62.00	62.86	113.75	112.38	108.42	81.82	84.00	76.36
	MCI-sb	67.20	88.60	84.29	121.50	111.43	113.68	82.55	79.40	75.64
	EPT Richness	0	0	0	10	7	7	8	9	7
	Hydroptilid EPT	0	0	0	0	0	0	2	3	3
	EPT (- Hydropts)	0	0	0	10	7	7	6	6	4
	QMCI-hb	4.02	4.06	3.98	5.02	4.48	5.48	4.77	4.93	4.42
	QMCI-sb	2.31	2.41	2.22	4.19	2.91	4.91	4.72	5.36	3.91
	% EPT	0.00	0.00	0.00	44.77	17.36	66.12	5.34	16.17	4.78
	% Hydropts	0.00	0.00	0.00	0.00	0.00	0.00	1.41	2.81	2.05
	% EPT (- Hydropts)	0.00	0.00	0.00	44.77	17.36	66.12	3.94	13.37	2.73

Appendix 8.5.5.3 E: Greater Wellington Regional Council macro invertebrate data 2009 sampling round (13-15 of 19 samples, 3 reps per sample).

	Site No	RS45			RS46			RS47		
	Site Name	Parkvale @ Lowes			Parkvale @ Weir			Waiohine @ Gorge		
	Rep No	1	2	3	1	2	3	1	2	3
	EOS ID	I090422	I090423	I090424	I090425	I090426	I090427	I090428	I090429	I090430
Generic Grouping	MCI-level taxa									
Acarina	Acarina			P		1				
Coelenterata	Hydra						1			
Coleoptera	Antiporus									
	Berosus									
	Elmidae			1	13	3	13	9	14	13
	Enochrus									
	Hydraenidae									P
	Hydrophilidae									
	Ptilodactylidae									
	Rhantus									
Collembola	Collembola			P						
Crustacea	Amphipoda				P		1			
	Cladocera									
	Copepoda									
	Cyclograpsus									
	Helice									
	Isopoda									

	Mysidae									
	Ostracoda				3	6	P			
	Paracalliope	140	124	93	16	49	15			
	Paranephrops	P	2							
	Paratya									
Diptera	Aphrophila							2	P	P
	Austrosimulium				6	10	P	P	P	3
	Ceratopogonidae				1					
	Chironominae	7		4						
	Chironomus									
	Corynoneura									
	Diamesinae									
	Dolichopodidae									
	Empididae									
	Ephydriidae									
	Eriopterini								P	P
	Harrisius		1	P						
	Hexatomini			P						
	Limonia			P						
	Maoridiamesa							P	P	P
	Mischoderus									
	Molophilus									
	Muscidae									
	Neolimnia									

	Nothodixa									
	Orthocladiinae	2	3	11	1	2	23	2	4	P
	Paradixa		P	2						
	Paralimnophila	P								
	Peritheates									
	Psychodidae									
	Scatella									
	Stratiomyidae									
	Tabanidae									
	Tanypodinae	1	1							
	Tanytarsini		1	P	10	8	44			
	Zelandotipula									
Ephemeroptera	Acanthophlebia									
	Ameletopsis									
	Austroclima	5	8	6		2	P	1		
	Coloburiscus									
	Deleatidium	4	3	5				133	165	157
	Ichthybotus									
	Neozephlebia	31	37	38						
	Nesameletus							2	2	3
	Oniscigaster									
	Zephlebia									
Hemiptera	Anisops									
	Microvelia									

	Sigara									
Hirudinea	Hirudinea									
Lepidoptera	Hygraula				P	P				
Megaloptera	Archichauliodes							1	1	1
Mollusca	Ferrissia									
	Gyraulus									
	Latia									
	Lymnaeidae									
	Physa				2	2	1			
	Potamopyrgus	4	9	16	58	28	74	1		
	Sphaeriidae				P					
Nematoda	Nematoda	1			1					
Nemertea	Nemertea									
Odonata	Anisoptera									
	Antipodochlora									
	Austrolestes									
	Xanthocnemis									
Oligochaeta	Oligochaeta	3	12	14	22	16	5			
Platyhelminthes	Platyhelminthes				2	10	1			
Plecoptera	Austroperla							1	P	P
	Megaleptoperla							1		
	Spaniocerca									
	Stenoperla							3	P	P
	Taraperla									

	Zelandobius									
	Zelandoperla							23	12	11
Trichoptera	Aoteapsyche				P	2	1	6	1	3
	Beraeoptera							15	14	7
	Costachorema							1	P	P
	Helicopsyche									
	Hudsonema									
	Hydrobiosella									
	Hydrobiosidae		3							
	Hydrobiosis				3	P	3	2	1	1
	Hydrochorema									
	Hydroptilidae				22	44	3			
	Neurochorema									
	Oecetis									
	Oeconesidae	P	1	P						
	Olinga							4	7	16
	Orthopsyche									
	Oxyethira	1			45	94	15			
	Paroxyethira				3	1	P			
	Plectrocnemia								P	P
	Polypsectopus	2	2							
	Psilochorema	6	3	4				P	P	P
	Pycnocentria	3		5			P			
	Pycnocentroides	1							1	P

	Triplectides	P	1	1						
	Fixed Count	211	211	200	208	278	200	207	222	215
	Squares counted	4	5	3	1	1	1	6	2	4
	TOTAL	1692	1351.4	2140.33	6660	8898	6405	1107	3561	1731
	TAXA Richness	19	17	20	20	18	19	20	20	21
	MCI-hb	106.32	113.65	108.00	66.00	73.33	75.79	135.00	135.00	136.19
	MCI-sb	108.74	119.88	113.20	72.20	73.56	77.47	131.20	133.20	133.24
	EPT Richness	10	8	7	5	6	7	13	13	13
	Hydroptilid EPT	1	0	0	3	3	3	0	0	0
	EPT (- Hydropts)	9	8	7	2	3	4	13	13	13
	QMCI-hb	5.36	5.35	5.10	3.10	2.92	3.51	7.94	7.86	7.92
	QMCI-sb	5.74	5.74	5.50	2.96	2.77	3.41	6.28	6.03	6.12
	% EPT	25.18	27.47	29.45	35.09	51.44	11.04	92.59	91.35	91.85
	% Hydropts	0.47	0.00	0.00	33.63	49.99	9.01	0.00	0.00	0.00
	% EPT (- Hydropts)	24.70	27.47	29.45	1.46	1.45	2.03	92.59	91.35	91.85

Appendix 8.5.5.3 F: Greater Wellington Regional Council macro invertebrate data 2009 sampling round (16-19 of 19 samples, 3 reps per sample).

	Site No	RS48			RS49			RS50			RS53		
	Site Name	Waiohine @ Bicknells			Beef Creek			Mangatarere @ SH2			Awhea		
	Rep No	1	2	3	1	2	3	1	2	3	1	2	3
	EOS ID	I090431	I090432	I090433	I090025	I090026	I090027	I090028	I090029	I090030	I090440	I090441	I090441
Generic Grouping	MCI-level taxa												
Acarina	Acarina												
Coelenterata	Hydra							1					
Coleoptera	Antiporus												
	Berosus									P	6	P	
	Elmidae	30	36	27	11	9	15	39	15	7	175	126	38
	Enochrus												
	Hydraenidae			P	4	P	5			1			
	Hydrophilidae											P	1
	Ptilodactylidae				2	P	P						
	Rhantus												
Collembola	Collembola												
Crustacea	Amphipoda						P						
	Cladocera												1
	Copepoda												
	Cyclograpsus												
	Helice												

	Isopoda				1								
	Mysidae												
	Ostracoda							2	5	1	5	1	
	Paracalliope						17	95	213				
	Paranephrops					P							
	Paratya												
Diptera	Aphrophila	P	P	P	3	1	3						
	Austrosimulium	1	2	4									
	Ceratopogonidae				P						P	1	
	Chironominae					3		5					
	Chironomus												
	Corynoneura												
	Diamesinae												
	Dolichopodidae												P
	Empididae												
	Ephydriidae												
	Eriopterini	P	2	5			1		P		P		P
	Harrisius												
	Hexatomini										P	P	
	Limonia												
	Maoridiamesa												
	Mischoderus												
	Molophilus												
	Muscidae							3	1	1			

	Neolimnia												
	Nothodixa				P	1							
	Orthoclaadiinae	33	8	27	6	7	8	18	29	61	2	13	1
	Paradixa												
	Paralimnophila							1			1		
	Peritheates												
	Psychodidae												
	Scatella												
	Stratiomyidae										P	P	1
	Tabanidae												
	Tanypodinae										2	2	1
	Tanytarsini	70	35	32			1	10	51	55			
	Zelandotipula												
Ephemeroptera	Acanthophlebia				10	3	3						
	Ameletopsis				P	1	P						
	Austroclima	1			5	7	5	10	7	1			
	Coloburiscus				7	19	29						
	Deleatidium	41	120	133	72	98	37	2	11	4	P	1	P
	Ichthyotus				P	3	2						
	Neozephlebia				4	3	3						
	Nesameletus	P	P	P	4		2						
	Oniscigaster												
	Zephlebia												
Hemiptera	Anisops												

	Microvelia												P
	Sigara										P	1	1
Hirudinea	Hirudinea												
Lepidoptera	Hygraula												
Megaloptera	Archichauliodes				8	4	7	1	1	P			
Mollusca	Ferrissia												
	Gyraulus										4	17	15
	Latia												
	Lymnaeidae										P	P	2
	Physa							1			20	47	30
	Potamopyrgus	1	P	1		1		13	8	8	44		93
	Sphaeriidae												
Nematoda	Nematoda												
Nemertea	Nemertea												
Odonata	Anisoptera												
	Antipodochlora												
	Austrolestes												
	Xanthocnemis												
Oligochaeta	Oligochaeta	3	4	2	1	P	1		P	4	21	11	7
Platyhelminthes	Platyhelminthes				6	5	18						
Plecoptera	Austroperla				7	6	9						
	Megaleptoperla												
	Spaniocerca					P							
	Stenoperla				2	2	3						

	Taraperla												
	Zelandobius	1											
	Zelandoperla				14	6	20						
Trichoptera	Aoteapsyche	6	6	3	15	4	25	50	8	P		P	
	Beraeoptera												
	Costachorema	P	P	1	P								
	Helicopsyche					2	P						
	Hudsonema					2		1	P				
	Hydrobiosella				P	4	1						
	Hydrobiosidae												
	Hydrobiosis	9	5	4	2	3	3	26	8	9			P
	Hydrochorema												
	Hydroptilidae							1			3		4
	Neurochorema												
	Oecetis												
	Oeconesidae												
	Olinga	2	P		13	8	14						
	Orthopsyche				1	P	P						
	Oxyethira			1				15	5	7	3	4	5
	Paroxyethira										P	P	1
	Plectrocnemia												
	Polyplectropus											96	
	Psilochorema	1	P	7	P	3	P						
	Pycnocentria	2		P	2		2	13	39	25			

	Pycnocentroides	1						4	2	P		P	
	Triplectides												
	Fixed Count	202	218	247	200	205	217	230	283	401	276	329	203
	Squares counted	2	1	4	4	2	3	6	2	1	1	1	1
	TOTAL	3236	6982	1980	1607	3286	2320. 67	122 6.67	4531	12835	8839	10536	6503
	TAXA Richness	19	15	17	30	31	30	19	19	17	18	20	24
	MCI-hb	114.7 4	110.6 7	107.0 6	138.0 0	136.1 3	142.6 7	93.6 8	96.84	96.47	82.22	83.00	82.50
	MCI-sb	118.0 0	116.8 0	111.0 6	140.6 0	139.2 3	139.8 7	92.9 5	94.00	94.59	78.00	89.50	86.92
	EPT Richness	11	7	8	19	19	19	9	8	7	4	6	5
	Hydroptilid EPT	0	0	1	0	0	0	2	1	1	3	2	3
	EPT (- Hydropts)	11	7	7	19	19	19	7	7	6	1	4	2
	QMCI-hb	4.57	6.30	6.22	7.36	7.57	7.05	4.60	4.75	4.32	4.91	5.56	3.95
	QMCI-sb	5.13	5.61	5.43	6.56	6.34	6.51	5.32	5.20	4.94	5.36	5.73	2.86
	% EPT	31.71	60.10	60.30	78.97	84.78	72.80	53.0 4	28.27	11.48	2.19	30.70	4.95
	% Hydropts	0.00	0.00	0.40	0.00	0.00	0.00	6.96	1.77	1.75	2.18	1.22	4.92

	% EPT (- Hydropts)	31.71	60.10	59.90	78.97	84.78	72.80	46.0 9	26.51	9.74	0.01	29.48	0.03
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8.5.5.4 Greater Wellington Regional Council: Water quality data of sites evaluated in this project.

Table 8.5.5.4: Greater Wellington Regional Council: Water quality data for stream sites as obtained from the council database

WRC Hilltop Site Name	Site No.	Date Collected	Time Collected	Temperature (°C)	Cond μS/cm	Dissolved Oxygen % Sat (Field)	Dissolved Oxygen (Field)	pH
Mangapouri Stream at Bennetts Rd	RS02	19-Jan-2010	14:00	17.19	209	69.0	6.62	6.85
Mangapouri Stream at Bennetts Rd	RS02	09-Feb-2010	13:20	17.54	202	62.0	5.93	6.69
Mangapouri Stream at Bennetts Rd	RS02	10-Mar-2010	14:10	16.46	199	58.7	5.74	6.59
Mangapouri Stream at Bennetts Rd	RS02	13-Apr-2010	13:30	13.22	204	63.3	6.62	6.56
Waikanae River at Mangaone Walkway	RS09	18-Jan-2010	13:00	13.79	87	106.2	11.00	7.10
Waikanae River at Mangaone Walkway	RS09	08-Feb-2010	13:25	16.54	90	97.2	9.48	7.26
Waikanae River at Mangaone Walkway	RS09	09-Mar-2010	12:20	14.06	89	92.9	9.56	7.26
Waikanae River at Mangaone Walkway	RS09	12-Apr-2010	13:50	10.79	89	112.3	12.44	7.30
Horokiri Stream at Snodgrass	RS13	18-Jan-2010	9:30	14.97	189	117.1	11.80	7.54
Horokiri Stream at Snodgrass	RS13	08-Feb-2010	9:45	17.23	193	105.8	10.17	7.49
Horokiri Stream at Snodgrass	RS13	09-Mar-2010	9:15	13.81	195	102.1	10.56	7.17
Horokiri Stream at Snodgrass	RS13	12-Apr-2010	10:45	14.07	197	119.3	12.26	7.32
Porirua Stream at Milk Depot (Wall Park)	RS16	12-Jan-2010	8:40	13.64	227	111.1	11.54	7.24
Porirua Stream at Milk Depot (Wall Park)	RS16	03-Feb-2010	9:10	16.57	264	117.7	11.47	7.63
Porirua Stream at Milk Depot (Wall Park)	RS16	03-Mar-2010	9:45	16.39	270	132.3	12.94	8.02
Porirua Stream at Milk Depot (Wall Park)	RS16	08-Apr-2010	9:30	12.22	277	127.0	13.61	7.89
Karori Stream at Makara Peak Mountain Bike	RS18	12-Jan-2010	11:35	13.84	144	115.4	11.93	6.98
Karori Stream at Makara Peak Mountain Bike	RS18	03-Feb-2010	12:30	17.14	231	109.2	10.53	7.25
Karori Stream at Makara Peak Mountain Bike	RS18	03-Mar-2010	12:30	17.44	232	117.1	11.21	7.38

Karori Stream at Makara Peak Mountain Bike	RS18	08-Apr-2010	12:10	13.00	226	111.8	11.75	7.29
Kaiwharawhara Stream at Ngaio Gorge	RS19	12-Jan-2010	12:45	14.48	207	112.1	11.43	7.35
Kaiwharawhara Stream at Ngaio Gorge	RS19	03-Feb-2010	13:20	19.33	297	115.0	10.60	7.99
Kaiwharawhara Stream at Ngaio Gorge	RS19	03-Mar-2010	13:20	18.81	315	113.1	10.52	7.54
Kaiwharawhara Stream at Ngaio Gorge	RS19	08-Apr-2010	14:10	13.36	315	112.1	11.72	7.62
Hutt River at Te Marua Intake Site	RS20	05-Jan-2010	8:40	12.08	59	104.3	11.21	6.71
Hutt River at Te Marua Intake Site	RS20	01-Feb-2010	8:45	12.67	52	107.4	11.46	6.80
Hutt River at Te Marua Intake Site	RS20	02-Mar-2010	9:10	15.88	78	102.2	10.10	7.22
Hutt River at Te Marua Intake Site	RS20	06-Apr-2010	10:10	12.47	80	108.3	11.55	6.90
Hutt River at Boulcott	RS22	05-Jan-2010	13:10	15.08	76	102.0	10.28	6.63
Hutt River at Boulcott	RS22	01-Feb-2010	13:40	15.40	68	110.2	11.02	7.05
Hutt River at Boulcott	RS22	02-Mar-2010	13:25	18.03	97	105.8	10.01	7.25
Hutt River at Boulcott	RS22	06-Apr-2010	14:00	14.72	104	109.6	11.12	7.00
Mangaroa River at Te Marua	RS24	05-Jan-2010	9:20	14.31	97	102.5	10.49	6.72
Mangaroa River at Te Marua	RS24	01-Feb-2010	9:30	15.96	121	108.7	10.73	7.20
Mangaroa River at Te Marua	RS24	02-Mar-2010	9:45	16.31	110	102.0	10.00	6.90
Mangaroa River at Te Marua	RS24	06-Apr-2010	11:00	13.62	111	108.3	11.25	6.81
Waiwhetu Stream at Wainui Hill Bridge	RS27	07-Jan-2010	11:55	16.80	288	84.0	8.15	6.75
Waiwhetu Stream at Wainui Hill Bridge	RS27	02-Feb-2010	13:10	15.36	229	64.9	6.50	6.52
Waiwhetu Stream at Wainui Hill Bridge	RS27	01-Mar-2010	14:20	16.58	244	49.3	4.80	6.77
Waiwhetu Stream at Wainui Hill Bridge	RS27	07-Apr-2010	14:15	14.18	227	92.3	9.47	6.68
Taueru River at Castlehill	RS36	21-Jan-2010	12:40	16.11	213	96.1	9.45	7.41
Taueru River at Castlehill	RS36	17-Feb-2010	12:40	14.84	246	99.2	10.03	7.45
Taueru River at Castlehill	RS36	18-Mar-2010	11:30	10.59	258	105.0	11.68	7.54
Taueru River at Castlehill	RS36	19-Apr-2010	14:15	11.74	280	103.3	11.19	7.69

Taueru River at Gladstone	RS37	21-Jan-2010	14:15	19.82	439	110.7	10.10	7.82
Taueru River at Gladstone	RS37	17-Feb-2010	14:30	19.20	431	100.0	9.23	7.73
Taueru River at Gladstone	RS37	18-Mar-2010	13:25	15.76	437	159.9	15.84	8.42
Taueru River at Gladstone	RS37	19-Apr-2010	15:45	14.20	456	145.3	14.90	8.08
Parkvale tributary at Lowes Reserve	RS45	26-Jan-2010	13:30	14.76	188	72.9	7.17	6.33
Parkvale tributary at Lowes Reserve	RS45	22-Feb-2010	14:20	15.90	197	80.7	7.69	6.33
Parkvale tributary at Lowes Reserve	RS45	30-Mar-2010	14:10	14.29	184	72.6	7.42	6.18
Parkvale tributary at Lowes Reserve	RS45	27-Apr-2010	14:45	14.28	192	70.7	7.22	6.44
Parkvale Stream at Weir	RS46	26-Jan-2010	12:40	18.60	182	85.5	8.00	6.76
Parkvale Stream at Weir	RS46	22-Feb-2010	13:30	20.89	134	109.7	11.74	7.72
Parkvale Stream at Weir	RS46	30-Mar-2010	13:15	15.77	137	112.5	11.15	7.37
Parkvale Stream at Weir	RS46	27-Apr-2010	13:55	15.83	130	99.5	9.85	7.28
Waiohine River at Gorge	RS47	26-Jan-2010	8:00	12.63	54	102.8	10.93	6.87
Waiohine River at Gorge	RS47	22-Feb-2010	8:30	13.13	55	101.7	10.26	7.04
Waiohine River at Gorge	RS47	30-Mar-2010	8:15	10.24	59	106.5	11.95	7.02
Waiohine River at Gorge	RS47	27-Apr-2010	12:15	12.60	52	103.9	11.03	7.41
Waiohine River at Bicknells	RS48	26-Jan-2010	11:05	14.93	71	101.7	10.27	6.61
Waiohine River at Bicknells	RS48	22-Feb-2010	11:05	16.16	69	97.8	9.71	6.68
Waiohine River at Bicknells	RS48	30-Mar-2010	11:20	14.27	75	99.1	10.15	6.51
Waiohine River at Bicknells	RS48	27-Apr-2010	9:55	13.20	68	97.9	10.27	6.75
Beef Creek at headwaters	RS49	26-Jan-2010	9:10	12.19	83	103.0	11.05	6.84
Beef Creek at headwaters	RS49	22-Feb-2010	9:35	11.86	106	106.4	10.58	7.22
Beef Creek at headwaters	RS49	30-Mar-2010	9:15	10.33	95	104.8	11.73	7.14
Beef Creek at headwaters	RS49	27-Apr-2010	11:20	12.31	116	99.1	10.60	7.53
Mangatarere River at State Highway 2	RS50	26-Jan-2010	11:50	16.35	101	93.9	9.20	6.54

Mangatarere River at State Highway 2	RS50	22-Feb-2010	11:50	18.38	105	125.4	10.78	7.40
Mangatarere River at State Highway 2	RS50	30-Mar-2010	12:30	15.27	111	96.8	9.70	6.46
Mangatarere River at State Highway 2	RS50	27-Apr-2010	13:05	15.41	143	119.8	11.97	6.84
Awhea River at Tora Rd	RS53	27-Jan-2010	11:00	20.28	377	95.0	8.58	7.85
Awhea River at Tora Rd	RS53	23-Feb-2010	11:30	20.97	480	122.8	11.04	7.98
Awhea River at Tora Rd	RS53	23-Mar-2010	11:10	18.48	491	110.2	10.31	8.03
Awhea River at Tora Rd	RS53	26-Apr-2010	13:45	17.06	499	125.2	12.07	8.11

8.5.6 Tasman Regional Council

8.5.6.1 Sample storage: Stream identifier codes

Table 8.5.6.1: Tasman Regional Council: Sample labeling with stream identifier codes.

	STREAM	SHORT CODE LABEL	STREAM IDENTIFIER #
1	Jimmy-Lee Creek at 35 Beach Rd	JLB1	TS10_JLB1
2		JLB2	TS10_JLB2
3		JLB3	TS10_JLB3
4		JLB4	TS10_JLB4
5		JLB5	TS10_JLB5
6	Jimmy-Lee creek at upstream of Hill street	JLH1	TS10_JLH1
7		JLH2	TS10_JLH2
8		JLH3	TS10_JLH3
9		JLH4	TS10_JLH4
10		JLH5	TS10_JLH5
11	Jimmy-Lee Creek at downstream of washbourne Gardens	JLW1	TS10_JLW1
12		JLW2	TS10_JLW2
13		JLW3	TS10_JLW3
14		JLW4	TS10_JLW4
15		JLW5	TS10_JLW5
16	Reservoir Creek at downstream of Salisbury	RES1	TS10_RES1
17		RES2	TS10_RES2
18		RES3	TS10_RES3
19		RES4	TS10_RES4
20		RES5	TS10_RES5
21	Borck Creek at 200m downstream of Queen street	BOR1	TS10_BOR1
22		BOR2	TS10_BOR2
23		BOR3	TS10_BOR3
24		BOR4	TS10_BOR4

25		BOR5	TS10_BOR5
26	Tasman Valley upstream at upstream of Jester house	TAS1	TS10_TAS1
27		TAS2	TS10_TAS2
28		TAS3	TS10_TAS3
29		TAS4	TS10_TAS4
30		TAS5	TS10_TAS5
31	Reservoir Creek upstream of Marlborough River	RM1	TS10_RM1
32		RM2	TS10_RM2
33		RM3	TS10_RM3
34		RM4	TS10_RM4
35		RM5	TS10_RM5
36	Redwood valley stream at upstream of Eves valley stream	RED1	TS10_RED1
37		RED2	TS10_RED2
38		RED3	TS10_RED3
39		RED4	TS10_RED4
40		RED5	TS10_RED5

8.5.6.2 Catchment land-use data

Table 8.5.6.2: Tasman Regional Council - Catchment land-use data for streams investigated.

Site name	% Exotic forest	% Native forest	% Pasture	% Urban
Jimmy-Lee Creek at 35 Beach Rd	20	10	5	65
Jimmy-Lee creek at upstream of Hill street	50	20	25	5
Jimmy-Lee Creek d/stream of washbourne Gardens	30	20	10	40
Reservoir Creek at downstream of Salisbury	25	13	12	50
Borck Creek at 200m downstream of Queen street	40	10	20	30
Tasman Valley upstream of Jester house	0	10	85	5
Reservoir Creek upstream of Marlborough River	50	30	20	0
Redwood valley stream at upstream of Eves valley stream	65	0	30	5

8.5.6.3 Tasman Regional Council: Macro invertebrate data of streams investigated (2009 sampling round).

Table 8.5.6.3: Tasman Regional Council: Macroinvertebrate data for stream sites investigated.

Site	Redwood Valley Strm	Reservoir Ck	Reservoir Ck	Tasman Ck	Jimmy-Lee Ck	Jimmy-Lee Ck	Jimmy-Lee Ck	Borck Creek
Site location	u/s Eves Valley	Marlborough Cres.	Salisbury Rd.	u/s Jester House	Upstream Hill St	Washbourne Gardens (Begonia House)	35 Beach Rd	400m d/s Queen St
<i>Ameletopsis perscitus</i>	0	0	0	0	0	0	0	0
<i>Austroclima jollyae</i>	0	0	0	0	0	0	0	0
<i>Austroclima sepia</i>	0	2	0	0	0	0	0	0
<i>Coloburiscus humeralis</i>	0	0	0	0	0	0	0	0
<i>Deleatidium</i> spp.	0	4	1	0	2	0	0	0
<i>Neozephlebia scita</i>	0	2	0	0	0	0	0	0
<i>Nesameletus</i> sp.	0	0	0	0	0	0	0	0
<i>Zephlebia versicolor</i>	0	0	0	0	0	0	0	0
<i>Megaleptoperla diminuta</i>	0	2	0	0	0	0	0	0
<i>Spaniocerca zelandica</i>	0	1	0	0	0	0	0	0
<i>Stenoperla prasina</i>	0	0	0	0	0	0	0	0
<i>Zelandobius confusus</i> - group	0	0	0	0	0	0	0	0
<i>Zelandoperla decorata</i>	0	0	0	0	0	0	0	0
<i>Archicauliodes diversus</i>	0	0	0	0	2	0	0	0

<i>Procordulia smithi</i>	0	0	0	1	0	0	0	0
<i>Xanthocnemis</i> sp.	2	0	0	3	0	0	0	1
<i>Microvelia</i> sp.	1	0	0	1	0	0	0	0
<i>Sigara</i> sp.	2	0	0	0	0	0	0	0
Hydrophilidae	0	0	0	0	1	0	0	0
Scirtidae	0	0	0	0	0	0	0	0
Anthomyiidae	0	0	2	0	0	0	2	1
<i>Aphrophila neozelandica</i>	0	0	0	0	0	0	0	0
<i>Austrosimulium</i> spp.	0	2	2	0	0	0	0	0
Ceratopogonidae	0	0	0	0	1	0	0	0
<i>Chironomus</i> sp. 'a'	2	0	0	1	0	0	1	0
<i>Chironomus zealandicus</i>	2	0	0	0	0	0	0	0
<i>Corynoneura</i> sp.	0	0	0	1	1	0	0	0
Culicidae (P)	0	0	1	0	0	0	0	0
Empididae	1	0	0	0	0	0	0	0
Ephydriidae	0	0	0	1	0	0	0	0
Eriopterini	0	0	0	0	1	0	0	0
Hexatomini	0	0	0	1	0	0	0	0
<i>Mischoderus</i> sp.	0	1	0	0	0	0	0	0
Muscidae	0	0	0	0	1	0	0	0
<i>Nothodixa campbelli</i>	0	0	0	0	1	0	0	0
<i>Nothodixa</i> sp.	0	0	0	0	0	0	0	0
Orthoclaadiinae	1	1	4	0	3	4	5	4

<i>Paradixa</i> sp.	1	0	0	0	0	0	0	0
<i>Paralimnophila skusei</i>	0	0	1	0	0	0	0	0
<i>Polypedilum</i> sp.	1	0	0	0	3	0	0	0
Psychodidae	0	0	0	0	1	0	0	0
<i>Stictocladius</i> sp.	0	0	0	0	0	0	0	0
Tanypodinae	0	1	0	3	0	0	0	1
<i>Tanytarsus funebris</i>	0	0	0	0	0	0	0	0
<i>Tanytarsus vespertinus</i>	2	0	0	0	0	0	0	0
TRICOPTERA (Caddisflies)	0	0	0	0	0	0	0	0
<i>Aoteasyche</i> spp.	0	3	0	0	0	0	0	0
<i>Beraeoptera roria</i>	0	0	0	0	0	0	0	0
<i>Helicopsyche</i> sp.	0	0	0	0	0	0	0	0
<i>Hudsonema amabile</i>	1	1	0	3	0	0	0	2
<i>Oeconesus similis</i>	0	1	0	0	1	0	0	0
<i>Olinga</i> spp.	0	0	1	0	0	0	0	0
<i>Oxyethira albiceps</i>	2	0	2	3	0	0	2	3
<i>Paroxyethira hendersoni</i>	1	0	0	0	0	0	0	1
<i>Polyplectropus puerilis</i>	0	1	0	0	0	0	0	0
<i>Psilochorema tautoru</i>	0	0	0	0	1	0	0	0
<i>Psilochorema</i> sp.	1	0	0	0	0	0	0	0
<i>Triplectides cephalotes</i>	1	0	1	2	0	0	0	1
<i>Triplectides obsoletus</i>	1	1	0	0	0	0	0	0
Ostracoda	3	3	0	4	3	1	2	2

<i>Paracalliope</i> sp.	3	2	0	4	0	2	1	5
<i>Paranephrops planifrons</i>	0	1	0	0	0	0	0	0
<i>Paratya curvirostris</i>	0	0	0	2	0	0	0	0
Talitridae	0	3	0	0	1	1	0	3
<i>Gyraulus</i> sp.	1	0	1	0	0	0	0	0
<i>Physa acuta</i>	4	0	0	1	0	0	2	3
<i>Potamopyrgus</i> spp.	5	4	4	2	0	0	0	0
Sphaeriidae	0	0	0	1	0	0	0	2
<i>Alboglossiphonia</i> sp.	1	0	0	0	0	0	0	0
NEMATODA (Roundworms)	0	0	0	0	1	0	0	1
NEMATOMORPHA	0	0	0	0	0	1	2	0
NEMERTEA	0	0	0	0	0	0	0	0
OLIGOCHAETA (Worms)	3	2	3	3	3	5	3	3
PLATYHELMINTHES (Flatworms)	0	2	0	0	0	0	0	0
<i>Arrenurus</i> sp.	0	0	0	1	0	0	0	0
Oribatidae	0	0	1	0	2	1	2	1
<i>Hydrachna maramauensis</i>	0	0	0	0	0	0	0	1
COLLEMBOLA (Springtails)	0	1	2	0	2	0	0	0
MCI	72	108	86	79	92	69	56	74
SQMCI	3.74	5.52	2.95	3.96	3.26	1.22	2.03	4.29
Number of taxa	23	22	14	19	19	7	10	17
Number of EPT taxa (excl. Hydroptilidae)	4	10	3	2	3	0	0	2
%EPT richness (excl. Hydroptilidae)	17.39	45.45	21.43	10.53	15.79	0.00	0.00	11.76

8.5.6.4 Tasman Regional Council: Water quality data of streams investigated

Table 8.5.6.4: Tasman Regional Council: Water quality data for stream sites investigated.

Site name	Temperature oC	Conductivity uS/cm	pH	Dissolved oxygen%
Tasman Valley Stm @ u-s Jester House	13.96	224	6.71	41.6
Borck Ck @ 400m d-s Queen St	13.8	331	5.7	105.1
Jimmy-Lee @ u-s Hill St	16	198	7.8	87.8
Jimmy-Lee @ 35 Beach Rd	19	60	6.7	86.5
Jimmy-Lee @ d-s Washbourne Gardens	17	296	7.55	64.8
Reservoir Ck @ d-s Salisbury Rd	23.2	246		110.8
Redwood Vly Stm @ u-s Eves Valley Stm	11.9	172	6.3	77

8.5.7 Environment Canterbury

8.5.7.1 Sample storage: Stream identifier codes

Table 8.5.7.1: Site ID and details of streams sampled for biofilm communities

	SITE_ID	Stream name	Stream type	MGRIDE	MGRIDN
1		Kaituna Stm	Banks Peninsula	2484799	5718303
2		Okuti River	Banks Peninsula	2496532	5713576
3		Balguerie Stream	Banks Peninsula	2507732	5711156
4		Pawsons Stream	Banks Peninsula	2505300	5719400
5		Prices Stm	Banks Peninsula	2487499	5715970
6		Prices tributary	Banks Peninsula	2487552	5715970
7		Okana River	Banks Peninsula	2493699	5715923
8		Harmans/Opuahou Stream	Banks Peninsula	2496452	5718090
9		Aylmers Stream	Banks Peninsula	2506972	5710656
10		Takamatua Stream	Banks Peninsula	2507679	5713943
11	SQ00284	Omarama Stream at SH8	Foothill	2268100	5630900
12	SQ00268	Ophi at SH1	Foothill	2372200	5659100
13	SQ30103	Pahau R at SH7	Foothill	2496025	5823331
14	SQ00037	Ashley River-SH1	Foothill	2484500	5770000
15	SQ00036	Ashley River-Ashley Gorge	Foothill	2447300	5775400
16	SQ00142	Selwyn R @ Whitecliffs Domain	Foothill	2420600	5749400
17	SQ33962	Waipara River @ Laichmore Rd	Foothill	2476590	5794100
18	SQ00243	Pareora River - Cave-Pareora Rd bridge	Foothill	2348700	5646300
19	SQ00292	Spring Creek	Inter-montane basin	2272600	5647800
20	SQ00290	Mary Burn	Inter-montane basin	2296000	5666900
21	SQ00287	Quail Burn	Inter-montane basin	2265500	5635500
22	SQ00208	Halls Stream	Inter-montane basin	2332900	5676500
23	SQ00288	Fork Stream	Inter-montane basin	2302500	5686500
24	SQ26369	Irishman Creek	Inter-montane basin	2297713	5676644
25	SQ00214	Raincliff Stream	Inter-montane basin	2349200	5669000
26	SQ00257	Glenfield Stream	Inter-montane	2337800	5677300

			basin		
27	SQ00258	Coal Stream	Inter-montane basin	2339000	5672600
28	SQ00165	School Stm	Inter-montane basin	2497700	5826300
29	SQ33729	Dry Stream	Inter-montane basin	2495000	5821500
30	SQ00373	Ealing Spring	Lowland	2382200	5683200
31	SQ20541	Petries Creek at Canal Rd	Lowland	2382750	5663290
32	SQ21045	Ohapi Creek at Guild Rd	Lowland	2376290	5664470
33	SQ00298	Waikakahi at Glenavy Tawai Rd	Lowland	2358000	5586800
34	SQ00017	Cust Main Drain at Skewbridge Rd	Lowland	2479900	5759500
35	SQ00103	Selwyn Rr at Coe's Ford	Lowland	2462600	5723400
36	SQ30976	Boggy Ck at Lake Rd	Lowland	2458304	5715571
37	SQ33274	Lyell Creek at Mill Rd	Lowland	2565900	5869865
38	SQ30213	Taranaki Ck at Preeces Rd bridge	Lowland	2484800	5766900
39	SQ00018	Kaiapoi River at NIWA fish hatchery	Lowland	2476500	5754600
40	SQ00035	Styx River-Styx Mill Reserve	Lowland-urban	2477500	5749300
41	SQ00063	Dudley Creek	Lowland-urban	2482800	5744100
42	SQ00128	Avon-Victoria Square	Lowland-urban	2480500	5742200
43	SQ00130	Waimari	Lowland-urban	2477000	5742800
44		Curletts Rd drain	Lowland-urban	2476273	5740020
45	SQ00141	Heathcote River	Lowland-urban	2476301	5739306
46	SQ00120	Ashburton R Nth	Mountain	2393700	5726800
47	SQ00132	Bush Stm	Mountain	2337400	5729200
48	SQ00168	Hurunui R at SH7 bridge	Mountain	2491000	5814900
49	SQ33270	Kowhai River at SH1	Mountain	2562094	5865491
50	SQ00294	Opuha River below Skiptons bridge	Mountain	2348200	5678800

8.5.7.2 Sample storage details: Stream identifier codes

Table 8.5.7.2: Sample labeling with stream identifier codes and stored as shown

	SITE_ID	Stream name	Stream type	MGRIDE	MGRIDN	3-letter code	stream identifier codes
1		Okana River	Banks Peninsula	2493699	5715923	OKN1	CB10_OKN1
2						OKN2	CB10_OKN2
3						OKN3	CB10_OKN3
4						OKN4	CB10_OKN4
5						OKN5	CB10_OKN5
6	SQ00036	Ashley River-Ashley Gorge	Foothill	2447300	5775400	AG1	CB10_AG1
7						AG2	CB10_AG2
8						AG3	CB10_AG3
9						AG4	CB10_AG4
10						AG5	CB10_AG5
11		Harmans/Opuahou Stream	Banks Peninsula	2496452	5718090	HRM1	CB10_HRM1
12						HRM2	CB10_HRM2
13						HRM3	CB10_HRM3
14						HRM4	CB10_HRM4
15						HRM5	CB10_HRM5
16	SQ00017	Cust Main Drain at Skewbridge Rd	Lowland	2479900	5759500	CMD1	CB10_CMD1
17						CMD2	CB10_CMD2
18						CMD3	CB10_CMD3
19						CMD4	CB10_CMD4
20						CMD5	CB10_CMD5
21	SQ00258	Coal Stream	Inter-montane basin	2339000	5672600	CL1	CB10_CL1
22						CL2	CB10_CL2
23						CL3	CB10_CL3
24						CL4	CB10_CL4
25						CL5	CB10_CL5
26		Takamatua Stream	Banks Peninsula	2507679	5713943	TKM1	CB10_TKM1
27						TKM2	CB10_TKM2
28						TKM3	CB10_TKM3
29						TKM4	CB10_TKM4

30						TKM5	CB10_TKM5
31	SQ00284	Omarama Stream at SH8	Foothill	2268100	5630900	OMR1	CB10_OMR1
32						OMR2	CB10_OMR2
33						OMR3	CB10_OMR3
34						OMR4	CB10_OMR4
35						OMR5	CB10_OMR5
36	SQ00018	Kaiapoi River -NIWA fish hatchery	Lowland	2476500	5754600	KP1	CB10_KP1
37						KP2	CB10_KP2
38						KP3	CB10_KP3
39						KP4	CB10_KP4
40						KP5	CB10_KP5
41	SQ00142	Selwyn R @ Whitecliffs Domain	Foothill	2420600	5749400	SEL1	CB10_SEL1
42						SEL2	CB10_SEL2
43						SEL3	CB10_SEL3
44						SEL4	CB10_SEL4
45						SEL5	CB10_SEL5
46		Pawsons Stream	Banks Peninsula	2505300	5719400	PAW1	CB10_PAW1
47						PAW2	CB10_PAW2
48						PAW3	CB10_PAW3
49						PAW4	CB10_PAW4
50						PAW5	CB10_PAW5
51	SQ30103	Pahau R at SH7	Foothill	2496025	5823331	PAH1	CB10_PAH1
52						PAH2	CB10_PAH2
53						PAH3	CB10_PAH3
54						PAH4	CB10_PAH4
55						PAH5	CB10_PAH5
56		Kaituna Stm	Banks Peninsula	2484799	5718303	KTN1	CB10_KTN1
57						KTN2	CB10_KTN2
58						KTN3	CB10_KTN3
59						KTN4	CB10_KTN4
60						KTN5	CB10_KTN5
61		Prices Stm	Banks Peninsula	2487499	5715970	PRS1	CB10_PRS1
62						PRS2	CB10_PRS2
63						PRS3	CB10_PRS3

64						PRS4	CB10_PRS4
65						PRS5	CB10_PRS5
66		Prices tributary	Banks Peninsula	2487552	5715970	PRT1	CB10_PRT1
67						PRT2	CB10_PRT2
68						PRT3	CB10_PRT3
69						PRT4	CB10_PRT4
70						PRT5	CB10_PRT5
71	SQ00287	Quail Burn	Inter-montane basin	2265500	5635500	QLB1	CB10_QLB1
72						QLB2	CB10_QLB2
73						QLB3	CB10_QLB3
74						QLB4	CB10_QLB4
75						QLB5	CB10_QLB5
76	SQ00168	Hurunui R at SH7 bridge	Mountain	2491000	5814900	HRN1	CB10_HRN1
77						HRN2	CB10_HRN2
78						HRN3	CB10_HRN3
79						HRN4	CB10_HRN4
80						HRN5	CB10_HRN5
81		Aylmers Stream (Akaroa on sponges)	Banks Peninsula	2506972	5710656	AKR1	CB10_AKR1
82						AKR2	CB10_AKR2
83						AKR3	CB10_AKR3
84						AKR4	CB10_AKR4
85						AKR5	CB10_AKR5
86		Balguerrie Stream	Banks Peninsula	2507732	5711156	BAL1	CB10_BAL1
87						BAL2	CB10_BAL2
88						BAL3	CB10_BAL3
89						BAL4	CB10_BAL4
90						BAL5	CB10_BAL5
91	SQ26369	Irishman Creek	Inter-montane basin	2297713	5676644	IRC1	CB10_IRC1
92						IRC2	CB10_IRC2
93						IRC3	CB10_IRC3
94						IRC4	CB10_IRC4
95						IRC5	CB10_IRC5
96		Okuti River	Banks Peninsula	2496532	5713576	OKU1	CB10_OKU1

97						OKU2	CB10_OKU2
98						OKU3	CB10_OKU3
99						OKU4	CB10_OKU4
100						OKU5	CB10_OKU5
101	SQ00290	Mary Burn	Inter-montane basin	2296000	5666900	MB1	CB10_MB1
102						MB2	CB10_MB2
103						MB3	CB10_MB3
104						MB4	CB10_MB4
105						MB5	CB10_MB5
106	SQ00257	Glenfield Stream	Inter-montane basin	2337800	5677300	GLN1	CB10_GLN1
107						GLN2	CB10_GLN2
108						GLN3	CB10_GLN3
109						GLN4	CB10_GLN4
110						GLN5	CB10_GLN5
111	SQ00288	Fork Stream	Inter-montane basin	2302500	5686500	FRK1	CB10_FRK1
112						FRK2	CB10_FRK2
113						FRK3	CB10_FRK3
114						FRK4	CB10_FRK4
115						FRK5	CB10_FRK5
116	SQ30976	Boggy Ck at Lake Rd	Lowland	2458304	5715571	BOG1	CB10_BOG1
117						BOG2	CB10_BOG2
118						BOG3	CB10_BOG3
119						BOG4	CB10_BOG4
120						BOG5	CB10_BOG5
121	SQ33729	Dry Stream	Inter-montane basin	2495000	5821500	DRY1	CB10_DRY1
122						DRY2	CB10_DRY2
123						DRY3	CB10_DRY3
124						DRY4	CB10_DRY4
125						DRY5	CB10_DRY5
126	SQ33270	Kowhai River at SH1	Mountain	2562094	5865491	KOW1	CB10_KOW1
127						KOW2	CB10_KOW2
128						KOW3	CB10_KOW3
129						KOW4	CB10_KOW4
130						KOW5	CB10_KOW5
131	SQ00103	Selwyn Rr at Coe's Ford	Lowland	2462600	5723400	SR1	CB10_SR1

132						SR2	CB10_SR2
133						SR3	CB10_SR3
134						SR4	CB10_SR4
135						SR5	CB10_SR5
136	SQ00208	Halls Stream	Inter-montane basin	2332900	5676500	HAL1	CB10_HAL1
137						HAL2	CB10_HAL2
138						HAL3	CB10_HAL3
139						HAL4	CB10_HAL4
140						HAL5	CB10_HAL5
141	SQ00165	School Stm	Inter-montane basin	2497700	5826300	SKL1	CB10_SKL1
142						SKL2	CB10_SKL2
143						SKL3	CB10_SKL3
144						SKL4	CB10_SKL4
145						SKL5	CB10_SKL5
146	SQ00214	Raincliff Stream	Inter-montane basin	2349200	5669000	RAN1	CB10_RAN1
147						RAN2	CB10_RAN2
148						RAN3	CB10_RAN3
149						RAN4	CB10_RAN4
150						RAN5	CB10_RAN5
151	SQ00292	Spring Creek	Inter-montane basin	2272600	5647800	SPR1	CB10_SPR1
152						SPR2	CB10_SPR2
153						SPR3	CB10_SPR3
154						SPR4	CB10_SPR4
155						SPR5	CB10_SPR5
156	SQ00130	Waimari	Lowland-urban	2477000	5742800	WMR1	CB10_WMR1
157						WMR2	CB10_WMR2
158						WMR3	CB10_WMR3
159						WMR4	CB10_WMR4
160						WMR5	CB10_WMR5
161	SQ33962	Waipara River @ Laidmore Rd	Foothill	2476590	5794100	WPR1	CB10_WPR1
162						WPR2	CB10_WPR2
163						WPR3	CB10_WPR3
164						WPR4	CB10_WPR4

165						WPR5	CB10_WPR5
166	SQ00037	Ashley River-SH1	Foothill	2484500	5770000	ASH1	CB10_ASH1
167						ASH2	CB10_ASH2
168						ASH3	CB10_ASH3
169						ASH4	CB10_ASH4
170						ASH5	CB10_ASH5
171	SQ30213	Taranaki Ck at Preeces Rd bridge	Lowland	2484800	5766900	TNK1	CB10_TNK1
172						TNK2	CB10_TNK2
173						TNK3	CB10_TNK3
174						TNK4	CB10_TNK4
175						TNK5	CB10_TNK5
176	SQ33274	Lyell Creek at Mill Rd	Lowland	2565900	5869865	LYL1	CB10_LYL1
177						LYL2	CB10_LYL2
178						LYL3	CB10_LYL3
179						LYL4	CB10_LYL4
180						LYL5	CB10_LYL5
181	SQ00128	Avon-Victoria Square	Lowland-urban	2480500	5742200	VIC1	CB10_VIC1
182						VIC2	CB10_VIC2
183						VIC3	CB10_VIC3
184						VIC4	CB10_VIC4
185						VIC5	CB10_VIC5
186	SQ00373	Ealing Spring	Lowland	2382200	5683200	EAL1	CB10_EAL1
187						EAL2	CB10_EAL2
188						EAL3	CB10_EAL3
189						EAL4	CB10_EAL4
190						EAL5	CB10_EAL5
191	SQ00268	Opihi at SH1	Foothill	2372200	5659100	OPH1	CB10_OPH1
192						OPH2	CB10_OPH2
193						OPH3	CB10_OPH3
194						OPH4	CB10_OPH4
195						OPH5	CB10_OPH5
196		Curletts Rd drain	Lowland-urban	2476273	5740020	CUR1	CB10_CUR1
197						CUR2	CB10_CUR2
198						CUR3	CB10_CUR3
199						CUR4	CB10_CUR4
200						CUR5	CB10_CUR5

201	SQ00243	Pareora River - Cave- Pareora Rd bridge	Foothill	2348700	5646300	PAR1	CB10_PAR1
202						PAR2	CB10_PAR2
203						PAR3	CB10_PAR3
204						PAR4	CB10_PAR4
205						PAR5	CB10_PAR5
206	SQ00063	Dudley Creek	Lowland- urban	2482800	5744100	DUD1	CB10_DUD1
207						DUD2	CB10_DUD2
208						DUD3	CB10_DUD3
209						DUD4	CB10_DUD4
210						DUD5	CB10_DUD5
211	SQ00035	Styx River-Styx Mill Reserve	Lowland- urban	2477500	5749300	STX1	CB10_STX1
212						STX2	CB10_STX2
213						STX3	CB10_STX3
214						STX4	CB10_STX4
215						STX5	CB10_STX5
216	SQ00294	Opuha River below Skiptons bridge	Mountain	2348200	5678800	OPU1	CB10_OPU1
217						OPU2	CB10_OPU2
218						OPU3	CB10_OPU3
219						OPU4	CB10_OPU4
220						OPU5	CB10_OPU5
221	SQ00141	Heathcote River	Lowland- urban	2476301	5739306	HC1	CB10_HC1
222						HC2	CB10_HC2
223						HC3	CB10_HC3
224						HC4	CB10_HC4
225						HC5	CB10_HC5
226	SQ20541	Petries Creek at Canal Rd	Lowland	2382750	5663290	PET1	CB10_PET1
227						PET2	CB10_PET2
228						PET3	CB10_PET3
229						PET4	CB10_PET4
230						PET5	CB10_PET5
231	SQ00132	Bush Stm	Mountain	2337400	5729200	BSH1	CB10_BSH1
232						BSH2	CB10_BSH2
233						BSH3	CB10_BSH3
234						BSH4	CB10_BSH4

235						BSH5	CB10_BSH5
236	SQ00298	Waikakahi at Glenavy Tawai Rd	Lowland	2358000	5586800	WK1	CB10_WK1
237						WK2	CB10_WK2
238						WK3	CB10_WK3
239						WK4	CB10_WK4
240						WK5	CB10_WK5
241	SQ21045	Ohapi Creek at Guild Rd	Lowland	2376290	5664470	OHP1	CB10_OHP1
242						OHP2	CB10_OHP2
243						OHP3	CB10_OHP3
244						OHP4	CB10_OHP4
245						OHP5	CB10_OHP5
246	SQ00120	Ashburton R Nth	Mountain	2393700	5726800	ABT1	CB10_ABT1
247						ABT2	CB10_ABT2
248						ABT3	CB10_ABT3
249						ABT4	CB10_ABT4
250						ABT5	CB10_ABT5

8.5.7.3 Catchment land-use data

Table 8.5.7.3 A: Canterbury Regional Council - Catchment land use data (1-13 of 37 categories).

SITE_ID	Hydrological Catchment Name	Total area (sq m)	Afforestation station (imaged, post LCDB 1)	Afforestation (not imaged)	Alpine Grass-/Herbfield	Alpine Gravel and Rock	Broad leaved Indigenous Hardwoods	Built-up Area	Deciduous Hardwoods	Depleted Tussock Grassland	Fermland	Flax land	Forest Harvested	Gorse and Broom
N/A	Okuti River	9229060					1172310						16382.5	
N/A	Opuahau Stream	47826053	1558690				4445166	123057.6	52383.31					325352.9
N/A	Takamatua Stream	11942051	9858.112				992625.7	25074.3	13348.13					1623695
SQ00017	Cust River	2.01E+08	66389.95				1763020	2305949	131904.9				18225	666376.5
SQ00018	Kaiapoi River	5837156							85017.09					
SQ00035	Styx River	4817562						931740.5	135968.9					
SQ00037	Ashley River	1.17E+09	1325303	817938		13774921	17110853	1977765	15041714	598580.8			10900187	43116880
SQ00063	Dudley Creek	19766818						14434589	27139.55					
SQ00102	Kaituna River	31476613		2211.008			3710039							288514.1
SQ00103	Selwyn River - Coes Ford	7.37E+08	3541383	914579.9		917971.7	2411610	1524029	5766265		108476.9	37065	2070704	39516034
SQ00120	Ashburton River North Branch	3.37E+08	622434.9			1.22E+08	2797081		1734725	2754673			17250.12	1679197
SQ00128	Avon River	37085746						30831293	1058640					
SQ00132	Bush Creek	1.4E+08			12826166	39136416	565510.3			4266380				
SQ00140	Prices	9281023					2580007							

	Stream													
SQ00141	Heathcote River	19766395						9220028						
SQ00165	School Creek	32229767						441.2242	202371.6					560914.2
SQ00168	Hurunui River	1.34E+09	1380757	1571248	6218985	64806226	3733748	111830.5	834811.3	2497302		138329.7	5115686	8689865
SQ00169	Pawsons Stream	2982692						717464.8		5726.497				
SQ00243	Pareora River	1.63E+08	124800.3		528520.7	246718.3	10433605		1074228	6496708			53023.83	3296251
SQ00268	Opihi River	1.74E+09	850289.8	498408.3	38112589	47962569	24769873	1901123	31649570	7208007	300020.4		1596676	28421228
SQ00284	Omarama Stream	2.81E+08			6283870	8903750	135420.3		1407581	39043862				
SQ00287	Quailburn	1.04E+08			1246645	2163937		23324.5	327335.5	10399605			103468.5	
SQ00288	Fork Stream	1.1E+08			3260042	41675257		76241.55	165521.4	7084786				
SQ00290	Maryburn	1.3E+08	61745.78						237886.1	9415035				
SQ00292	Wairepo Creek	14525619						167183.1		22942.9	10760949			
SQ00298	Waikakahi Stream	69671873	55907					418543	21590.35	208299.5				49590.29
SQ00373	Ealing Spring	3349547								42299.03				1332841
SQ00491	Aylmers Stream	3556827						433812.7	82965.85					305078.1
SQ00684	Balguerie Stream	4054220	5399.808					482338.3	74710.4					175336.5
SQ21045	Ohapi Creek	8885132							24491.5					
SQ26369	Irishman Creek	1.5E+08				1818561				352855.6	3394187		15750	
SQ30103	Pahau River	1.81E+08	16032.56		3441683	11470786	4981.356		2115463	35333.93				1130064
SQ30213	Taranaki	7140785						438586.4	65317.68					

	Creek													
SQ30976	Boggy Creek	21565057						2073.981						
SQ33270	Kowhai River	88705858			559401.1	18042390	22247090		2070337					376832.2
SQ33274	Lyell Creek	3207695					8550							
SQ33729	Dry Stream	49588421		18785.06					172254.1				730.6087	1847599
SQ33962	Waipara River	3.45E+08	399998.8	9145858			2151457		1065227				172360.3	7398184

Table 8.5.7.3 B: Canterbury Regional Council - Catchment land use data (14-26 of 37 categories).

SITE_ID	Hydrological Catchment Name	Grey Scrub	Herbaceous Freshwater Vegetation	High Producing Exotic Grassland	Indigenous Forest	Lake and Pond	Landslide	Low Producing Grassland	Major Shelterbelts	Manuka or Kanuka	Mata-gouri	Mixed Exotic Shrubland	Orchard and Other Perennial Crops	Other Exotic Forest
N/A	Okuti River			6439338	83984.05			565491.3	22455.32	662146.8				1228.587
N/A	Opuahau Stream	100139.8		35162723	267709.9			896274.2		2532934				738430.5
N/A	Takamatua Stream			7354437	20365.26					631339			9188.622	857459
SQ00017	Cust River		49097.98	1.55E+08	732283.5	19800		49340.11	217693.1	374064.3			322761.2	380973.2
SQ00018	Kaiapoi River	39523		2581626									39190.2	32728.12
SQ00035	Styx River			3208050									117364.4	30297.9
SQ00037	Ashley River	6409860	433383.9	2.65E+08	2.82E+08		448723.2	2.61E+08	1313336	50689231			1490979	9669417
SQ00063	Dudley Creek			3419923									174546.9	47897.82
SQ00102	Kaituna River			19897102	1680492			2218757		2870705				74753.3
SQ00103	Selwyn River - Coes Ford	832394.3	17860.5	4.05E+08	2554701.9	45750.89		93414117	1537764	4693586			323486.1	3031466
SQ00120	Ashburton River North	6139772	12802.87	11593192	1448273.7	60.94931	68259.3	52354370		730979.4	1676245			459437.6

	Branch													
SQ0012 8	Avon River			1075274		17385.2								149810.6
SQ0013 2	Bush Creek	80581.13			1667629	225749.3	17112.2 5	2027155			47.75655			
SQ0014 0	Prices Stream	310406.4		3623732	12563.64			2504642	14850	202895.1				31927.31
SQ0014 1	Heathcote River			5134048		54002.39			3857.048				675375.4	27034.72
SQ0016 5	School Creek			18034886				10625999		189868.1				168041.4
SQ0016 8	Hurunui River	2491153	1480107	70344548	4.39E+0 8	18676744	1560797	1.59E+08	427630	1.55E+08	1556888	302235.8		2917406
SQ0016 9	Pawsons Stream			2024300	7425			30070.8		169896.2				27809.09
SQ0024 3	Pareora River	1673731		94093117	169249.8			52590.2 9	106401.8	2509944				1005042
SQ0026 8	Opihi River	15703679	216393. 9	9.88E+08	2143234	6119377	309154. 5	1.68E+08	736632.3	4976427	7739784	2628616	68974.42	16219166
SQ0028 4	Omarama Stream	6533837	234316. 5	21199337	26100	55213.69		97863669	387950.6	97934.11	3055900	3358242		64594.33
SQ0028 7	Quailburn	1308730	2437743	6603610	398493.6	150747.4	51023.1	56968180	392350.7	139767	1531752	938927.5		2304408
SQ0028 8	Fork Stream		435755. 6			151782.7		22390536						135673.9
SQ0029 0	Maryburn	157097.1	878066. 9	18579874	43700.93	61634.08		74166462		178365.8	702789	1537256		204155.7
SQ0029 2	Wairepo Creek			2860327			17221.6 9	543616				147710.9		5668.421
SQ0029	Waikakahi	1335945	20968.7	64904669					287079.7		248275.6	83891.2		431995.3

8	Stream		2										
SQ0037 3	Ealing Spring			1814955				148244					
SQ0049 1	Aylmers Stream			2277199	47798.1			76143.37		14073.97			20599.32
SQ0068 4	Balguerie Stream			2038299	203040.8			275601.3		430544.8			97913.11
SQ2104 5	Ohapi Creek			7194821								3398.184	73519.84
SQ2636 9	Irishman Creek	461571.1	663517. 1	8918616		103162.7		65345441	464485.6		202031.9		94108.68
SQ3010 3	Pahau River			63570954	7044461	10136.9	32082.6 4	29940738	43612.01	35763127			27551.9
SQ3021 3	Taranaki Creek			4506909								144217.5	
SQ3097 6	Boggy Creek			19763190									
SQ3327 0	Kowhai River			12264910	2852999		28596.9 9	467817.6	10090.08	13830958			959153
SQ3327 4	Lyell Creek			3105010					5591.136			46284.7	
SQ3372 9	Dry Stream			29340474	1238705			7070732	75460.09	4498005	411782.1		358303.1
SQ3396 2	Waipara River		42389.3 9	79683120	1039287 7	51489.67	13216.8 1	1.8E+08	239756.3	15342917	605089.2		8131147

Table 8.5.7.3 C: Canterbury Regional Council Catchment land use data (27-37 of 37 categories).

SITE_ID	Hydrological Catchment Name	Permanent Snow and Ice	Pine Forest - Closed Canopy	Pine Forest - Open Canopy	River	River and Lakeshore Gravel and Rock	Short-rotation Cropland	Sub Alpine Shrubland	Surface Mine	Tall Tussock Grassland	Transport Infrastructure	Urban Parkland/Open Space	Vineyard
N/A	Okuti River		62708.65	203015									
N/A	Opuahau Stream		227399.5	1395792									
N/A	Takamatua Stream			13851.31						74182.75			316627.3
SQ00017	Cust River		1045760	307927.3			36797393					135083	
SQ00018	Kaipoi River		17062.42				3042009						
SQ00035	Styx River						394140						
SQ00037	Ashley River		42774133	8937512	3056717	13902531	24726570	18904575	135284.4	78814362		585922.4	
SQ00063	Dudley Creek						637149.9					1025571	
SQ00102	Kaituna River		636148.2	97890.79									
SQ00103	Selwyn River - Coes Ford		39342865	28026129		4302526	62890361	2975434	122848.3	8039521	13741.56	449446.4	1547.699
SQ00120	Ashburton River North Branch		866709.3	348427	478531.8	2233493		5660652		1.09E+08			
SQ00128	Avon River		34597.92		72243.78		403127.2					3443374	
SQ00132	Bush Creek					362780.5		935551.3		78072826			
SQ00140	Prices Stream												
SQ00141	Heathcote River						852564.7					3799485	
SQ00165	School Creek		172743	21523.97			2061580					191399.2	
SQ00168	Hurunui River		24678690	9214193	4381852	12454380	13541912	44999777	20136.87	2.78E+08	302365.1	194167.9	
SQ00169	Pawsons Stream												
SQ00243	Pareora River		1115082	2069740		1138670		526885		36446358			
SQ00268	Opihi River		12521689	14986774	1400965	15276717	67751528	10643243	166892.2	2.23E+08	106419.5	687934.8	102372
SQ00284	Omarama Stream		175719				10113805	25922.96	6773.76	81780282			
SQ00287	Quailburn		87297.65				1319530			15135315			
SQ00288	Fork Stream	325531.5			114500.8	3133382		1282136		29821351			

SQ00290	Maryburn		110954.4		491678.2		193208			22697470			
SQ00292	Wairepo Creek												
SQ00298	Waikakahi Stream		475826.8	540772.2			588520						
SQ00373	Ealing Spring					11207.54							
SQ00491	Aylmers Stream		298418							738.8814			
SQ00684	Balguerie Stream		119952.2	72590.86			55574.01			9865.538		13053.09	
SQ21045	Ohapi Creek						1588902						
SQ26369	Irishman Creek				164980					67912609			
SQ30103	Pahau River		12161.5			1936305	8131771	2312912		14145549			
SQ30213	Taranaki Creek		158113.2	114968.8			1367887					344785	
SQ30976	Boggy Creek		35292.64				1764500						
SQ33270	Kowhai River		113159.2	210843.2		2135993		8011153		4378549		145585.3	
SQ33274	Lyell Creek						39630.68						2628.36
SQ33729	Dry Stream		63598.85	261407.8			3907907		30343.5		292334.9		
SQ33962	Waipara River		16124789	2010788		536853.7	11300895						

8.5.7.4 Canterbury Regional Council: Macroinvertebrate data from the 2009 sampling round.

Appendix 8.5.7.4 A: Canterbury Regional Council macro invertebrate data 2009 sampling round (1-10 of 44 samples).

Site_ID	SQ00017	SQ00018	SQ00035	SQ00036	SQ00037	SQ00063	SQ00102	SQ00103	SQ00120	SQ00128
Sample_no	300455	300456	300466	300467	300468	300479	300482	300483	300490	300496
Date_collect	20-Nov-08	20-Nov-08	06-Jan-09	21-Nov-08	20-Nov-08	20-Nov-08	26-Nov-08	19-Nov-08	05-Dec-08	18-Nov-08
Acarina								2	1	5
Acroperla										
Ameletopsis										
Amphipoda										
Anisops										
Antiporus										
Aoteapsyche		12	3				1		8	1
Aphrophila										1
Archichauliodes							1			
Atalophlebioides										
Austroclima							6			
Austrolestes										
Austropeplea										
Austroperla										
Austrosimulium				1		1		3	1	
Beraeoptera									4	
Berosus										
Berosus adult										

Ceratopogonidae										
Chironominae	10		1		32	4		3	1	1
Cladocera										
Coloburiscus										
Confluens										
Copepod	2				1	1				
Costachorema										
Culicidae										
Deleatidium	14	65	28	62	59		20	4	40	
Diamesinae								7		
Edpercivalia										
Elmidae	1	2	1	3			1			1
Elmidae Adult				1						
Empididae										3
Ephydriidae										
Eriopterini									3	
Ferissia Adult										
Gyraulus										
Helicopsyche							2			
Hemicordulia										
Hexatomini									1	
Hirudinea										
Hudsonema	2		1							1
Huxelhydrus										
Hydra										

Hydraenidae										
Hydraenidae Adult							1			
Hydrobiosella										
Hydrobiosis		3	3	5	2		3	1	2	
Hydrochorema										
Hydrophilidae										
Hygraula										
Ichthybotus										
Isopoda										
Lancetes										
Limoniinae										
Liodessus										
Liodessus adult										
Lymnaea										
Megaleptoperla									1	
Microvelia										
Mischoderus										
Molophilus										
Muscidae										
Nannochoristidae										
Nematoda						1		1		
Neocurupira							2			
Neozephlebia							2			
Nesameletus							1			
Neurochorema										

Nothodixa										
Oecetis										
Oeconesus										
Oligochaeta	32	4	32	2	10	74		40	1	32
Olinga	4	4		1			24	1	2	
Oniscigaster										
Orchymontia										
Orthoclaadiinae	6	1	1		1		2	45	1	4
Ostracoda	17	1				1		5		
Oxyethira	2							5		
Paracalliope	4	2	8			17		3		47
Paradixa										
Paraleptamphopus										
Paralimnophila										
Paranephrops										
Paratya curvirostris (shrimp)										
Paroxyethira										
Philorheithrus										
Phreatogammarus										5
Physsa	1	1								
Pisidium/Sphaerium						4				
Platyhelminthes		2	5				1	1		
Plectrocnemia					1					
Podonominae							1			

Polyplectropis										
Potamopyrgus	1	1	2				3			14
Psilochorema		1		1			1		1	
Psychodidae										
Ptilodactylidae										
Pycnocentria	2	7	15					1		4
Pycnocentrodes	16	1	25	25			31		32	1
Rallidens										
Scirtidae										
Sigara										
Stenoperla										
Stratiomyidae										
Tabanidae										
Tanyderidae						2				
Tanypodinae	3			2	1			1		1
Tipulidae										
Triplectides										
Xanthocnemis										
Zelandobius										
Zelandoperla										
Zelandopsyche										
Zelandotipula										
Zelolessica										
Zephlebia							1			
MCI score	90.0	97.3	87.7	112.0	87.5	62.2	132.6	81.3	109.3	88.0

Appendix 8.5.7.4 B: Canterbury Regional Council macro invertebrate data 2009 sampling round (11-20 of 44 samples).

Site_ID	SQ00130	SQ00132	SQ00140	SQ00141	SQ00142	SQ00165	SQ00168	SQ00169	SQ00208	SQ00214
Sample_no	300498	300499	300505	300622	300506	300519	300522	300523	300535	300536
Date_collect	03-Dec-08	26-Nov-08	26-Nov-08	15-Jan-09	21-Nov-08	02-Dec-08	24-Nov-08	25-Nov-08	19-Dec-08	17-Dec-08
Acarina	1					1			3	
Acropera										
Ameletopsis										
Amphipoda										
Anisops										
Antiporus										
Aoteapsyche							1			
Aphrophila										
Archichauliodes					1		2	1	1	
Atalophlebioides										
Austroclima										
Austrolestes										
Austropeplea										
Austroperla										
Austrosimulium		2	2				3	23		
Beraeoptera										
Berosus										
Berosus adult										
Ceratopogonidae										
Chironominae		18	1	3	2	5	2			1

Cladocera										25
Coloburiscus					3		1	1		
Confluens										
Copepod					1	2				
Costachorema		1			1					
Culicidae										
Deleatidium		2	13		19	1	62	14	5	
Diamesinae			7	1		1		3		
Edpercivalia										
Elmidae		1			14	1	7		1	
Elmidae Adult		5								
Empididae		2								
Ephydridae						2			1	
Eriopterini	1	3					1		3	
Ferissia Adult										
Gyraulus						4				
Helicopsyche									4	
Hemicordulia										
Hexatomini										
Hirudinea										
Hudsonema			4							
Huxelhydrus										
Hydra										
Hydraenidae										
Hydraenidae Adult								1	1	

Hydrobiosella									
Hydrobiosis		3	5		2	1	2	3	
Hydrochorema									
Hydrophilidae									3
Hygraula									1
Ichthybotus									
Isopoda									
Lancetes									
Limoniinae									
Liodessus						3			
Liodessus adult						1			
Lymnaea									
Megaleptoperla									
Microvelia		1							
Mischoderus									
Molophilus									
Muscidae		5							
Nannochoristidae									
Nematoda					1			1	3
Neocurupira									
Neozephlebia			1						
Nesameletus									
Neurochorema			1						
Nothodixa								1	
Oecetis									

Oeconesus										
Oligochaeta	45	4	7	66	8	57	9	15	21	67
Olinga		2	1		34		6	2	3	
Oniscigaster		1								
Orchymontia										
Orthocladinae		1	25	8	6	19	1	27	19	2
Ostracoda	7		4	19			1	4		5
Oxyethira	1	4	1	12		6				1
Paracalliope	40		4					1	1	
Paradixa										
Paraleptamphopus										
Paralimnophila										
Paranephrops										
Paratya curvirostris (shrimp)										
Paroxyethira								1		
Philorheithrus										
Phreatogammarus										
Physa	8			4		1				
Pisidium/Sphaerium	4			6						5
Platyhelminthes										
Plectrocnemia										
Podonominae		3							1	
Polyploctropis										
Potamopyrgus	32		19	1		3	1	1	8	6

Psilochorema			2		1		2	3		
Psychodidae										
Ptilodactylidae										
Pycnocentria			3		8			2		
Pycnocentrodes		6	5		4		4	3	16	
Rallidens										
Scirtidae										
Sigara										16
Stenoperla					2		1		2	
Stratiomyidae										
Tabanidae									1	
Tanyderidae		5	3		1	1				
Tanypodinae								3		
Tipulidae										
Triplectides										
Xanthocnemis										
Zelandobius		16								
Zelandoperla										
Zelandopsyche										
Zelandotipula										
Zelolessica										
Zephlebia										
MCI score	77.8	104.0	93.7	48.9	114.1	77.6	110.6	101.0	116.0	57.8

Appendix 8.5.7.4 C: Canterbury Regional Council macro invertebrate data 2009 sampling round (21-30 of 44 samples).

Site_ID	SQ00243	SQ00257	SQ00258	SQ00263	SQ00268	SQ00284	SQ00287	SQ00288	SQ00290	SQ00292
Sample_no	301092	300555	300556	300559	300563	300571	300573	300574	300576	300578
Date_collect	08-Dec-09	19-Dec-08	19-Dec-08	16-Dec-08	17-Dec-08	18-Dec-08	12-Dec-08	19-Nov-08	19-Dec-08	19-Dec-08
Acarina										1
Acroperla										
Ameletopsis										
Amphipoda										
Anisops										
Antiporus										
Aoteapsyche		3			3	2		1	6	
Aphrophila						1				
Archichauliodes		2	1						1	
Atalophlebioides										
Austroclima										
Austrolestes										
Austropeplea										
Austroperla										
Austrosimulium			2			1			6	
Beraeoptera										
Berosus										
Berosus adult	1									
Ceratopogonidae										
Chironominae	27		3	1	1	1		1		

Cladocera										
Coloburiscus		2								
Confluens										
Copepod										
Costachorema										
Culicidae				2						
Deleatidium	57	34	35	6	16	3	4	28	30	8
Diamesinae										
Edpercivalia										
Elmidae	13	1	10		3	12	9	1	2	
Elmidae Adult	5					1	1			
Empididae							1			
Ephydridae										
Eriopterini										
Ferissia Adult										
Gyraulus					1					
Helicopsyche			1							
Hemicordulia										
Hexatomini										
Hirudinea										
Hudsonema	1			1			2			
Huxelhydrus										
Hydra										
Hydraenidae										
Hydraenidae Adult										

Hydrobiosella										
Hydrobiosis	1					1	1	1	3	1
Hydrochorema										
Hydrophilidae										
Hygraula										
Ichthybotus										
Isopoda										
Lancetes										
Limoniinae										
Liodessus										
Liodessus adult										
Lymnaea										
Megaleptoperla										
Microvelia										
Mischoderus										
Molophilus										
Muscidae						1				
Nannochoristidae										
Nematoda		1				1			3	1
Neocurupira										
Neozephlebia		2								
Nesameletus										
Neurochorema						2				
Nothodixa										
Oecetis										

Oeconesus										
Oligochaeta	1	36	24		1	12	71	1	13	6
Olinga	2		7		13	3			10	1
Oniscigaster										
Orchymontia										
Orthoclaadiinae	1		2	7	1			1	3	1
Ostracoda	1	1			1		1			2
Oxyethira	3		8	2		1				1
Paracalliope		12		79			4		4	
Paradixa										
Paraleptamphopus										
Paralimnophila										
Paranephrops										
Paratya curvirostris (shrimp)										
Paroxyethira										
Philorheithrus										
Phreatogammarus										
Phylla						1				
Pisidium/Sphaerium						3	1			
Platyhelminthes									1	
Plectrocnemia										
Podonominae	1					1				
Polyploctropis		1		1						1
Potamopyrgus		5	2	8	1	25			5	62

Psilochorema	1		7			1	1	1		
Psychodidae										
Ptilodactylidae										
Pycnocentria		2			1	21			1	1
Pycnocentrodes	1	8	2	3	70	12	8	1	13	16
Rallidens										
Scirtidae										
Sigara										
Stenoperla			1							
Stratiomyidae										
Tabanidae										
Tanyderidae										
Tanypodinae										
Tipulidae										
Triplectides										
Xanthocnemis										
Zelandobius										
Zelandoperla										
Zelandopsyche										
Zelandotipula										
Zelolessica										
Zephlebia										
MCI score	100.0	110.0	108.6	88.3	95.2	101.7	88.9	96.0	95.4	86.3

Appendix 8.5.7.4 D: Canterbury Regional Council macro invertebrate data 2009 sampling round (31-40 of 44 samples).

Site_ID	SQ00294	SQ00298	SQ00373	SQ00491	SQ00684	SQ21045	SQ26369	SQ30103	SQ30213	SQ30976
Sample_no	300579	300582	301124	300601	300605	300543	300575	300520	300459	300593
Date_collect	17-Dec-08	17-Dec-08	07-Dec-09	25-Nov-08	25-Nov-08	16-Dec-08	19-Dec-08	02-Dec-08	20-Nov-08	19-Nov-08
Acarina				1			1			1
Acroperla				2						
Ameletopsis										
Amphipoda										
Anisops										
Antiporus										
Aoteapsyche	1				1	30		1		
Aphrophila				1						
Archichauliodes				3	4					
Atalophlebioides										
Austroclima										
Austrolestes										
Austropeplea										
Austroperla										
Austrosimulium						2	21	7		1
Beraeoptera										
Berosus			1							
Berosus adult										
Ceratopogonidae		1								
Chironominae	33		1					4		2

Cladocera										
Coloburiscus				5	2					
Confluens										
Copepod										1
Costachorema			1				1			
Culicidae										
Deleatidium		7	5	31	40	2	3	70		
Diamesinae				2		3	1			
Edpercivalia										
Elmidae	5		6			2	16	21		3
Elmidae Adult								1		1
Empididae										
Ephydridae										
Eriopterini			2					2		
Ferissia Adult										
Gyraulus										
Helicopsyche		10			1	2	1			
Hemicordulia										
Hexatomini										
Hirudinea										
Hudsonema			1							1
Huxelhydrus										
Hydra										
Hydraenidae										
Hydraenidae Adult				5	4					

Hydrobiosella				1				1	
Hydrobiosis	1		1	1	2	3		5	
Hydrochorema									
Hydrophilidae									
Hygraula							1		1
Ichthybotus									
Isopoda									
Lancetes									
Limoniinae									
Liodessus									
Liodessus adult									
Lymnaea									
Megaleptoperla									
Microvelia									
Mischoderus									
Molophilus									
Muscidae									
Nannochoristidae									
Nematoda	6	2							1 6
Neocurupira				3					
Neozephlebia				9	6				
Nesameletus				3	7				
Neurochorema							1		
Nothodixa									
Oecetis		1							

Oeconesus										
Oligochaeta	45	30	2	6	3	42	40	2	36	83
Olinga	4		1	7	4					
Oniscigaster										
Orchymontia										
Orthocladiinae	10		4	13	3	4	2	3	2	3
Ostracoda	1	7	3					3	10	5
Oxyethira	2						3		1	
Paracalliope		16				3	3		33	
Paradixa										
Paraleptamphopus										
Paralimnophila										
Paranephrops										
Paratya curvirostris (shrimp)										
Paroxyethira										
Philorheithrus										
Phreatogammarus										
Phylla		7				1			2	1
Pisidium/Sphaerium	2	2							3	
Platyhelminthes				1	3					
Plectrocnemia										
Podonominae										
Polyploctropis	1				1					
Potamopyrgus	29	14	57	1	1	1	3		17	1

Psilochorema	2					3	1	1	1	
Psychodidae										
Ptilodactylidae										
Pycnocentria		1	7			3	2	2		2
Pycnocentrodes	4	2	12		8		12	11		
Rallidens										
Scirtidae										
Sigara										
Stenoperla					1					
Stratiomyidae										
Tabanidae										
Tanyderidae										
Tanypodinae	1			6	10			2		
Tipulidae										
Triplectides					1				1	
Xanthocnemis										
Zelandobius										
Zelandoperla										
Zelandopsyche										
Zelandotipula										
Zelolessica										
Zephlebia										
MCI score	90.8	104.0	116.8	125.3	88.0	98.6	101.2	102.5	71.7	78.6

Appendix 8.5.7.4 E: Canterbury Regional Council macro invertebrate data 2009 sampling round (41-44 of 50 samples).

Site_ID	SQ33270	SQ33274	sq33729	SQ33962
Sample_no	300473	301162	300521	300463
Date_collect	01-Dec-08	15-Dec-09	02-Dec-08	24-Nov-08
Acarina		1		
Acroperla				
Ameletopsis		1		
Amphipoda				
Anisops		2		
Antiporus				
Aoteapsyche				
Aphrophila				
Archichauliodes		1		1
Atalophlebioides				
Austroclima				
Austrolestes		1		
Austropeplea				
Austroperla				
Austrosimulium	12		3	
Beraeoptera				
Berosus				
Berosus adult				
Ceratopogonidae				
Chironominae	1		7	57
Cladocera				
Coloburiscus				
Confluens				
Copepod				
Costachorema		4		
Culicidae				
Deleatidium	45	1	3	19
Diamesinae	6	1		
Edpercivalia		1		
Elmidae	1	1	40	
Elmidae Adult	1		7	
Empididae				

Ephydridae	1	97		
Eriopterini	9	1		
Ferissia Adult		1		
Gyraulius		4	3	
Helicopsyche				
Hemicordulia				
Hexatomini				
Hirudinea				
Hudsonema				15
Huxelhydrus				
Hydra				
Hydraenidae				
Hydraenidae Adult				
Hydrobiosella				
Hydrobiosis	19		1	2
Hydrochorema	1			
Hydrophilidae				
Hygraula				
Ichthybotus				
Isopoda				
Lancetes				
Limoniinae				
Liodessus				
Liodessus adult				
Lymnaea				
Megaleptoperla				
Microvelia				
Mischoderus				
Molophilus				
Muscidae	1		2	2
Nannochoristidae				
Nematoda				
Neocurupira				
Neozephebia				
Nesameletus				

Neurochorema				
Nothodixa				
Oecetis				
Oeconesus				
Oligochaeta	3		30	
Olinga				3
Oniscigaster				
Orchymontia				
Orthoclaadiinae	5		10	
Ostracoda				
Oxyethira	3		2	2
Paracalliope			1	
Paradixa				
Paraleptamphopus				
Paralimnophila				
Paranephrops				
Paratya curvirostris (shrimp)				
Paroxyethira				
Philorheithrus				
Phreatogammarus				
Physa			1	
Pisidium/Sphaerium				
Platyhelminthes				
Plectrocnemia				
Podonominae				
Polyplectropis				
Potamopyrgus			1	
Psilochorema				1
Psychodidae				
Ptilodactylidae				
Pycnocentria				
Pycnocentroides				
Rallidens				
Scirtidae				
Sigara				

Stenoperla				
Stratiomyidae				
Tabanidae				
Tanyderidae				
Tanypodinae	3			2
Tipulidae				
Triplectides				
Xanthocnemis				
Zelandobius				
Zelandoperla				
Zelandopsyche				
Zelandotipula				
Zelolessica				
Zephlebia				
MCI score	89.3	90.0	74.3	108.0

8.5.7.5 Canterbury Regional Council: Water quality data

Table 8.5.7.5: Canterbury Regional Council: Water quality data for stream sites as obtained from the council database (1-6 of 11 variables).

Site_ID	Source	Description	Time	Easting	Northing	Water Temperature °C	Dissolved Oxygen mg/L O2	Dissolved Oxygen Saturation %	pH CHEM	Ammonia Nitrogen mg/L N	Nitrate + Nitrite Nitrogen mg/L N
SQ10005	Omarama	Omarama	1254	2268079	5630925	11.7	7.9	74.8	6.7	0.012	0.19
SQ10005	Omarama	Omarama	1334	2268079	5630925	15	10.29	102.1	6.9	0.0025	0.12
SQ10005	Omarama	Omarama	1256	2268079	5630925	9.1	10.95	94.8	7.3	0.008	0.12
SQ10005	Omarama	Omarama	1345	2268079	5630925	5.7	11.7	93.3	7.3	0.014	0.45
SQ10206	SPRING CREEK	SH8	1047	2272594	5647848	9	8.5	73.9	6.8	0.011	0.11
SQ10206	SPRING CREEK	SH8	1107	2272594	5647848	13.1	9.8	93.4	7	0.005	0.0025
SQ10206	SPRING CREEK	SH8	1152	2272594	5647848				7.6	0.016	0.035
SQ10206	SPRING CREEK	SH8	1059	2272594	5647848	7.5	11.22	93.5	7.6	0.012	0.17
SQ10275	Maryburn	SH8	1004	2295987	5666858	11.5	8.7	81.8	6.8	0.01	0.033

SQ10275	Maryburn	SH8	1113	2295987	5666858	16	10.09	102.2	7	0.0025	0.0025
SQ10275	Maryburn	SH8	1009	2295987	5666858	6.8	11.79	96.6	7.5	0.01	0.027
SQ10275	Maryburn	SH8	1020	2295987	5666858	0.5	14.52	100.5	7.4	0.012	0.037
SQ10823	Quailburn	Henburn	1253	2265526	5635403	17.4	9.58	100	6.8	0.014	0.0025
SQ10823	Quailburn	Henburn	1215	2265526	5635403	7.9	11.84	99.8	7.6	0.005	0.0025
SQ10823	Quailburn	Henburn	1227	2265526	5635403	1.5	15.43	110.4	7.6	0.011	0.0025
SQ10823	Quailburn	Henburn	1238	2265526	5635403	10.6	11.95	107.3	7.7	0.0025	0.008
SQ20243	OPIHI RIVER	SH1	925	2371968	5659006	15.2	9.68	95.8	6.8	0.009	0.18
SQ20243	OPIHI RIVER	SH1	1009	2371968	5659006	9.9	10.16	96.7	7.2	0.012	0.39
SQ20243	OPIHI RIVER	SH1	905	2371968	5659006	9	11.45	98.9	7.5	0.015	0.98
SQ20243	OPIHI RIVER	SH1	948	2371968	5659006	6.1	11.42	91.9	7.3	0.13	0.61
SQ21045	Ohapi Creek	Guild Rd	1313	2376290	5664470	9.7	9.5	83.8	6.9	0.012	0.42
SQ21045	Ohapi Creek	Guild Rd	1252	2376290	5664470	13.3	10.43	99.5	7.1	0.008	0.15
SQ21045	Ohapi Creek	Guild Rd	1340	2376290	5664470	10	11.16	105.9	7.7	0.009	0.23
SQ21045	Ohapi Creek	Guild Rd	1312	2376290	5664470	8.3	12.29	104.3	7.7	0.006	0.54
SQ21162	Waikakahi	Glenavy	1024	2357991	5586803	13	8.5	80.5	7	0.028	1.7
SQ21162	Waikakahi	Glenavy	1129	2357991	5586803	15.3	8.41	84	7.2	0.029	1.2

SQ21162	Waikakahi	Glenavy	1013	2357991	5586803	13.8	9.83	95	7.4	0.017	1.7
SQ21162	Waikakahi	Glenavy	1027	2357991	5586803	10.8	13.08	118.2	8	0.015	2
SQ21162	Waikakahi	Glenavy	1047	2357991	5586803	7.5	13.06	109.3	8	0.005	3.9
SQ21162	Waikakahi	Glenavy	1102	2357991	5586803	4.5	14.24	110.1	8.1	0.071	4.2
SQ26369	Irishman Creek	SH8	946	2297713	5676644	11	8.3	76.9	6.5	0.015	0.0025
SQ26369	Irishman Creek	SH8	1055	2297713	5676644	14.1	9.54	92.6	6.6	0.005	0.0025
SQ26369	Irishman Creek	SH8	958	2297713	5676644	5.9	12.51	100	7.2	0.0025	0.0025
SQ26369	Irishman Creek	SH8	1004	2297713	5676644	0.7	14.16	98.9	7.1	0.015	0.0025
SQ30103	Pahau R	at SH7	1105	2496025	5823331	8.1	11.4	96.7	6.6	0.03	0.49
SQ30103	Pahau R	at SH7	1110	2496025	5823331	12.3	10.6	99.4	6.8	0.016	0.99
SQ30103	Pahau R	at SH7	1325	2496025	5823331	16.8	10.1	103.9	7	0.012	1.3
SQ30103	Pahau R	at SH7	1120	2496025	5823331	17.2	9.5	98.7	7.2	0.031	1.7
SQ30103	Pahau R	at SH7	1000	2496025	5823331	16.9	9.4	96.9	7.2	0.013	1.3
SQ30103	Pahau R	at SH7	1015	2496025	5823331	13.9	10.1	97.7	7.4	0.0025	0.58
SQ30103	Pahau R	at SH7	1015	2496025	5823331	15.3	9.9	98.5	7.7	0.008	0.44
SQ30103	Pahau R	at SH7	1030	2496025	5823331	10.7	11.8	106.2	7.5	0.007	0.17
SQ30103	Pahau R	at SH7	1105	2496025	5823331	8	11.9	100.3	7.7	0.015	0.27

SQ30103	Pahau R	at SH7	1115	2496025	5823331	6.9	11.8	97.1	7.7	0.016	0.26
SQ30103	Pahau R	at SH7	1110	2496025	5823331	6.6	12.6	102.8	7.7	0.014	0.36
SQ30103	Pahau R	at SH7	1145	2496025	5823331	5.7	12.4	98.6	7.7	0.12	0.063
SQ30175	Ashley R	at SH1	1211	2484800	5770000	8.8	10.6	93.1	7.3	0.016	0.35
SQ30175	Ashley R	at SH1	920	2484800	5770000	17.3	9.9	103	7.6	0.01	0.13
SQ30175	Ashley R	at SH1	920	2484800	5770000	15.2	10.2	101.5	7.6	0.01	0.16
SQ30175	Ashley R	at SH1	1015	2484800	5770000	7.4	12.1	101.1	7.4	0.0025	0.18
SQ30184	Ashley R	at Gorge	911	2447345	5775206	7.5	12.6	105	7	0.015	0.29
SQ30184	Ashley R	at Gorge	1030	2447345	5775206	17.9	10.1	106.5	7.6	0.0025	0.012
SQ30184	Ashley R	at Gorge	1030	2447345	5775206	15.3	11	109.5	7.9	0.01	0.12
SQ30184	Ashley R	at Gorge	1100	2447345	5775206	5.3	12.9	102.2	7.5	0.006	0.11
SQ30400	Cust R	at	1135	2479939	5759498	8.8	11.7	100.8	7.4	0.028	4
SQ30400	Cust R	at	1150	2479939	5759498	17.2	9.9	103.1	7.6	0.009	3.7
SQ30400	Cust R	at	1100	2479939	5759498	14.9	10.6	104.5	7.8	0.055	4.3
SQ30400	Cust R	at	1150	2479939	5759498	11.1	11.1	100.6	7.6	0.022	5.4
SQ30916	Selwyn R	at Coes	1245	2462681	5723316	13.7	10.1	96.9	7.7	0.008	5.1
SQ30916	Selwyn R	at Coes	1225	2462681	5723316	13.8	11.2	108.4	7.5	0.0025	4.5

SQ30916	Selwyn R	at Coes	1130	2462681	5723316	16.9	9.5	97.9	7.4	0.0025	4.4
SQ30916	Selwyn R	at Coes	1150	2462681	5723316	17.7	9.1	95	7.6	0.01	4.1
SQ30916	Selwyn R	at Coes	922	2462681	5723316	15.7	9.6	95.5	7.5	0.012	4.4
SQ30916	Selwyn R	at Coes	1050	2462681	5723316	16.4	9.5	97.4	7.5	0.008	4.6
SQ30916	Selwyn R	at Coes	1250	2462681	5723316	14.5	9.8	96.1	7.6	0.017	3.5
SQ30916	Selwyn R	at Coes	1120	2462681	5723316	12.1	10.7	99.6	7.6	0.0025	5
SQ30916	Selwyn R	at Coes	1240	2462681	5723316	12.2	10.9	101.2	7.7	0.0025	4.4
SQ30916	Selwyn R	at Coes	1102	2462681	5723316	7.5	11.1	92.2	7.6	0.009	5.2
SQ30916	Selwyn R	at Coes	1240	2462681	5723316	7.9	11.9	99.8	7.4	0.005	2.3
SQ30916	Selwyn R	at Coes	1016	2462681	5723316	7.2	11	90.5	7.5	0.009	4.6
SQ30928	Selwyn R	at	1155	2420428	5748976	10.6	10.6	95.4	6.7	0.011	0.18
SQ30928	Selwyn R	at	1100	2420428	5748976	13.7	9.7	93.3	7	0.008	0.16
SQ30928	Selwyn R	at	1040	2420428	5748976	11.2	11.2	102.1	7.6	0.019	0.2
SQ30928	Selwyn R	at	1200	2420428	5748976	8.3	12	102.5	7.7	0.0025	0.29
SQ30976	Boggy Ck	at Lake	1205	2458304	5715571	14.1	10.1	98	7.7	0.029	6.6
SQ30976	Boggy Ck	at Lake	1150	2458304	5715571	12	10.9	101.2	7.2	0.006	5.4
SQ30976	Boggy Ck	at Lake	1040	2458304	5715571	15.6	9.2	92.7	7.2	0.014	5.2

SQ30976	Boggy Ck	at Lake	1055	2458304	5715571	16.5	9.7	99.6	7.6	0.014	3.3
SQ30976	Boggy Ck	at Lake	857	2458304	5715571	13.8	3.4	30.9	7.2	0.01	0.0025
SQ30976	Boggy Ck	at Lake	1000	2458304	5715571	15.2	11.6	115.5	8	0.009	6.8
SQ30976	Boggy Ck	at Lake	1150	2458304	5715571	14	10.6	103.7	7.9	0.032	7.1
SQ30976	Boggy Ck	at Lake	1040	2458304	5715571	10.9	12.1	109.3	8	0.009	1.7
SQ30976	Boggy Ck	at Lake	1200	2458304	5715571	11.1	12.2	111.1	8.1	0.0025	6.1
SQ30976	Boggy Ck	at Lake	1030	2458304	5715571	9.2	4	35.3	7.2	0.033	0.091
SQ30976	Boggy Ck	at Lake	1140	2458304	5715571	7.7	12.8	107.2	7.7	0.015	6.8
SQ30976	Boggy Ck	at Lake	947	2458304	5715571	9.1	3.4	30.4	7.1	0.008	0.36
SQ33274	Lyell Creek	at Mills	1610	2565900	5869865	13.1	9.5	90.7	7.3	0.029	0.97
SQ33274	Lyell Creek	at Mills	820	2565900	5869865	13.6	9.6	91.7	7.5	0.014	0.97
SQ33274	Lyell Creek	at Mills	1645	2565900	5869865	12.7	10.3	97.6	7.6	0.031	1.5
SQ33274	Lyell Creek	at Mills	1540	2565900	5869865	10.1	10.8	96.3	7.7	0.032	1.6
SQ33729	DRY STREAM	Above	945	2494966	5821496	7.4	11.2	93.2	7.1	0.09	1.7
SQ33729	DRY STREAM	Above	930	2494966	5821496	9.7	12.1	106.1	6.8	0.021	0.015
SQ33729	DRY STREAM	Above	1150	2494966	5821496	13.9	13.4	129.5	7.5	0.008	0.24
SQ33729	DRY STREAM	Above	910	2494966	5821496	16.6	10.1	104.4	7.2	0.014	0.039

SQ33729	DRY STREAM	Above	825	2494966	5821496	17.3	10.6	110.5	7.3	0.0025	0.005
SQ33729	DRY STREAM	Above	930	2494966	5821496	12.7	12	113.7	7.3	0.008	0.33
SQ33729	DRY STREAM	Above	830	2494966	5821496	12	11.7	108.6	7.6	0.012	0.02
SQ33729	DRY STREAM	Above	835	2494966	5821496	9.2	12.1	105.1	7.9	0.019	0.12
SQ33729	DRY STREAM	Above	920	2494966	5821496	6.9	12.1	99.8	7.7	0.017	0.066
SQ33729	DRY STREAM	Above	945	2494966	5821496	3.9	12.6	96.1	7.7	0.046	0.64
SQ33729	DRY STREAM	Above	935	2494966	5821496	6.2	12.2	98.1	7.8	0.019	1.3
SQ33962	Waipara River	at	1044	2476590	5794100	7.9	12.2	103	7.6	0.013	0.95
SQ33962	Waipara River	at	1210	2476590	5794100	20.2	12.2	134.7	8.2	0.008	0.0025
SQ33962	Waipara River	at	1145	2476590	5794100	20.7	9.9	110.3	8.3	0.014	0.022
SQ33962	Waipara River	at	1215	2476590	5794100	7.5	13.2	110.9	7.8	0.01	0.067
SQ34191	Taranaki Creek	Preeces	1150	2484760	5766912	10.4	10.4	92.7	6.9	0.018	0.54
SQ34191	Taranaki Creek	Preeces	1115	2484760	5766912	15.3	10.3	103	7.2	0.018	0.44
SQ34191	Taranaki Creek	Preeces	1030	2484760	5766912	11.8	10.4	95.8	7.7	0.018	0.4
SQ34191	Taranaki Creek	Preeces	1155	2484760	5766912	8.6	11.3	96.7	7.7	0.019	0.88
SQ35235	Pawsons Stream	Above	1123	2504633	5718551	14.1	9.7	94.5	7.8	0.006	0.025
SQ35235	Pawsons Stream	Above	1039	2504633	5718551	10.8	11.1	100.4	8	0.46	0.31

SQ35235	Pawsons Stream	Above	1107	2504633	5718551	12			7.9	0.03	0.33
SQ35235	Pawsons Stream	Above	817	2504633	5718551	5	12.3	96.3	7.6	0.015	0.43
SQ26931	Bush Stream		1150	2338801	5729568	10.4	7.5	85.3	6.6	0.015	0.012
SQ26931	Bush Stream		922	2338801	5729568	13.9	10.35	100.3	6.7	0.0025	0.014
SQ26931	Bush Stream		958	2338801	5729568	10.4	11.08	99.2	6.8	0.007	0.025
SQ26931	Bush Stream		1201	2338801	5729568	6.9	11.85	97.4	7.4	0.0025	0.01
SQ26931	Bush Stream		1202	2338801	5729568	3.3	13.87	103.8	7.5	0.013	0.008
SQ26931	Bush Stream		1144	2338801	5729568	2.2	15.07	109.2	7.4	0.017	0.052
SQ30707	Aylmers Valley		1308	2506916	5710792	14	10.2	96.8	7.5	0.005	0.084
SQ30707	Aylmers Valley		1138	2506916	5710792	10.8	11	99.8	7.6	0.009	0.23
SQ30707	Aylmers Valley		1145	2506916	5710792	12			7.7	0.016	0.42
SQ30707	Aylmers Valley		859	2506916	5710792	6	11.7	92.6	7.5	0.007	0.53
SQ30782	Kaituna Stm at		1405	2484432	5716740	14.3	10	97.1	7.8	0.016	0.043
SQ30782	Kaituna Stm at		1350	2484432	5716740	11.8	11.1	102.6	7.1	0.019	0.021
SQ30782	Kaituna Stm at		1240	2484432	5716740	15.7	10	101.1	7.1	0.014	0.02
SQ30782	Kaituna Stm at		1300	2484432	5716740	16.9	11.5	118.5	7.4	0.007	0.0025
SQ30782	Kaituna Stm at		1049	2484432	5716740	14.4	9.1	92.8	7.1	0.014	0.0025

SQ30782	Kaituna Stm at		1200	2484432	5716740	15.8	10.8	109.3	7.6	0.016	0.04
SQ30782	Kaituna Stm at		1430	2484432	5716740	11.5	9.9	91.8	7.5	0.016	0.081
SQ30782	Kaituna Stm at		1240	2484432	5716740	10.3	11.8	105.5	7.7	0.013	0.058
SQ30782	Kaituna Stm at		1415	2484432	5716740	11.4	11.7	106.8	7.7	0.008	0.11
SQ30782	Kaituna Stm at		1155	2484432	5716740	6.9	11.3	91.7	7.6	0.053	0.14
SQ30782	Kaituna Stm at		1335	2484432	5716740	7.2	12.3	102.1	7.3	0.01	0.14
SQ30782	Kaituna Stm at		1115	2484432	5716740	5	12.4	98.7	7.5	0.016	0.16
SQ30782	Kaituna Stm at		1425	2484432	5716740	8	11.5	96.8	7.4	0.0025	0.23
SQ30782	Kaituna Stm at		1325	2484432	5716740	13	10.7	101.3	7.7	0.016	0.027
SQ33056	Okana River at		1110	2493649	5715811	9.7	11.5	100.8	7.3	0.017	0.032
SQ33056	Okana River at		1250	2493649	5715811	13.6	11.4	109.3	7.3	0.017	0.025
SQ33056	Okana River at		1025	2493649	5715811	14.4	10.1	99.2	7.3	0.013	0.018
SQ33056	Okana River at		1015	2493649	5715811	16.1	10.9	110.7	7.2	0.019	0.016
SQ33056	Okana River at		1105	2493649	5715811	14	11.2	108.5	7.4	0.016	0.0025
SQ33056	Okana River at		950	2493649	5715811	15.6	10.4	104.7	7.7	0.023	0.034
SQ33056	Okana River at		1010	2493649	5715811	14.8	11.3	111.3	7.8	0.015	0.06
SQ33056	Okana River at		1010	2493649	5715811	8	13.1	110.7	7.6	0.013	0.047

SQ33056	Okana River at		1145	2493649	5715811	9.3	12.1	104.9	7.7	0.015	0.17
SQ33056	Okana River at		1050	2493649	5715811	8.6	13.7	117.9	7.6	0.015	0.23
SQ33056	Okana River at		1425	2493649	5715811	6.3	13	105.8	7.5	0.006	0.42
SQ33056	Okana River at		930	2493649	5715811	4.7	12.5	97.4	7.3	0.01	0.38
SQ33056	Okana River at		1015	2493649	5715811	8.7			7.5	0.0025	0.26
SQ35157	Takamatua		1141	2507631	5713917	15.3	8.6	85	7.3	0.018	0.014
SQ35157	Takamatua		1058	2507631	5713917	11.3	10.6	95.6	7.6	0.011	0.16
SQ35157	Takamatua		1120	2507631	5713917	11.5			7.7	0.018	0.42
SQ35157	Takamatua		839	2507631	5713917	5.2	11.6	91.7	7.4	0.011	0.6
SQ35160	Balguerie Stream		1200	2507381	5711498	14	8.3	78.3	7.7	0.008	0.011
SQ35160	Balguerie Stream		1115	2507381	5711498	11.2	11.4	103.4	7.5	0.009	0.12
SQ35160	Balguerie Stream		1135	2507381	5711498	11			7.7	0.021	0.36
SQ35160	Balguerie Stream		847	2507381	5711498	5.8	11.9	95.4	7.5	0.01	0.46
SQ35235	Pawsons Stream		1123	2504633	5718551	14.1	9.7	94.5	7.8	0.006	0.025
SQ35235	Pawsons Stream		1039	2504633	5718551	10.8	11.1	100.4	8	0.46	0.31
SQ35235	Pawsons Stream		1107	2504633	5718551	12			7.9	0.03	0.33
SQ35235	Pawsons Stream		817	2504633	5718551	5	12.3	96.3	7.6	0.015	0.43

Table 8.5.7.4 B: Canterbury Regional Council: Water quality data for stream sites as obtained from the council database (7-11 of 11 variables).

Site_ID	Source	Description	Date	Time	Easting	Northing	Total Nitrogen	Dissolved Reactive Phosphorus	Total Phosphorus	Total Suspended Solids	Turbidity
							mg/L N	mg/L P	mg/L P	mg/L	NTU
SQ10005	Omarama Stream	Omarama (SH8)	26-Apr-10	1254	2268079	5630925	0.19	0.007	0.016	5.9	1.3
SQ10005	Omarama Stream	Omarama (SH8)	18-Jan-10	1334	2268079	5630925	0.2	0.009	0.015	1.9	0.5
SQ10005	Omarama Stream	Omarama (SH8)	19-Oct-09	1256	2268079	5630925	0.2	0.006	0.026	7.2	2.7
SQ10005	Omarama Stream	Omarama (SH8)	20-Jul-09	1345	2268079	5630925	0.5	0.004	0.013	4.2	1.3
SQ10206	SPRING CREEK	SH8	28-Apr-10	1047	2272594	5647848	0.13	0.0005	0.004	0.25	0.2
SQ10206	SPRING CREEK	SH8	20-Jan-10	1107	2272594	5647848	0.11	0.002	0.004	0.8	0.2
SQ10206	SPRING CREEK	SH8	21-Oct-09	1152	2272594	5647848	0.04	0.0005	0.004	1.2	0.3
SQ10206	SPRING CREEK	SH8	22-Jul-09	1059	2272594	5647848	0.18	0.0005	0.004	0.25	0.3
SQ10275	Maryburn	SH8 Bridge	26-Apr-10	1004	2295987	5666858	0.04	0.001	0.008	1.9	0.5

SQ10275	Maryburn	SH8 Bridge	18-Jan-10	1113	2295987	5666858	0.04	0.002	0.02	2.6	0.6
SQ10275	Maryburn	SH8 Bridge	19-Oct-09	1009	2295987	5666858	0.04	0.004	0.023	7.5	2.9
SQ10275	Maryburn	SH8 Bridge	20-Jul-09	1020	2295987	5666858	0.04	0.001	0.008	1.4	0.8
SQ10823	Quailburn	Henburn Road	18-Jan-10	1253	2265526	5635403	0.04	0.005	0.018	1.7	0.9
SQ10823	Quailburn	Henburn Road	19-Oct-09	1215	2265526	5635403	0.04	0.005	0.017	4.1	1.6
SQ10823	Quailburn	Henburn Road	20-Jul-09	1227	2265526	5635403	0.04	0.0005	0.004	1.9	0.9
SQ10823	Quailburn	Henburn Road	20-Apr-09	1238	2265526	5635403	0.04	0.004	0.013	1.2	0.6
SQ20243	OPIHI RIVER	SH1 BRIDGE	16-Mar-10	925	2371968	5659006	0.22	0.0005	0.004	1	0.4
SQ20243	OPIHI RIVER	SH1 BRIDGE	1-Dec-09	1009	2371968	5659006	0.4	0.003	0.004	1.4	0.3
SQ20243	OPIHI RIVER	SH1 BRIDGE	15-Sep-09	905	2371968	5659006	0.99	0.004	0.004	1.3	0.4
SQ20243	OPIHI RIVER	SH1 BRIDGE	16-Jun-09	948	2371968	5659006	1	0.005	0.012	4.5	4
SQ21045	Ohapi Creek	Guild Rd	3-May-10	1313	2376290	5664470	0.48	0.03	0.042	4.8	2.5
SQ21045	Ohapi Creek	Guild Rd	1-Feb-10	1252	2376290	5664470	0.17	0.034	0.041	2.4	0.5
SQ21045	Ohapi Creek	Guild Rd	9-Nov-09	1340	2376290	5664470	0.31	0.012	0.024	12	2.6
SQ21045	Ohapi Creek	Guild Rd	10-Aug-09	1312	2376290	5664470	0.58	0.011	0.027	15	5.2
SQ21162	Waikakahi Stream	Glenavy Tawai Road	15-Apr-10	1024	2357991	5586803	1.8	0.065	0.09	3.6	2.3
SQ21162	Waikakahi Stream	Glenavy Tawai Road	18-Feb-10	1129	2357991	5586803	1.5	0.18	0.18	9.2	2.4

SQ21162	Waikakahi Stream	Glenavy Tawai Road	17-Dec-09	1013	2357991	5586803	1.9	0.076	0.097	2.7	1.3
SQ21162	Waikakahi Stream	Glenavy Tawai Road	15-Oct-09	1027	2357991	5586803	2.1	0.034	0.047	4	2.9
SQ21162	Waikakahi Stream	Glenavy Tawai Road	13-Aug-09	1047	2357991	5586803	4.1	0.02	0.027	1.9	1.6
SQ21162	Waikakahi Stream	Glenavy Tawai Road	18-Jun-09	1102	2357991	5586803	4.4	0.029	0.038	4.4	2.7
SQ26369	Irishman Creek	SH8 Windy Ridges	26-Apr-10	946	2297713	5676644	0.04	0.001	0.004	0.25	0.2
SQ26369	Irishman Creek	SH8 Windy Ridges	18-Jan-10	1055	2297713	5676644	0.04	0.002	0.016	0.7	0.2
SQ26369	Irishman Creek	SH8 Windy Ridges	19-Oct-09	958	2297713	5676644	0.04	0.002	0.004	0.25	0.4
SQ26369	Irishman Creek	SH8 Windy Ridges	20-Jul-09	1004	2297713	5676644	0.04	0.0005	0.004	0.5	0.3
SQ30103	Pahau R	at SH7	27-May-10	1105	2496025	5823331	0.74	0.042	0.64	820	570
SQ30103	Pahau R	at SH7	22-Apr-10	1110	2496025	5823331	1	0.003	0.004	1.2	0.4
SQ30103	Pahau R	at SH7	18-Mar-	1325	2496025	5823331	1.3	0.006	0.013	2	0.5

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SQ30103	Pahau R	at SH7	18-Feb-10	1120	2496025	5823331	1.8	0.007	0.013	0.25	0.4
SQ30103	Pahau R	at SH7	21-Jan-10	1000	2496025	5823331	1.3	0.005	0.012	1.8	0.6
SQ30103	Pahau R	at SH7	15-Dec-09	1015	2496025	5823331	0.66	0.007	0.013	4.2	4
SQ30103	Pahau R	at SH7	19-Nov-09	1015	2496025	5823331	0.43	0.004	0.004	0.9	0.6
SQ30103	Pahau R	at SH7	15-Oct-09	1030	2496025	5823331	0.2	0.007	0.067	85	50
SQ30103	Pahau R	at SH7	24-Sep-09	1105	2496025	5823331	0.28	0.004	0.004	2.7	1.5
SQ30103	Pahau R	at SH7	20-Aug-09	1115	2496025	5823331	0.32	0.007	0.013	5.7	3.9
SQ30103	Pahau R	at SH7	23-Jul-09	1110	2496025	5823331	0.41	0.006	0.031	31	23
SQ30103	Pahau R	at SH7	18-Jun-09	1145	2496025	5823331	1	0.01	0.01	0.7	0.6
SQ30175	Ashley R	at SH1	31-May-10	1211	2484800	5770000	1.1	0.011	0.059	44	130
SQ30175	Ashley R	at SH1	24-Feb-10	920	2484800	5770000	0.15	0.003	0.004	0.8	0.2
SQ30175	Ashley R	at SH1	26-Nov-09	920	2484800	5770000	0.21	0.004	0.004	1.5	0.6
SQ30175	Ashley R	at SH1	3-Sep-09	1015	2484800	5770000	0.18	0.004	0.016	24	16
SQ30184	Ashley R	at Gorge bge	31-May-10	911	2447345	5775206	0.52	0.012	0.16	57	59
SQ30184	Ashley R	at Gorge bge	24-Feb-10	1030	2447345	5775206	0.04	0.0005	0.004	0.8	0.2

SQ30184	Ashley R	at Gorge bge	26-Nov-09	1030	2447345	5775206	0.14	0.001	0.004	0.25	0.3
SQ30184	Ashley R	at Gorge bge	3-Sep-09	1100	2447345	5775206	0.11	0.005	0.015	20	13
SQ30400	Cust R	at Skewbridge Road	6-May-10	1135	2479939	5759498	4.1	0.02	0.028	1.2	0.8
SQ30400	Cust R	at Skewbridge Road	25-Feb-10	1150	2479939	5759498	3.8	0.047	0.056	0.9	0.5
SQ30400	Cust R	at Skewbridge Road	25-Nov-09	1100	2479939	5759498	4.9	0.025	0.045	5.6	1.8
SQ30400	Cust R	at Skewbridge Road	26-Aug-09	1150	2479939	5759498	5.5	0.015	0.046	17	7.2
SQ30916	Selwyn R	at Coes Ford	13-May-10	1245	2462681	5723316	5.1	0.018	0.02	0.25	0.1
SQ30916	Selwyn R	at Coes Ford	8-Apr-10	1225	2462681	5723316	4.6	0.005	0.019	1	0.2
SQ30916	Selwyn R	at Coes Ford	16-Mar-10	1130	2462681	5723316	4.6	0.014	0.018	0.25	0.2
SQ30916	Selwyn R	at Coes Ford	2-Feb-10	1150	2462681	5723316	4.6	0.009	0.015	1	0.2
SQ30916	Selwyn R	at Coes Ford	13-Jan-10	922	2462681	5723316	4.6	0.01	0.019	0.5	0.2
SQ30916	Selwyn R	at Coes Ford	17-Dec-09	1050	2462681	5723316	4.8	0.008	0.009	0.25	0.3
SQ30916	Selwyn R	at Coes Ford	3-Nov-09	1250	2462681	5723316	3.5	0.0005	0.004	0.7	0.4

SQ30916	Selwyn R	at Coes Ford	8-Oct-09	1120	2462681	5723316	5.4	0.004	0.008	1.1	0.4
SQ30916	Selwyn R	at Coes Ford	17-Sep-09	1240	2462681	5723316	5.4	0.003	0.004	0.6	0.4
SQ30916	Selwyn R	at Coes Ford	6-Aug-09	1102	2462681	5723316	5.3	0.009	0.008	0.25	0.4
SQ30916	Selwyn R	at Coes Ford	9-Jul-09	1240	2462681	5723316	2.8	0.005	0.02	9.7	6.8
SQ30916	Selwyn R	at Coes Ford	18-Jun-09	1016	2462681	5723316	5.4	0.01	0.016	0.25	0.3
SQ30928	Selwyn R	at Whitecliffs recorder site	24-May-10	1155	2420428	5748976	0.21	0.007	0.004	0.25	0.2
SQ30928	Selwyn R	at Whitecliffs recorder site	10-Feb-10	1100	2420428	5748976	0.26	0.001	0.004	0.25	0.2
SQ30928	Selwyn R	at Whitecliffs recorder site	16-Nov-09	1040	2420428	5748976	0.16	0.002	0.004	0.25	0.2
SQ30928	Selwyn R	at Whitecliffs recorder site	17-Aug-09	1200	2420428	5748976	0.35	0.001	0.004	0.6	0.3
SQ30976	Boggy Ck	at Lake Rd	13-May-10	1205	2458304	5715571	7	0.025	0.039	2.4	0.7
SQ30976	Boggy Ck	at Lake Rd	8-Apr-10	1150	2458304	5715571	6.2	0.002	0.016	2.1	0.4
SQ30976	Boggy Ck	at Lake Rd	16-Mar-10	1040	2458304	5715571	5.7	0.02	0.036	4.3	0.8
SQ30976	Boggy Ck	at Lake Rd	2-Feb-10	1055	2458304	5715571	4.9	0.025	0.05	3.3	0.5
SQ30976	Boggy Ck	at Lake Rd	13-Jan-10	857	2458304	5715571	0.19	0.004	0.038	6.8	1.2

SQ30976	Boggy Ck	at Lake Rd	17-Dec-09	1000	2458304	5715571	7.1	0.037	0.066	3.9	1.4
SQ30976	Boggy Ck	at Lake Rd	3-Nov-09	1150	2458304	5715571	7.2	0.003	0.029	15	31
SQ30976	Boggy Ck	at Lake Rd	8-Oct-09	1040	2458304	5715571	8.1	0.006	0.026	7.4	2.3
SQ30976	Boggy Ck	at Lake Rd	17-Sep-09	1200	2458304	5715571	8.6	0.007	0.027	8.4	2.6
SQ30976	Boggy Ck	at Lake Rd	6-Aug-09	1030	2458304	5715571	0.49	0.025	0.16	10	19
SQ30976	Boggy Ck	at Lake Rd	9-Jul-09	1140	2458304	5715571	7.2	0.029	0.057	3.3	2.8
SQ30976	Boggy Ck	at Lake Rd	18-Jun-09	947	2458304	5715571	0.36	0.005	0.004	6.3	0.3
SQ33274	Lyell Creek	at Mills Road	28-Apr-10	1610	2565900	5869865	1	0.015	0.035	13	2.6
SQ33274	Lyell Creek	at Mills Road	28-Jan-10	820	2565900	5869865	1.3	0.006	0.02	2.9	0.6
SQ33274	Lyell Creek	at Mills Road	28-Oct-09	1645	2565900	5869865	1.5	0.006	0.022	3.1	1.2
SQ33274	Lyell Creek	at Mills Road	28-Jul-09	1540	2565900	5869865	1.6	0.01	0.021	7.5	1.7
SQ33729	DRY STREAM	Above Bridge on S.H.7	27-May- 10	945	2494966	5821496	2.3	0.18	0.28	25	25
SQ33729	DRY STREAM	Above Bridge on S.H.7	22-Apr-10	930	2494966	5821496	0.04	0.003	0.009	3.4	1.4
SQ33729	DRY STREAM	Above Bridge on S.H.7	18-Mar- 10	1150	2494966	5821496	0.31	0.006	0.014	0.8	0.6
SQ33729	DRY STREAM	Above Bridge on S.H.7	18-Feb-10	910	2494966	5821496	0.23	0.026	0.043	7.2	2.5
SQ33729	DRY STREAM	Above Bridge	21-Jan-10	825	2494966	5821496	0.35	0.0005	0.039	7.9	2.4

		on S.H.7									
SQ33729	DRY STREAM	Above Bridge on S.H.7	15-Dec-09	930	2494966	5821496	0.34	0.005	0.027	5.1	5.6
SQ33729	DRY STREAM	Above Bridge on S.H.7	19-Nov- 09	830	2494966	5821496	0.04	0.005	0.037	29	12
SQ33729	DRY STREAM	Above Bridge on S.H.7	15-Oct-09	835	2494966	5821496	0.21	0.002	0.014	9.8	6.2
SQ33729	DRY STREAM	Above Bridge on S.H.7	24-Sep-09	920	2494966	5821496	0.04	0.001	0.011	6.3	3.4
SQ33729	DRY STREAM	Above Bridge on S.H.7	20-Aug-09	945	2494966	5821496	0.96	0.019	0.052	4.4	6.9
SQ33729	DRY STREAM	Above Bridge on S.H.7	23-Jul-09	935	2494966	5821496	1.5	0.014	0.024	2.2	2.3
SQ33962	Waipara River	at Laidmore Rd	31-May- 10	1044	2476590	5794100	1.1	0.014	0.094	28	30
SQ33962	Waipara River	at Laidmore Rd	24-Feb-10	1210	2476590	5794100	0.04	0.0005	0.004	0.7	0.2
SQ33962	Waipara River	at Laidmore Rd	26-Nov- 09	1145	2476590	5794100	0.04	0.004	0.008	0.6	0.4
SQ33962	Waipara River	at Laidmore Rd	3-Sep-09	1215	2476590	5794100	0.13	0.003	0.008	2.6	3.8
SQ34191	Taranaki Creek	Preece Rd,	3-May-10	1150	2484760	5766912	0.54	0.015	0.022	3.5	1.4

		main Trib near Marae										
SQ34191	Taranaki Creek	Preece Rd, main Trib near Marae	8-Feb-10	1115	2484760	5766912	0.46	0.014	0.028	4.4	2.4	
SQ34191	Taranaki Creek	Preece Rd, main Trib near Marae	11-Nov- 09	1030	2484760	5766912	0.44	0.004	0.018	8.4	2.6	
SQ34191	Taranaki Creek	Preece Rd, main Trib near Marae	10-Aug-09	1155	2484760	5766912	0.93	0.008	0.026	15	4.9	
SQ35235	Pawsons Stream	Above 2nd Bridge, up Valley	23-Mar- 10	1123	2504633	5718551	0.04	0.029	0.041	0.9	0.5	
SQ35235	Pawsons Stream	Above 2nd Bridge, up Valley	2-Dec-09	1039	2504633	5718551	1.1	0.13	0.32	31	16	
SQ35235	Pawsons Stream	Above 2nd Bridge, up Valley	2-Sep-09	1107	2504633	5718551	0.38	0.033	0.062	9.1	4.6	

SQ35235	Pawsons Stream	Above 2nd Bridge, Valley up	3-Jun-09	817	2504633	5718551	0.52	0.021	0.038	3.1	2.4
SQ26931	Bush Stream Rangitata Gorge Road, at bridge Site No:SQ26931		20-Apr-10	1150	2338801	5729568	0.04	0.0005	0.008	0.25	0.2
SQ26931	Bush Stream Rangitata Gorge Road, at bridge Site No:SQ26931		9-Feb-10	922	2338801	5729568	0.04	0.003	0.004	0.6	0.3
SQ26931	Bush Stream Rangitata Gorge Road, at bridge Site No:SQ26931		22-Dec-09	958	2338801	5729568	0.04	0.002	0.004	0.6	0.3
SQ26931	Bush Stream Rangitata Gorge Road, at bridge Site No:SQ26931		7-Oct-09	1201	2338801	5729568	0.04	0.0005	0.004	0.25	0.4
SQ26931	Bush Stream		6-Aug-09	1202	2338801	5729568	0.04	0.0005	0.004	0.25	0.7

	Rangitata Gorge Road, at bridge Site No:SQ26931										
SQ26931	Bush Stream Rangitata Gorge Road, at bridge Site No:SQ26931		8-Jun-09	1144	2338801	5729568	0.04	0.005	0.004	0.6	1
SQ30707	Aylmers Valley Stream Beach Road bridge (Akaroa) Site No:SQ30707		23-Mar- 10	1308	2506916	5710792	0.1	0.055	0.06	1.4	0.6
SQ30707	Aylmers Valley Stream Beach Road bridge (Akaroa) Site No:SQ30707		2-Dec-09	1138	2506916	5710792	0.33	0.047	0.074	5.7	3.6
SQ30707	Aylmers Valley Stream Beach Road bridge (Akaroa) Site No:SQ30707		2-Sep-09	1145	2506916	5710792	0.43	0.043	0.053	3.1	2.5
SQ30707	Aylmers Valley		3-Jun-09	859	2506916	5710792	0.54	0.027	0.039	1.3	0.7

	Stream Beach Road bridge (Akaroa) Site No:SQ30707										
SQ30782	Kaituna Stm at recorder Site No:SQ30782		13-May- 10	1405	2484432	5716740	0.13	0.035	0.057	1.9	1.5
SQ30782	Kaituna Stm at recorder Site No:SQ30782		8-Apr-10	1350	2484432	5716740	0.11	0.009	0.055	2.4	2.2
SQ30782	Kaituna Stm at recorder Site No:SQ30782		16-Mar- 10	1240	2484432	5716740	0.04	0.022	0.061	60	1
SQ30782	Kaituna Stm at recorder Site No:SQ30782		2-Feb-10	1300	2484432	5716740	0.04	0.015	0.038	1.7	0.8
SQ30782	Kaituna Stm at recorder Site No:SQ30782		13-Jan-10	1049	2484432	5716740	0.1	0.019	0.046	1.7	1.5
SQ30782	Kaituna Stm at recorder Site No:SQ30782		17-Dec-09	1200	2484432	5716740	0.04	0.022	0.043	1.1	1.6

	No:SQ30782										
SQ30782	Kaituna Stm at recorder Site No:SQ30782		3-Nov-09	1430	2484432	5716740	0.16	0.003	0.068	11	46
SQ30782	Kaituna Stm at recorder Site No:SQ30782		8-Oct-09	1240	2484432	5716740	0.04	0.014	0.03	1.7	1.7
SQ30782	Kaituna Stm at recorder Site No:SQ30782		17-Sep-09	1415	2484432	5716740	0.15	0.014	0.035	1.9	2
SQ30782	Kaituna Stm at recorder Site No:SQ30782		6-Aug-09	1155	2484432	5716740	0.14	0.01	0.019	1.3	1.4
SQ30782	Kaituna Stm at recorder Site No:SQ30782		9-Jul-09	1335	2484432	5716740	0.26	0.011	0.026	4.6	2.7
SQ30782	Kaituna Stm at recorder Site No:SQ30782		18-Jun-09	1115	2484432	5716740	0.29	0.009	0.02	1.9	1.7
SQ30782	Kaituna Stm at		12-May-	1425	2484432	5716740	0.35	0.015	0.037	7	3.8

	recorder Site No:SQ30782		09								
SQ30782	Kaituna Stm at recorder Site No:SQ30782		15-Apr-09	1325	2484432	5716740	0.04	0.021	0.044	0.9	0.8
SQ33056	Okana River at SH 75 Site No:SQ33056		10-May- 10	1110	2493649	5715811	0.04	0.029	0.057	1.4	1.4
SQ33056	Okana River at SH 75 Site No:SQ33056		14-Apr-10	1250	2493649	5715811	0.1	0.024	0.06	1.3	1.5
SQ33056	Okana River at SH 75 Site No:SQ33056		24-Mar- 10	1025	2493649	5715811	0.12	0.03	0.065	2.3	1.7
SQ33056	Okana River at SH 75 Site No:SQ33056		17-Feb-10	1015	2493649	5715811	0.23	0.032	0.061	2.3	1.5
SQ33056	Okana River at SH 75 Site No:SQ33056		18-Jan-10	1105	2493649	5715811	0.04	0.031	0.057	2.1	1.5

SQ33056	Okana River at SH 75 Site No:SQ33056		9-Dec-09	950	2493649	5715811	0.04	0.024	0.049	3	1.9
SQ33056	Okana River at SH 75 Site No:SQ33056		24-Nov- 09	1010	2493649	5715811	0.1	0.026	0.048	4	2.3
SQ33056	Okana River at SH 75 Site No:SQ33056		21-Oct-09	1010	2493649	5715811	0.08	0.017	0.023	4.4	2.8
SQ33056	Okana River at SH 75 Site No:SQ33056		23-Sep-09	1145	2493649	5715811	0.23	0.027	0.057	5.3	4.9
SQ33056	Okana River at SH 75 Site No:SQ33056		24-Aug-09	1050	2493649	5715811	0.36	0.016	0.042	4.1	6.3
SQ33056	Okana River at SH 75 Site No:SQ33056		16-Jul-09	1425	2493649	5715811	0.48	0.018	0.035	4.2	3.4
SQ33056	Okana River at SH 75 Site		5-Jun-09	930	2493649	5715811	0.42	0.015	0.025	3.3	2.9

	No:SQ33056										
SQ33056	Okana River at SH 75 Site No:SQ33056		15-May- 09	1015	2493649	5715811	0.33	0.02	0.044	6.3	5.1
SQ35157	Takamatua Stream Above Highway Bridge Site No:SQ35157		23-Mar- 10	1141	2507631	5713917	0.04	0.02	0.037	1.6	0.5
SQ35157	Takamatua Stream Above Highway Bridge Site No:SQ35157		2-Dec-09	1058	2507631	5713917	0.22	0.028	0.049	2.3	1.7
SQ35157	Takamatua Stream Above Highway Bridge Site No:SQ35157		2-Sep-09	1120	2507631	5713917	0.44	0.027	0.044	2.7	3
SQ35157	Takamatua Stream Above Highway Bridge Site No:SQ35157		3-Jun-09	839	2507631	5713917	0.6	0.02	0.034	4.1	2

SQ35160	Balguerie Stream Upstream of Bridge on Rue Jolie Site No:SQ35160		23-Mar- 10	1200	2507381	5711498	0.04	0.026	0.045	0.7	0.4
SQ35160	Balguerie Stream Upstream of Bridge on Rue Jolie Site No:SQ35160		2-Dec-09	1115	2507381	5711498	0.2	0.038	0.062	3.5	2.9
SQ35160	Balguerie Stream Upstream of Bridge on Rue Jolie Site No:SQ35160		2-Sep-09	1135	2507381	5711498	0.36	0.035	0.05	2.9	2.5
SQ35160	Balguerie Stream Upstream of Bridge on Rue Jolie Site No:SQ35160		3-Jun-09	847	2507381	5711498	0.45	0.024	0.035	1.5	1.4
SQ35235	Pawsons Stream Above 2nd Bridge, up Valley Site No:SQ35235		23-Mar- 10	1123	2504633	5718551	0.04	0.029	0.041	0.9	0.5

SQ35235	Pawsons Stream Above 2nd Bridge, up Valley Site No:SQ35235		2-Dec-09	1039	2504633	5718551	1.1	0.13	0.32	31	16
SQ35235	Pawsons Stream Above 2nd Bridge, up Valley Site No:SQ35235		2-Sep-09	1107	2504633	5718551	0.38	0.033	0.062	9.1	4.6
SQ35235	Pawsons Stream Above 2nd Bridge, up Valley Site No:SQ35235		3-Jun-09	817	2504633	5718551	0.52	0.021	0.038	3.1	2.4

8.6 Macroinvertebrate community index (MCI) data from 2010 sampling

	All sites	Regional Identifier	MCI-2010
1	Aroara	AK_AR	112.1
2	Ararimu	AK_ARM	106.1
3	Awanohi upper	AK_AU	122.8
4	Awarere dibble	AK_AWD	121.9
5	Awanohi mid	AK_AWN	106.7
6	Campbell's Bay	AK_CB	73.7
7	Chatswood	AK_CH	87.4
8	Cascades	AK_CS	91
9	Duder	AK_D	79
10	Duck creek	AK_DC	71.4
11	Dyers creek bush	AK_DCB	111.6
12	Dyers creek paddock	AK_DCP	123.3
13	Eskdale lower	AK_EL	88.2
14	Eskdale mid	AK_EM	84.9
15	Eskdale upper	AK_EU	117.1
16	Hoteo (kraak hill)	AK_HKH	99.3
17	Kumeu	AK_K	62.1
18	Kaukapakapa	AK_KKP	125.7
19	Konini	AK_KN	131.7
20	Kauriotaki	AK_KT	126.9
21	Lignite	AK_LG	80.5
22	Lucas	AK_LU	86.3
23	Lower Vaughan	AK_LV	67.6
24	Motutapu	AK_M	85.3
25	Mt Auckland	AK_MA	130.1
26	Mahurangi LTB	AK_MH	99.3
27	Makarau	AK_MK	75.7
28	Milne	AK_ML	133.3
29	Mahurangi Trappitt	AK_MR	118.6
30	Matakana LTB	AK_MTK	93
31	Mangatawhiri	AK_MTW	131.9
32	Mauku	AK_MU	74.1
33	Marawhara	AK_MW	136.4
34	Ngakaroa	AK_NK	82.4
35	Nukumea	AK_NKU	117.2
36	Onepoto	AK_O	84.9
37	Orere A	AK_OA1	129.5

38	Oakley	AK_OAK1	62.9
39	Okura at Awanohi	AK_OAW	90.4
40	Orere B	AK_OB	132.6
41	Okura tributary	AK_OK	106.4
42	Opanuku	AK_OP	92.3
43	Okura Reserve	AK_OR	134.6
44	Okura Tributary II	AK_OT	99.1
45	Oteha	AK_OTH	70.5
46	Otanerua	AK_OTN	117.7
47	Otara	AK_OTR	54.9
48	Puhinui Tributary	AK_PB	65.2
49	Puhoi	AK_PH	131
50	Puhunui LTB	AK_PHN	42.6
51	Papakura	AK_PP	60.6
52	Puhinui Upper	AK_PU	99
53	Riverhead	AK_RH	109.7
54	Shakespeare Bay	AK_SH	115.2
55	Hunua at St Paul's	AK_SP	121.1
56	Symonds	AK_SY	108
57	Tawharanui	AK_TRN	117.9
58	Vaughan Upper	AK_VU	116.6
59	Wairoa Tributary	AK_WB	135.7
60	Waiwhui Firth	AK_WF	106.5
61	Waitangi	AK_WG	73.3
62	West Hoe	AK_WH	113.1
63	Wekatohi	AK_WK	127.4
64	Wairoa Tourist	AK_WS	117
65	Waitakere	AK_WT	116.5
66	Ashburton R Nth	CB_ABT	110
67	Ashley River-Ashley Gorge	CB_AG	115.6
68	Aylmers Stream (Akaroa)	CB_AKR	132
69	Ashley River-SH1	CB_ASH	110
70	Balguerie Stream	CB_BAL	130
71	Boggy Ck at Lake Rd	CB_BOG	82
72	Bush Stm	CB_BSH	104
73	Coal Stream	CB_CL	98.8
74	Cust Main Drain @ Skewbridge Rd	CB_CMD	98.6
75	Curletts Rd drain	CB_CUR	74.3
76	Dry Stream	CB_DRY	78.2
77	Dudley Creek	CB_DUD	64.6
78	Ealing Spring	CB_EAL	104
79	Fork Stream	CB_FRK	96

80	Glenfield Stream	CB_GLN	92.5
81	Halls Stream	CB_HAL	81.5
82	Heathcote River	CB_HC	48.9
83	Harmans/Opuahou Stream	CB_HRM	X
84	Hurunui R at SH7 bridge	CB_HRN	108
85	Irishman Creek	CB_IRC	106.1
86	Kowhai River at SH1	CB_KOW	152
87	Kaiapoi River -NIWA fish hatchery	CB_KP	90.6
88	Kaituna Stm	CB_KTN	120
89	Lyell Creek at Mill Rd	CB_LYL	90
90	Mary Burn	CB_MB	106.7
91	Ohapi Creek at Guild Rd	CB_OHP	83.5
92	Okana River	CB_OKN	X
93	Okuti River	CB_OKU	X
94	Omarama Stream at SH8	CB_OMR	88.6
95	Opihi at SH1	CB_OPH	103.6
96	Opuha River below Skiptons bridge	CB_OPU	91.4
97	Pahau R at SH7	CB_PAH	108.9
98	Pareora River - Pareora Rd bridge	CB_PAR	100
99	Pawsons Stream	CB_PAW	78
100	Petries Creek at Canal Rd	CB_PET	88
101	Prices Stm	CB_PRS	86.3
102	Prices tributary	CB_PRT	X
103	Quail Burn	CB_QLB	92.2
104	Raincliff Stream	CB_RAN	74.3
105	Selwyn R @ Whitecliffs Domain	CB_SEL	124.7
106	School Stm	CB_SKL	70
107	Spring Creek	CB_SPR	94.7
108	Selwyn Rr at Coe's Ford	CB_SR	105.5
109	Styx River-Styx Mill Reserve	CB_STX	94.3
110	Takamatua Stream	CB_TKM	X
111	Taranaki Ck at Preeces Rd bridge	CB_TNK	67.7
112	Avon-Victoria Square	CB_VIC	64
113	Waikakahi at Glenavy Tawai Rd	CB_WK	87.1
114	Waimari	CB_WMR	77.3
115	Waipara River @ Laidmore Rd	CB_WPR	112.2
116	319 Anarua at Skudders Road 39825	HB_ANA	105.7
117	Ananiwaniwa # 333	HB_ANI	126.5
118	Esk @ Waipunga # 39811	HB_ESK	109
119	Hangaroa # 337	HB_HAN	102
120	Herehere stream	HB_HER	66.4
121	Makaretu SH50 L9	HB_MAK	118.4

122	Mangaonuka at Tikokino 284	HB_MAN	90
123	Mangakuri 2414	HB_MGK	85.8
124	Mangataroa	HB_MGT	83
125	Mohaka downstream of Taharua	HB_MKD	122.9
126	Mokomokonui	HB_MKM	134
127	Mohaka upstream of Taharua	HB_MKU	122.9
128	Manga at K	HB_MNK	83.3
129	Mangaone at Rissington site ID 266 / 39883	HB_MNR	115.7
130	Manga at Te Aut	HB_MNT	63.8
131	Mohaka at Raupunga 39824	HB_MRP	109
132	Mohaka at Willow flat	HB_MWF	128.3
133	Porangahau 397	HB_PGH	100
134	Porangahau at Kate's quarry site 14	HB_POR	86
135	Puhokio at Te Apiti	HB_PUH	96.7
136	Ruahapia	HB_RHP	67
137	Ripia upstream Mohaka 604 / 39816	HB_RIP	127.3
138	Ruatitiri 336	HB_RUA	119.2
139	Te Iringawhare #341	HB_TIW	96
140	Tukipo SH50 #144	HB_TKP	107.5
141	Tukituki at SH50 356	HB_TKT	110.8
142	Taharua at Poronui	HB_TP	118.2
143	Tukituki at Red bridge 407	HB_TRB	95.7
144	Tukituki at Shagrock 281	HB_TSH	97.9
145	Tukituki BB15	HB_TUK	77.3
146	Tutaekuri at Lawrence Hut # 39885	HB_TUT	124.8
147	Waikaretaheke #1319	HB_WKR	108.8
148	Waipawa SH50 #280	HB_WP	110
149	Brandscombe bridge	HR_BR	126
150	Hautapu u/b Rangitiki	HR_HAU	74
151	Hokio stream at Lake outlet	HR_HOK	80
152	Hautapu at Alabasters	HR_HT	102
153	Kahutarawa at Johnsons Rata	HR_KH	115
154	Makotuku u/s Raetihi	HR_MAK	106
155	Mangatainoka at SH2 bridge	HR_MAN	115
156	Mangawhero at Doc HQ	HR_MD	142
157	Mangahau at Ballance	HR_MHB	111
158	Makuri at Tuscan Hills	HR_MK	114
159	Manawatu at Opiki	HR_MO	110
160	Mangatainoka at Putara	HR_MP	156
161	Mangapapa at Troup road	HR_MPT	126
162	Manganui - O-Te Ao at Ashworth bridge	HR_MTA	112

163	Manawatu at Teachers College	HR_MTC	120
164	Manawatu at Upper Gorge	HR_MUG	128
165	Manawatu at Hopelands	HR_MW	97
166	Manawatu at Weber	HR_MWB	96
167	Mangawhero at Pakahi Road bridge	HR_MWP	115
168	Manawatu at Whirikino	HR_MWW	80
169	Oroua at Apiti gorge	HR_OAG	129
170	Oroua at Almadale	HR_OAL	94
171	Oroua at SH2	HR_OK	127
172	Oroua at Awahiri	HR_ORO	100
173	Pohangina at Piripiri	HR_PHP	139
174	Porewa at Onepuhi	HR_PR	95
175	Rangitikei at Pokeokahu	HR_RG	119
176	Rangitikei at McKelvies	HR_RM	117
177	Rangitikei at Mangaweka	HR_RMW	125
178	Rangitikei at Onepuhi	HR_RO	110
179	Tamaki at Reserve	HR_TAM	149
180	Tiraumea at Houkopua reserve	HR_TH	116
181	tiraumea at Ngaturi	HR_TIR	114
182	Tokiahuru u/s Whangaehu	HR_TK	123
183	Tokomaru at Horseshoe bend	HR_TKM	133
184	Tamaki at Stephensons	HR_TS	125
185	Whanganui at Cherry grove	HR_WC	119
186	Whanganui d/s of Retaruke	HR_WG	107
187	Whanganui at Piripiri	HR_WH	93
188	Whanganui at Te Maire	HR_WT	107
189	Borck Creek - 200m d/s of Queen street	TS_BOR	75
190	Jimmy-Lee Creek at 35 Beach Rd	TS_JLB	56
191	Jimmy-Lee creek at upstream of Hill street	TS_JLH	92
192	Jimmy-Lee Creek d/s Washbourne Gardens	TS_JLW	69
193	Redwood valley stream at u/s Eves valley stream	TS_RED	72
194	Reservoir Creek at downstream of Salisbury	TS_RES	86
195	Tasman Valley upstream at u/s of Jester house	TS_TAS	79
196	Reservoir Creek upstream of Marlborough River	TS_RM	108
197	RS53 Awhea river	WGO_AW	118
198	RS49 Beef Creek at headwaters	WGO_BC	134.2
199	RS13 Horokiri stream	WGO_HOR	120

200	Rs20 Hutt river at Te Marua	WGO_HTM	138.3
201	RS22 Hutt at Boulcott	WGO_HUT	115
202	RS18 Karori	WGO_KAR	81.7
203	RS 19 Kaiwharawhara	WGO_KWH	90.5
204	RS24 Mangaroa	WGO_MAN	120.7
205	RS02 Mangapouri at Bennetts road	WGO_MGP	77
206	RS50 Mangatarere stream at SH2	WGO_MTR	92.8
207	RS45 Parkvale tributary at lowes reserve	WGO_PKT	95
208	RS46 Parkvale stream at Weir	WGO_PKW	77.5
209	RS16 Porirua at Milk depot (or Wall park)	WGO_POR	96.2
210	RS37 Taueru at Gladstone	WGO_TR	96.7
211	RS36 Taueru at Castle Hill	WGO_TRC	113.5
212	RS27 Waiwhetu stream	WGO_WAI	56.2
213	RS 47 Waiohine river at Gorge	WGO_WG	141.1
214	RS48 Waiohine at Bicknells	WGO_WHB	114
215	RS09 Waikanae at Mangaone at Walkway	WGO_WKN	142.2
216	Ahirua stream, Coromandel	WK_AHR	130
217	Bankwood, Danny Park	WK_BKW	47.2
218	Gibbons creek, Hamilton	WK_GB	X
219	Hospital stream, Normandy Ave	WK_HOS	77.3
220	Hiruwai stream	WK_HW	108
221	Kaurianga river, Coromandel	WK_KAU	103.2
222	Kirikiroa at River road	WK_KIR	X
223	Karaka stream, Coromandel	WK_KRK	113.1
224	Manurimu stream	WK_MNR	102.9
225	Tributary of Mangatia stream	WK_MSB	82.9
226	Mangatia stream	WK_MTA	84.7
227	Mangakotutukutuku TL trib	WK_MTB	102.9
228	Mangakotutukutuku TL	WK_MTL	73.8
229	Mangatu, Coromandel	WK_MTU	122.7
230	Unnamed tributary of Naike stream	WK_NK	94.1
231	Oamaru stream	WK_OAM	130.5
232	Unnamed tributary of Okupata stream	WK_OKU	127.10
233	Pirongia west road, Omanuwaituia	WK_OMW	130.5
234	Mangakotutukutuku stream, peacocks	WK_PCK	97
235	Pohue	WK_PHE	104.8
236	Mangarika stream, Te tahi road, Pirangita	WK_PIR	130.4
237	Waikato river-Pukete boat ramp	WK_PKT	X
238	Paraunahi stream Coromandel	WK_PRN	110.9

239	Waikato river Swarbicks	WK_SWB	X
240	Mangakotutukutuku, Te Anau	WK_TNU	65.5
241	Te Rekereke	WK_TRK	140.8
242	Taraporiki Coromandel	WK_TRP	104.6
243	Tararu Coromandel	WK_TRU	110.8
244	Waikato river, Victoria	WK_VIC	X
245	Whangarohi, Coromandel	WK_WGR	106.4
246	Waikuku (Te kauri)	WK_WK	120.9
247	Whakakai, Whataulata	WK_WKK	150.5
248	Waiomu stream	WK_WMU	109.1
249	Wainui, Raglan	WK_WN	112.5
250	Unnamed tributary -Waitetuna river	WK_WTT	120.7
251	Waitawhiriwhiri, Edgumbe park	WK_WTW	67.7
252	Waiwawa Coromandel	WK_WW	101.8

8.7 BCI 2010 lists of all sites, all Regions

These are as generated by the model developed in this project.

Table 8.7.1: Site names sorted based on sitream identifier. Sites have prefixes based on their Regional identifier (Ak- Auckland, CB – Canterbury, HB – Hawkes Bay, HR – Horizons, TS – Tasman, WG – Wellington and WK - Waikato).

	Site names	Regional identifier	BCI 2010	Avg BCI 2010
1	Aroara	AK_AR1	11.422	
		AK_AR2	10.355	
		AK_AR3	11.308	
		AK_AR4	10.113	
		AK_AR5	11.579	10.955
2	Ararimu	AK_ARM1	10.237	
		AK_ARM2	9.951	
		AK_ARM3	9.351	
		AK_ARM4	10.695	
		AK_ARM5	11.075	10.262
3	Awanohi upper	AK_AU1	11.479	
		AK_AU2	11.846	
		AK_AU3	10.59	
		AK_AU4	10.564	
		AK_AU5	11.672	11.23
4	Awarere dibble	AK_AWD1	11.117	
		AK_AWD2	11.608	
		AK_AWD3	12.941	
		AK_AWD4	10.022	
		AK_AWD5	11.293	11.396
5	Awanohi mid	AK_AWN1	11.302	
		AK_AWN3	10.476	
		AK_AWN4	11.777	
		AK_AWN5	11.385	11.235
6	Campbell's Bay	AK_CB1	7.301	
		AK_CB2	9.208	
		AK_CB3	8.213	
		AK_CB4	9.41	
		AK_CB5	8.856	8.598
7	Chatswood	AK_CH1	9.547	
		AK_CH2	8.483	

		AK_CH3	9.514	
		AK_CH4	7.865	8.852
8	Cascades	AK_CS2	10.753	
		AK_CS3	9.365	
		AK_CS4	7.901	
		AK_CS5	7.36	8.845
9	Duder	AK_D1	8.232	
		AK_D2	8.939	
		AK_D3	8.488	
		AK_D4	8.386	
		AK_D5	9.863	8.781
10	Duck creek	AK_DC1	8.087	
		AK_DC2	10.981	
		AK_DC3	10.468	
		AK_DC4	9.213	
		AK_DC5	10.506	9.851
11	Dyers creek bush	AK_DCB1	9.515	
		AK_DCB2	14.034	
		AK_DCB4	10.849	11.466
12	Dyers creek paddock	AK_DCP1	11.465	
		AK_DCP2	11.663	
		AK_DCP4	11.351	11.493
13	Eskdale lower	AK_EL1	11.016	
		AK_EL2	10.055	
		AK_EL3	8.599	
		AK_EL4	8.545	
		AK_EL5	9.518	9.547
14	Eskdale mid	AK_EM1	11.325	
		AK_EM2	8.56	
		AK_EM3	9.686	
		AK_EM4	7.839	
		AK_EM5	7.656	9.013
15	Eskdale upper	AK_EU1	9.775	
		AK_EU2	10.439	
		AK_EU3	9.674	
		AK_EU4	11.675	
		AK_EU5	11.452	10.603
16	Hoteo (kraak hill)	AK_HKH1	10.402	
		AK_HKH2	7.51	
		AK_HKH4	10.746	9.86
		AK_HKH5	10.782	
17	Kumeu	AK_K2	7.546	

		AK_K3	9.404	
		AK_K4	8.937	
		AK_K5	7.979	8.466
18	Kaukapakapa	AK_KKP1	11.237	
		AK_KKP2	11.4	
		AK_KKP3	11.769	
		AK_KKP4	12.373	
		AK_KKP5	11.929	11.741
19	Konini	AK_KN1	12.003	
		AK_KN2	11.248	
		AK_KN3	12.016	
		AK_KN5	13.958	12.306
20	Kauritutahi	AK_KT1	10.376	
		AK_KT2	10.865	
		AK_KT3	13.048	
		AK_KT4	9.952	
		AK_KT5	13.434	11.535
21	Lignite	AK_LG1	9.31	
		AK_LG2	7.613	
		AK_LG3	8.115	
		AK_LG4	8.038	
		AK_LG5	6.651	7.946
22	Lucus	AK_LU1	9.603	
		AK_LU2	9.337	
		AK_LU3	8.936	
		AK_LU5	9.764	9.41
23	Lower Vaughan	AK_LV1	7.963	
		AK_LV2	9.324	
		AK_LV3	8.666	
		AK_LV5	8.245	8.55
24	Motutapu	AK_M1	11.328	
		AK_M2	9.717	
		AK_M3	8.814	
		AK_M4	10.308	
		AK_M5	8.939	9.821
25	Mt Auckland	AK_MA1	11.336	
		AK_MA2	13.183	
		AK_MA3	10.881	
		AK_MA5	13.16	12.14
26	Mahurangi LTB	AK_MH1	10.516	
		AK_MH2	10.529	
		AK_MH3	10.349	

		AK_MH4	10.856	
		AK_MH5	9.651	10.38
27	Makarau	AK_MK1	6.96	
		AK_MK2	9.081	
		AK_MK3	8.54	
		AK_MK4	7.684	
		AK_MK5	7.156	7.884
28	Milne	AK_ML1	13.869	
		AK_ML2	14.838	
		AK_ML4	12.458	13.721
29	Mahurangi Trappitt	AK_MR1	11.315	
		AK_MR2	9.161	
		AK_MR3	11.756	
		AK_MR4	13.069	
		AK_MR5	11.731	11.406
30	Matakana LTB	AK_MTK1	7.926	
		AK_MTK2	10.377	
		AK_MTK3	9.511	
		AK_MTK4	8.592	
		AK_MTK5	9.409	9.163
31	Mangatawhiri	AK_MTW1	13.266	
		AK_MTW2	12.125	
		AK_MTW3	14.073	
		AK_MTW4	10.795	
		AK_MTW5	13.742	12.8
32	Mauku	AK_MU1	7.834	
		AK_MU2	8.636	
		AK_MU4	9.312	8.594
33	Marawhara	AK_MW1	11.31	
		AK_MW2	12.515	
		AK_MW3	11.353	
		AK_MW4	12.301	
		AK_MW5	14.27	12.35
34	Ngakaroa	AK_NK1	9.607	
		AK_NK2	9.912	
		AK_NK3	11.098	
		AK_NK4	8.445	9.766
35	Nukumea	AK_NKU1	10.214	
		AK_NKU2	11.418	
		AK_NKU4	10.387	10.673
36	Onepoto	AK_O1	8.693	
		AK_O2	9.085	

		AK_O3	9.15	
		AK_O4	9.993	8.911
		AK_O5	7.634	
37	Orere A	AK_OA1	13.483	
		AK_OA2	11.7	
		AK_OA3	10.759	
		AK_OA4	10.519	
		AK_OA5	11.591	11.61
38	Oakley	AK_OAK1	9.26	
		AK_OAK3	8.187	
		AK_OAK4	6.944	
		AK_OAK5	7.512	7.976
39	Okura at Awanohi	AK_OAW1	10.572	
		AK_OAW2	7.919	
		AK_OAW3	8.841	
		AK_OAW4	8.667	9
40	Orere B	AK_OB1	12.446	
		AK_OB2	12.688	
		AK_OB4	13.536	12.89
41	Okura tributary	AK_OK1	9.138	
		AK_OK2	9.744	
		AK_OK3	9.896	
		AK_OK4	11.027	
		AK_OK5	10.505	10.062
42	Opanuku	AK_OP1	11.087	
		AK_OP2	11.461	
		AK_OP3	9.72	
		AK_OP4	9.233	
		AK_OP5	9.845	10.269
43	Okura Reserve	AK_OR1	12.161	
		AK_OR2	10.148	
		AK_OR3	10.111	10.807
44	Okura Tributary II	AK_OT1	10.591	
		AK_OT2	9.66	
		AK_OT3	9.785	
		AK_OT4	9.325	
		AK_OT5	9.831	9.838
45	Oteha	AK_OTH1	9.32	
		AK_OTH2	8.5	
		AK_OTH3	8.518	
		AK_OTH4	7.757	8.524
46	Otanerua	AK_OTN1	12.239	

		AK_OTN4	11.146	
		AK_OTN5	12.431	11.939
47	Otara	AK_OTR2	7.249	
		AK_OTR3	7.557	
		AK_OTR4	6.488	7.098
48	Puhinui Tributary	AK_PB1	8.741	
		AK_PB3	10.809	
		AK_PB4	9.801	
		AK_PB5	10.666	10.004
49	Puhoi	AK_PH1	11.568	
		AK_PH2	11.534	
		AK_PH3	12.498	
		AK_PH4	13.657	
		AK_PH5	12.472	12.346
50	Puhunui LTB	AK_PHN1	6.7	
		AK_PHN2	7.355	
		AK_PHN4	7.565	
		AK_PHN5	6.175	6.949
51	Papakura	AK_PP1	8.361	
		AK_PP2	8.712	
		AK_PP3	5.87	
		AK_PP4	6.177	
		AK_PP5	6.44	7.112
52	Puhinui Upper	AK_PU1	9.933	
		AK_PU2	10.055	
		AK_PU3	8.834	
		AK_PU4	8.529	
		AK_PU5	11.692	9.809
53	Riverhead	AK_RH1	10.067	
		AK_RH2	11.121	
		AK_RH3	10.417	
		AK_RH4	9.633	
		AK_RH5	10.544	10.356
54	Shakespeare Bay	AK_SH2	10.784	
		AK_SH3	11.267	
		AK_SH4	10.186	10.745
55	Hunua at St Paul's	AK_SP1	10.291	
		AK_SP2	13.968	
		AK_SP3	11.738	
		AK_SP4	13.226	
		AK_SP5	12.117	12.268
56	Symonds	AK_SY1	9.16	

		AK_SY2	9.788	
		AK_SY3	10.546	
		AK_SY4	9.576	
		AK_SY5	11.249	10.064
57	Tawharanui	AK_TRN1	9.56	
		AK_TRN2	10.217	
		AK_TRN3	10.058	
		AK_TRN5	8.84	9.669
58	Vaughan Upper	AK_VU1	9.474	
		AK_VU2	11.017	
		AK_VU3	11.684	
		AK_VU4	13.112	
		AK_VU5	11.493	11.356
59	Wairoa Tributary	AK_WB1	12.614	
		AK_WB2	11.221	
		AK_WB3	11.538	
		AK_WB4	12.881	
		AK_WB5	12.874	12.225
60	Waiwhui Firth	AK_WF1	10.788	
		AK_WF2	9.606	
		AK_WF3	10.693	10.362
61	Waitangi	AK_WG1	8.882	
		AK_WG2	10.092	
		AK_WG3	7.849	
		AK_WG4	7.314	
		AK_WG5	8.544	8.536
62	West Hoe	AK_WH1	10.675	
		AK_WH2	11.712	
		AK_WH4	12.679	11.689
63	Wekatohi	AK_WK1	12.881	
		AK_WK2	11.994	
		AK_WK3	12.528	
		AK_WK4	13.266	12.667
64	Wairoa Tourist	AK_WS1	12.123	
		AK_WS2	12.135	
		AK_WS3	11.694	
		AK_WS4	12.291	
		AK_WS5	10.628	11.774
65	Waitakere	AK_WT1	10.584	
		AK_WT3	10.756	
		AK_WT4	10.376	
		AK_WT5	11.445	10.79

66	Ashburton R Nth	CB_ABT1	8.99	
		CB_ABT2	10.305	
		CB_ABT3	10.306	
		CB_ABT4	10.396	
		CB_ABT5	10.542	10.108
67	Ashley River-Ashley Gorge	CB_AG1	11.481	
		CB_AG2	12.006	
		CB_AG3	12.207	11.898
68	Aylmers Stream (Akaroa)	CB_AKR1	11.171	
		CB_AKR2	10.496	
		CB_AKR3	13.243	
		CB_AKR4	11.884	
		CB_AKR5	13.043	11.967
69	Ashley River-SH1	CB_ASH1	9.119	
		CB_ASH2	9.928	
		CB_ASH3	9.706	
		CB_ASH4	11.458	
		CB_ASH5	9.288	9.9
70	Balguerie Stream	CB_BAL1	12.198	
		CB_BAL2	10.412	
		CB_BAL3	11.663	
		CB_BAL4	13.447	
		CB_BAL5	13.068	12.158
71	Boggy Ck at Lake Rd	CB_BOG1	7.098	
		CB_BOG3	7.422	
		CB_BOG5	6.611	7.044
72	Bush Stm	CB_BSH1	10.92	
		CB_BSH2	9.005	
		CB_BSH3	7.81	
		CB_BSH4	10.432	
		CB_BSH5	10.8	9.793
73	Heathcote River	CB_HC1	7.771	
		CB_HC2	8.676	
		CB_HC3	6.906	
		CB_HC4	7.685	
		CB_HC5	6.874	7.583
74	Coal Stream	CB_CL1	10.942	
		CB_CL2	11.082	
		CB_CL3	9.597	
		CB_CL4	9.694	
		CB_CL5	9.895	10.242
75	Cust Main Drain @ Skewbridge Rd	CB_CMD1	9.472	

		CB_CMD2	8.744	
		CB_CMD3	9.504	
		CB_CMD5	9.504	9.306
76	Curletts Rd drain	CB_CUR1	7.888	
		CB_CUR2	8.397	
		CB_CUR3	9.329	
		CB_CUR4	7.4	
		CB_CUR5	7.675	8.138
77	Dry Stream	CB_DRY1	9.341	
		CB_DRY2	9.416	
		CB_DRY3	8.671	
		CB_DRY4	7.815	
		CB_DRY5	9.764	9.001
78	Dudley Creek	CB_DUD1	6.321	
		CB_DUD2	6.578	
		CB_DUD3	6.832	
		CB_DUD4	5.112	
		CB_DUD5	8.622	6.693
79	Ealing Spring	CB_EAL1	12.624	
		CB_EAL2	11.003	
		CB_EAL3	10.036	
		CB_EAL4	10.421	
		CB_EAL5	10.597	10.936
80	Fork Stream	CB_FRK1	9.501	
		CB_FRK2	8.739	
		CB_FRK3	9.551	
		CB_FRK4	10.126	9.479
81	Glenfield Stream	CB_GLN1	8.438	
		CB_GLN3	9.202	
		CB_GLN4	9.922	
		CB_GLN5	7.842	8.851
82	Halls Stream	CB_HAL1	8.544	
		CB_HAL2	8.774	
		CB_HAL3	9.08	
		CB_HAL4	8.841	
		CB_HAL5	8.167	8.681
83	Harmans/Opuahou Stream	CB_HRM1	7.652	
		CB_HRM2	9.034	
		CB_HRM3	8.655	
		CB_HRM4	7.963	
		CB_HRM5	9.665	8.594
84	Hurunui R at SH7 bridge	CB_HRN1	10.319	

		CB_HRN2	11.964	
		CB_HRN3	11.75	
		CB_HRN4	10.081	
		CB_HRN5	9.392	10.701
85	Irishman Creek	CB_IRC1	10.245	
		CB_IRC2	8.993	
		CB_IRC3	11.242	
		CB_IRC4	10.817	
		CB_IRC5	11.539	10.567
86	Kowhai River at SH1	CB_KOW1	15.617	
		CB_KOW2	15.254	
		CB_KOW3	13.042	
		CB_KOW4	13.844	
		CB_KOW5	13.494	14.25
87	Kaiapoi River -NIWA fish hatchery	CB_KP1	10.424	
		CB_KP2	8.482	
		CB_KP3	8.325	
		CB_KP4	9.515	
		CB_KP5	8.259	9.001
88	Kaituna Stm	CB_KTN1	12.075	
		CB_KTN2	11.808	
		CB_KTN3	13.004	
		CB_KTN4	12.128	
		CB_KTN5	12.319	12.267
89	Lyell Creek at Mill Rd	CB_LYL2	9.406	
		CB_LYL3	8.119	
		CB_LYL4	9.348	
		CB_LYL5	9.814	9.172
90	Mary Burn	CB_MB1	10.797	
		CB_MB2	10.626	
		CB_MB3	10.581	
		CB_MB4	9.097	10.275
91	Ohapi Creek at Guild Rd	CB_OHP1	8.296	
		CB_OHP2	9.772	
		CB_OHP3	10.465	
		CB_OHP4	9.915	
		CB_OHP5	9.839	9.657
92	Okana River	CB_OKN1	7.806	
		CB_OKN2	7.797	
		CB_OKN3	4.936	
		CB_OKN4	8.101	
		CB_OKN5	8.381	7.404

93	Okuti River	CB_OKU1	10.762	
		CB_OKU2	9.596	
		CB_OKU3	10.017	
		CB_OKU4	9.987	
		CB_OKU5	9.896	10.051
94	Omarama Stream at SH8	CB_OMR1	9.424	
		CB_OMR2	9.27	
		CB_OMR3	8.189	
		CB_OMR4	8.433	
		CB_OMR5	7.905	8.644
95	Opihi at SH1	CB_OPH1	9.47	
		CB_OPH2	10.467	
		CB_OPH3	11.63	
		CB_OPH4	10.116	
		CB_OPH5	10.584	10.453
96	Opuha River below Skiptons bridge	CB_OPU1	9.068	
		CB_OPU2	7.022	
		CB_OPU3	8.439	
		CB_OPU4	8.937	
		CB_OPU5	10.199	8.733
97	Pahau R at SH7	CB_PAH1	11.267	
		CB_PAH2	11.049	
		CB_PAH3	10.849	
		CB_PAH4	9.708	
		CB_PAH5	11.764	10.927
98	Pareora River - Pareora Rd bridge	CB_PAR1	9.401	
		CB_PAR2	10.077	
		CB_PAR3	11.824	
		CB_PAR4	10.932	
		CB_PAR5	11.339	10.715
99	Pawsons Stream	CB_PAW2	9.807	
		CB_PAW3	7.072	
		CB_PAW4	6.734	
		CB_PAW5	7.019	7.658
100	Petries Creek at Canal Rd	CB_PET1	8.746	
		CB_PET2	10.267	
		CB_PET3	7.441	
		CB_PET4	9.964	
		CB_PET5	9.506	9.185
101	Prices Stm	CB_PRS1	9.681	
		CB_PRS2	9.876	
		CB_PRS3	9.195	

		CB_PRS4	9.697	
		CB_PRS5	10.889	9.868
102	Prices tributary	CB_PRT1	7.085	
		CB_PRT2	7.996	
		CB_PRT3	7.498	
		CB_PRT4	8.13	
		CB_PRT5	7.831	7.708
103	Quail Burn	CB_QLB1	8.87	
		CB_QLB2	10.022	
		CB_QLB3	10.211	
		CB_QLB4	9.136	
		CB_QLB5	9.805	9.609
104	Raincliff Stream	CB_RAN1	7.477	
		CB_RAN2	8.925	
		CB_RAN3	8.733	
		CB_RAN4	9.033	8.542
105	Selwyn R @ Whitecliffs Domain	CB_SEL1	11.839	
		CB_SEL2	10.803	
		CB_SEL3	10.255	
		CB_SEL4	11.713	
		CB_SEL5	12.119	11.346
106	School Stm	CB_SKL1	7.498	
		CB_SKL2	8.003	
		CB_SKL3	8.243	
		CB_SKL4	6.45	
		CB_SKL5	10.918	8.222
107	Spring Creek	CB_SPR1	10.928	
		CB_SPR2	11.331	
		CB_SPR3	7.59	
		CB_SPR4	9.284	
		CB_SPR5	10.763	9.979
108	Selwyn Rr at Coe's Ford	CB_SR1	10.234	
		CB_SR2	12.438	
		CB_SR3	10.868	
		CB_SR4	11.051	
		CB_SR5	8.674	10.653
109	Styx River-Styx Mill Reserve	CB_STX1	9.865	
		CB_STX2	10.345	
		CB_STX3	8.763	
		CB_STX4	9.348	
		CB_STX5	12.006	10.066
110	Takamatua Stream	CB_TKM2	9.329	

		CB_TKM3	7.585	
		CB_TKM5	9.753	8.889
111	Taranaki Ck at Preeces Rd bridge	CB_TNK1	7.834	
		CB_TNK2	5.89	
		CB_TNK3	7.361	
		CB_TNK4	8.77	
		CB_TNK5	9.466	7.864
112	Avon-Victoria Square	CB_VIC1	8.553	
		CB_VIC2	8.956	
		CB_VIC3	5.912	
		CB_VIC4	6.991	
		CB_VIC5	7.07	7.496
113	Waikakahi at Glenavy Tawai Rd	CB_WK1	8.607	
		CB_WK2	10.11	
		CB_WK3	8.026	
		CB_WK4	9.099	
		CB_WK5	9.044	8.977
114	Waimari	CB_WMR1	6.256	
		CB_WMR2	8.291	
		CB_WMR3	8.674	
		CB_WMR4	7.043	
		CB_WMR5	7.937	7.64
115	Waipara River @ Laidmore Rd	CB_WPR1	9.523	
		CB_WPR2	10.745	
		CB_WPR3	12.044	
		CB_WPR4	9.133	
		CB_WPR5	10.01	10.291
116	319 Anarua at Skudders Road 39825	HB_ANA1	11.893	
		HB_ANA2	9.776	
		HB_ANA3	11.792	
		HB_ANA4	10.067	
		HB_ANA5	10.423	10.79
117	Ananiwaniwa # 333	HB_ANI1	13.033	
		HB_ANI2	13.271	
		HB_ANI3	10.444	
		HB_ANI4	13.855	
		HB_ANI5	13.507	12.822
118	Esk @ Waipunga # 39811	HB_ESK1	11.85	
		HB_ESK2	12.389	
		HB_ESK3	10.495	
		HB_ESK4	12.052	11.696
119	Hangaroa # 337	HB_HAN1	8.693	

		HB_HAN2	9.472	
		HB_HAN3	9.5	
		HB_HAN4	8.79	9.114
120	Herehere stream at Te Aute	HB_HER1	8.612	
		HB_HER2	7.988	
		HB_HER3	8.243	
		HB_HER4	7.985	
		HB_HER5	8.629	8.292
121	Makaretu SH50 L9	HB_MAK1	11.366	
		HB_MAK2	11.894	
		HB_MAK3	11.008	
		HB_MAK4	10.58	
		HB_MAK5	10.442	11.058
122	Mangaonuka at Tikokino 284	HB_MAN1	9.728	
		HB_MAN2	8.869	
		HB_MAN3	10.389	
		HB_MAN4	10.802	
		HB_MAN5	9.32	9.821
123	Mangakuri 2414	HB_MGK1	9.43	
		HB_MGK2	9.087	
		HB_MGK3	9.48	
		HB_MGK4	8.401	
		HB_MGK5	7.985	8.877
124	Mangatarata	HB_MGT1	9.174	
		HB_MGT2	10.036	
		HB_MGT3	7.459	
		HB_MGT4	12.662	
		HB_MGT5	9.428	9.752
125	Mohaka downstream of Taharua	HB_MKD1	12.903	
		HB_MKD2	11.642	
		HB_MKD3	12.806	
		HB_MKD4	12.366	
		HB_MKD5	14.18	12.779
126	Mokomokonui	HB_MKM1	11.481	
		HB_MKM2	12.227	
		HB_MKM3	11.932	
		HB_MKM4	13.503	
		HB_MKM5	12.676	12.364
127	Mohaka upstream of Taharua	HB_MKU1	12.343	
		HB_MKU2	13.095	
		HB_MKU3	12.443	
		HB_MKU4	10.518	

		HB_MKU5	12.046	12.089
128	Mangarau at Keirunga	HB_MNK1	8.083	
		HB_MNK2	8.297	
		HB_MNK3	8.269	
		HB_MNK4	7.663	
		HB_MNK5	6.969	7.856
129	Mangaone at Rissington site ID 266 / 39883	HB_MNR1	11.246	
		HB_MNR2	12.932	
		HB_MNR3	10.67	
		HB_MNR4	10.931	
		HB_MNR5	11.688	11.493
130	Mangarau at Te Aute Rd	HB_MNT1	7.307	
		HB_MNT2	7.749	
		HB_MNT3	8.128	
		HB_MNT4	7.842	
		HB_MNT5	7.624	7.73
131	Mohaka at Raupunga 39824	HB_MRP1	10.4	
		HB_MRP2	11.136	
		HB_MRP3	11.369	
		HB_MRP4	10.75	
		HB_MRP5	10.276	10.786
132	Mohaka at Willow flat	HB_MWF1	12.727	
		HB_MWF2	13.028	
		HB_MWF3	13.166	
		HB_MWF4	12.089	
		HB_MWF5	11.945	12.591
133	Porangahau 397 at Oruawhara	HB_PGH1	9.678	
		HB_PGH2	9.437	
		HB_PGH3	10.507	
		HB_PGH4	8.529	
		HB_PGH5	8.88	9.406
134	Porangahau at Kate's quarry site 14	HB_POR1	10.734	
		HB_POR2	9.913	
		HB_POR3	11.214	
		HB_POR4	9.806	
		HB_POR5	8.58	10.049
135	Puhokio at Te Apiti	HB_PUH1	10.325	
		HB_PUH2	10.809	
		HB_PUH3	9.755	
		HB_PUH4	9.647	
		HB_PUH5	9.959	10.099
136	Ruahapia @ Showgrounds	HB_RHP1	8.513	

		HB_RHP2	6.698	
		HB_RHP3	6.871	
		HB_RHP4	8.388	
		HB_RHP5	7.386	7.571
137	Ripia upstream Mohaka 604 / 39816	HB_RIP1	11.355	
		HB_RIP2	11.364	
		HB_RIP3	12.223	
		HB_RIP4	11.255	
		HB_RIP5	11.974	11.634
138	Ruatitiri 336	HB_RUA1	10.695	
		HB_RUA2	10.492	
		HB_RUA3	11.012	
		HB_RUA4	11.569	
		HB_RUA5	10.229	10.799
139	Te Iringawhare #341	HB_TIW1	10.485	
		HB_TIW2	10.191	
		HB_TIW3	10.146	
		HB_TIW4	9.663	
		HB_TIW5	10.936	10.284
140	Tukipo SH50 #144	HB_TKP1	12.04	
		HB_TKP2	10.579	
		HB_TKP3	9.824	
		HB_TKP4	10.181	
		HB_TKP5	9.448	10.415
141	Tukituki at SH50 356	HB_TKT1	11.932	
		HB_TKT2	11.79	
		HB_TKT3	12.956	
		HB_TKT4	12.778	
		HB_TKT5	11.585	12.208
142	Taharua at Poronui	HB_TP1	11.336	
		HB_TP2	11.535	
		HB_TP3	12.26	
		HB_TP4	9.798	
		HB_TP5	11.344	11.255
143	Tukituki at Red bridge 407	HB_TRB1	8.762	
		HB_TRB2	9.441	
		HB_TRB3	9.381	
		HB_TRB4	10.3	
		HB_TRB5	10.424	9.662
144	Tukituki at Shagrock 281	HB_TSH1	11.41	
		HB_TSH2	9.693	
		HB_TSH3	9.372	

		HB_TSH4	10.027	
		HB_TSH5	10.98	10.296
145	Tukituki BB15	HB_TUK1	7.828	
		HB_TUK2	9.002	
		HB_TUK3	8.648	
		HB_TUK4	9.048	
		HB_TUK5	7.976	8.5
146	Tutaekuri at Lawrence Hut # 39885	HB_TUT1	13.18	
		HB_TUT2	12.65	
		HB_TUT3	10.645	
		HB_TUT4	13.874	
		HB_TUT5	14.628	12.996
147	Waikaretaheke #1319	HB_WKR1	12.222	
		HB_WKR2	9.617	
		HB_WKR3	14.527	
		HB_WKR4	9.728	
		HB_WKR5	9.172	11.053
148	Waipawa SH50 #280	HB_WP1	9.866	
		HB_WP2	12.26	
		HB_WP3	10.5	
		HB_WP4	9.835	
		HB_WP5	9.816	10.455
149	Brandscombe bridge	HR_BR1	10.95	
		HR_BR2	11.485	
		HR_BR3	10.649	
		HR_BR4	11.391	
		HR_BR5	11.194	11.134
150	Hautapu u/b Rangitiki	HR_HAU3	10.272	10.272
151	Hokio stream at Lake outlet	HR_HOK1	8.814	
		HR_HOK2	8.78	
		HR_HOK3	8.037	
		HR_HOK4	8.392	
		HR_HOK5	8.803	8.565
152	Hautapu at Alabasters	HR_HT2	10.766	
		HR_HT3	9.643	
		HR_HT4	9.537	
		HR_HT5	9.637	9.896
153	Kahutarawa at Johnsons Rata	HR_KH2	11.252	
		HR_KH3	11.305	
		HR_KH4	13.473	
		HR_KH5	12.028	12.015
154	Makotuku u/s Raetihi	HR_MAK1	10.668	

		HR_MAK2	10.725	
		HR_MAK3	11.158	
		HR_MAK4	8.876	
		HR_MAK5	8.876	10.061
155	Mangatainoka at SH2 bridge	HR_MAN1	11.905	
		HR_MAN2	11.349	
		HR_MAN3	9.241	
		HR_MAN4	10.544	
		HR_MAN5	10.419	10.691
156	Mangawhero at Doc HQ	HR_MD1	12.288	
		HR_MD2	12.194	
		HR_MD3	13.297	
		HR_MD4	12.674	
		HR_MD5	13.551	12.801
157	Mangahau at Ballance	HR_MHB1	9.747	
		HR_MHB2	11.794	
		HR_MHB3	10.689	
		HR_MHB4	12.342	
		HR_MHB5	10.557	11.026
158	Makuri at Tuscan Hills	HR_MK1	10.765	
		HR_MK2	11.038	
		HR_MK3	10.38	
		HR_MK4	9.821	
		HR_MK5	12.054	10.812
159	Manawatu at Opiki	HR_MO1	12.67	
		HR_MO2	12.322	
		HR_MO3	11.979	
		HR_MO4	12.554	
		HR_MO5	12.49	12.403
160	Mangatainoka at Putara	HR_MP1	14.486	
		HR_MP2	13.455	
		HR_MP3	13.495	
		HR_MP4	14.754	
		HR_MP5	13.998	14.037
161	Mangapapa at Troup road	HR_MPT1	12.674	
		HR_MPT2	12.485	
		HR_MPT3	12.287	
		HR_MPT4	12.415	12.465
162	Manganui - O-Te Ao at Ashworth bridge	HR_MTA1	10.316	
		HR_MTA2	10.036	
		HR_MTA3	10.326	
		HR_MTA4	9.91	

		HR_MTA5	10.063	10.13
163	Manawatu at Teachers College	HR_MTC1	11.126	
		HR_MTC2	10.54	
		HR_MTC3	11.471	
		HR_MTC4	10.41	
		HR_MTC5	9.256	10.56
164	Manawatu at Upper Gorge	HR_MUG1	9.709	
		HR_MUG2	11.865	
		HR_MUG3	11.657	
		HR_MUG4	9.92	
		HR_MUG5	12.038	11.038
165	Manawatu at Hopelands	HR_MW1	8.977	
		HR_MW2	8.8	
		HR_MW3	9.659	
		HR_MW4	8.545	
		HR_MW5	11.116	9.42
166	Manawatu at Weber	HR_MWB1	9.93	
		HR_MWB2	9.174	
		HR_MWB3	8.298	
		HR_MWB4	9.854	
		HR_MWB5	11.072	9.666
167	Mangawhero at Pakahi Road bridge	HR_MWP1	10.735	
		HR_MWP2	11.063	
		HR_MWP3	10.846	
		HR_MWP4	10.45	
		HR_MWP5	10.295	10.678
168	Manawatu at Whirikino	HR_MWW1	7.062	
		HR_MWW2	8.644	
		HR_MWW3	11.068	
		HR_MWW4	7.97	
		HR_MWW5	6.616	8.272
169	Oroua at Apiti gorge	HR_OAG1	11.483	
		HR_OAG2	12.541	
		HR_OAG3	12.932	
		HR_OAG4	12.387	
		HR_OAG5	14.051	12.679
170	Oroua at Almadale	HR_OAL1	11.518	
		HR_OAL2	11.497	
		HR_OAL3	11.415	
		HR_OAL4	10.331	
		HR_OAL5	11.175	11.187
171	Oroua at SH2	HR_OK1	12.444	

		HR_OK2	11.624	
		HR_OK3	10.592	
		HR_OK4	11.758	11.604
172	Oroua at Awahuri	HR_ORO1	10	
		HR_ORO2	10.371	
		HR_ORO3	10.546	
		HR_ORO4	9.275	
		HR_ORO5	9.83	10.004
173	Pohangina at Piripiri	HR_PHP1	15.007	
		HR_PHP2	12.327	
		HR_PHP3	12.751	
		HR_PHP4	13.361	
		HR_PHP5	14.232	13.535
174	Porewa at Onepuhi	HR_PR1	10.519	
		HR_PR2	10.193	
		HR_PR3	9.444	
		HR_PR4	10.189	
		HR_PR5	10.014	10.072
175	Rangitikei at Pokeokahu	HR_RG1	11.781	
		HR_RG2	12.598	
		HR_RG3	11.401	
		HR_RG4	11.355	
		HR_RG5	11.304	11.688
176	Rangitikei at McKelvies	HR_RM1	12.369	
		HR_RM2	10.748	
		HR_RM3	12.34	
		HR_RM4	11.567	
		HR_RM5	12.367	11.878
177	Rangitikei at Mangaweka	HR_RMW1	12.618	
		HR_RMW2	12.371	
		HR_RMW3	12.989	
		HR_RMW4	10.922	
		HR_RMW5	12.548	12.289
178	Rangitiki at Onepuhi	HR_RO4	11.716	
		HR_RO5	12.495	12.105
179	Tamaki at Reserve	HR_TAM1	13.878	
		HR_TAM2	14.5	
		HR_TAM3	14.646	
		HR_TAM4	14.951	
		HR_TAM5	14.043	14.404
180	Tiraumea at Houkopua reserve	HR_TH1	11.639	
		HR_TH2	12.045	

		HR_TH3	11.594	
		HR_TH4	10.222	
		HR_TH5	11.64	11.428
181	Tiraumea at Ngaturi	HR_TIR1	12.468	
		HR_TIR2	11.801	
		HR_TIR3	11.527	
		HR_TIR4	11.146	
		HR_TIR5	9.613	11.311
182	Tokiahuru u/s Whangaehu	HR_TK1	11.636	
		HR_TK2	12.914	
		HR_TK3	11.807	
		HR_TK4	12.208	
		HR_TK5	11.942	12.101
183	Tokomaru at Horseshoe bend	HR_TKM1	12.698	
		HR_TKM2	11.595	
		HR_TKM3	12.57	
		HR_TKM4	12.661	
		HR_TKM5	11.608	12.226
184	Tamaki at Stephensons	HR_TS1	11.474	
		HR_TS2	11.161	
		HR_TS3	12.646	
		HR_TS4	12.506	
		HR_TS5	12.721	12.101
185	Whanganui at Cherry grove	HR_WC1	9.257	
		HR_WC2	9.852	
		HR_WC3	12.081	
		HR_WC4	9.968	
		HR_WC5	10.944	10.421
186	Whanganui d/s of Retaruke	HR_WG1	10.971	
		HR_WG2	8.641	
		HR_WG3	11.552	
		HR_WG4	9.73	
		HR_WG5	10.534	10.286
187	Whanganui at Piripiri	HR_WH1	9.081	
		HR_WH2	9.705	
		HR_WH3	11.564	
		HR_WH4	9.483	
		HR_WH5	9.64	9.894
188	Whanganui at Te Maire	HR_WT1	9.682	
		HR_WT2	9.164	
		HR_WT3	11.023	
		HR_WT4	8.86	

		HR_WT5	9.996	9.745
189	Borck Creek at 200m downstream of Queen street	TS_BOR1	7.376	
		TS_BOR2	7.426	
		TS_BOR3	7.66	
		TS_BOR4	6.319	
		TS_BOR5	8.47	7.45
190	Jimmy-Lee Creek at 35 Beach Rd	TS_JLB1	8.742	
		TS_JLB2	9.443	
		TS_JLB3	7.742	
		TS_JLB4	11.222	
		TS_JLB5	9.941	9.418
191	Jimmy-Lee creek at upstream of Hill street	TS_JLH1	8.369	
		TS_JLH2	8.194	
		TS_JLH3	9.401	
		TS_JLH4	8.973	
		TS_JLH5	7.635	8.514
192	Jimmy-Lee Creek downstream of Washbourne Gardens	TS_JLW1	6.808	
		TS_JLW2	3.359	
		TS_JLW3	5.727	
		TS_JLW4	6.883	
		TS_JLW5	7.789	6.113
193	Redwood valley stream at upstream of Eves valley stream	TS_RED1	7.912	
		TS_RED2	8.201	
		TS_RED3	8.667	
		TS_RED4	8.727	
		TS_RED5	9.109	8.523
194	Reservoir Creek at downstream of Salisbury	TS_RES1	8.063	
		TS_RES2	9.251	
		TS_RES3	8.559	
		TS_RES4	7.003	
		TS_RES5	8.362	8.248
195	Tasman Valley upstream at upstream of Jester house	TS_TAS1	8.517	
		TS_TAS2	7.774	
		TS_TAS3	8.383	
		TS_TAS4	9.129	
		TS_TAS5	9.322	8.625
196	Reservoir Creek upstream of Marlborough River	TS_RM1	10.651	

		TS_RM2	10.593	
		TS_RM3	8.423	
		TS_RM4	10.21	
		TS_RM5	8.175	9.61
197	RS53 Awhea river	WG_AW1	11.976	
		WG_AW2	11.397	
		WG_AW3	12.017	
		WG_AW4	10.781	
		WG_AW5	11.345	11.503
198	RS49 Beef Creek at headwaters	WG_BC1	14.414	
		WG_BC2	10.402	
		WG_BC3	11.662	
		WG_BC4	13.27	
		WG_BC5	12.48	12.446
199	RS13 Horokiri stream	WG_HOR1	12.602	
		WG_HOR2	10.406	
		WG_HOR3	9.206	
		WG_HOR4	10.301	
		WG_HOR5	10.864	10.676
200	Rs20 Hutt river at Te Marua	WG_HTM1	12.423	
		WG_HTM2	12.03	
		WG_HTM3	12.942	
		WG_HTM4	12.997	
		WG_HTM5	14.405	12.959
201	RS22 Hutt at Boulcott	WG_HUT1	9.672	
		WG_HUT2	11.707	
		WG_HUT3	11.634	
		WG_HUT4	12.153	
		WG_HUT5	11.609	11.355
202	RS18 Karori	WG_KAR1	9.504	
		WG_KAR2	8.341	
		WG_KAR3	8.76	
		WG_KAR4	7.796	
		WG_KAR5	8.562	8.592
203	RS 19 Kaiwharawhara	WG_KWH1	9.106	
		WG_KWH2	9.945	
		WG_KWH3	10.065	
		WG_KWH4	9.482	
		WG_KWH5	8.604	9.44
204	RS24 Mangaroa	WG_MAN1	11.537	
		WG_MAN2	10.408	
		WG_MAN3	11.875	

		WG_MAN4	9.742	
		WG_MAN5	9.312	10.575
205	RS02 Mangapouri at Bennetts road	WG_MGP1	7.903	
		WG_MGP2	8.248	
		WG_MGP3	8.17	
		WG_MGP4	8.619	
		WG_MGP5	7.52	8.092
206	RS50 Mangatarere stream at SH2	WG_MTR1	9.706	
		WG_MTR2	10.883	
		WG_MTR3	8.332	
		WG_MTR4	8.469	
		WG_MTR5	10.564	9.591
207	RS45 Parkvale tributary at lowes reserve	WG_PKT1	10.574	
		WG_PKT2	10.316	
		WG_PKT3	8.753	
		WG_PKT4	8.174	
		WG_PKT5	10.33	9.629
208	RS46 Parkvale stream at Weir	WG_PKW1	8.055	
		WG_PKW2	9.689	
		WG_PKW3	8.694	
		WG_PKW4	7.649	
		WG_PKW5	6.956	8.209
209	RS16 Porirua at Milk depot (or Wall park)	WG_POR1	8.08	
		WG_POR2	9.83	
		WG_POR3	10.922	
		WG_POR4	8	
		WG_POR5	10.049	9.376
210	RS37 Taueru at Gladstone	WG_TR1	6.654	
		WG_TR2	9.094	
		WG_TR3	9.688	
		WG_TR4	9.268	
		WG_TR5	7.86	8.513
211	RS36 Taueru at Castle Hill	WG_TRC1	10.149	
		WG_TRC2	10.93	
		WG_TRC3	9.896	
		WG_TRC4	11.857	
		WG_TRC5	12.054	10.977
212	RS27 Waiwhetu stream	WG_WAI1	6.686	
		WG_WAI2	5.832	
		WG_WAI3	5.714	
		WG_WAI4	6.171	

		WG_WAI5	5.504	5.981
213	RS 47 Waiohine river at Gorge	WG_WG1	14.885	
		WG_WG2	12.685	
		WG_WG3	14.715	
		WG_WG4	14.578	
		WG_WG5	15.012	14.375
214	RS48 Waiohine at Bicknells	WG_WHB1	10.882	
		WG_WHB2	11.721	
		WG_WHB3	11.929	
		WG_WHB4	11.991	
		WG_WHB5	12.232	11.751
215	RS09 Waikanae at Mangaone at Walkway	WG_WKN1	13.932	
		WG_WKN2	14.25	
		WG_WKN3	14.566	
		WG_WKN4	15.029	
		WG_WKN5	13.955	14.347
216	Ahirua stream, Coromandel	WK_AHR1	12.83	
		WK_AHR2	11.677	
		WK_AHR3	11.517	
		WK_AHR4	11.771	
		WK_AHR5	13.438	12.246
217	Bankwood, Danny Park	WK_BKW1	3.651	
		WK_BKW2	6.809	
		WK_BKW4	7.669	
		WK_BKW5	5.389	5.879
218	Gibbons creek, Hamilton	WK_GB1	7.786	
		WK_GB2	7.241	
		WK_GB3	7.199	
		WK_GB4	8.6	7.707
219	Hospital stream, Normandy Ave	WK_HOS1	9.345	
		WK_HOS2	8.456	
		WK_HOS3	8.193	
		WK_HOS4	7.897	
		WK_HOS5	10.424	8.863
220	Hiruwai stream	WK_HW1	10.679	
		WK_HW2	10.332	
		WK_HW3	10.449	
		WK_HW4	11.361	
		WK_HW5	11.51	10.866
221	Kaurianga river, Coromandel	WK_KAU1	10.168	
		WK_KAU2	10.707	
		WK_KAU3	10.229	

		WK_KAU4	10.191	
		WK_KAU5	9.06	10.071
222	Kirikiroa at River road	WK_KIR1	8.144	
		WK_KIR2	8.028	
		WK_KIR3	7.339	
		WK_KIR4	9.047	
		WK_KIR5	7.955	8.103
223	Karaka stream, Coromandel	WK_KRK1	11.166	
		WK_KRK2	11.373	
		WK_KRK3	11.981	
		WK_KRK4	12.471	
		WK_KRK5	12.381	11.875
224	Manurimu stream	WK_MNR1	10.357	
		WK_MNR3	11.247	
		WK_MNR5	11.192	10.932
225	Tributary of Mangatia stream	WK_MSB1	10.248	
		WK_MSB2	9.043	
		WK_MSB3	8.446	
		WK_MSB4	8.984	
		WK_MSB5	9.953	9.335
226	Mangatia stream	WK_MTA1	8.49	
		WK_MTA2	8.845	
		WK_MTA3	8.54	
		WK_MTA4	8.981	
		WK_MTA5	9.468	8.865
227	Mangakotutukutuku TL trib	WK_MTB1	8.397	
		WK_MTB2	10.025	
		WK_MTB4	10.117	
		WK_MTB5	9.814	9.588
228	Mangakotutukutuku TL	WK_MTL1	7.839	
		WK_MTL3	8.706	
		WK_MTL4	8.561	8.369
229	Mangatu, Coromandel	WK_MTU1	12.638	
		WK_MTU2	12.61	
		WK_MTU3	12.562	
		WK_MTU4	11.547	
		WK_MTU5	12.495	12.37
230	Unnamed tributary of Naike stream	WK_NK1	9.623	
		WK_NK2	9.83	
		WK_NK3	11.639	
		WK_NK4	9.628	
		WK_NK5	11.289	10.402

231	Oamaru stream	WK_OAM1	12.315	
		WK_OAM2	13.93	
		WK_OAM3	12.421	
		WK_OAM4	13.162	
		WK_OAM5	12.044	12.774
232	Unnamed tributary of Okupata stream	WK_OKU1	10.193	
		WK_OKU2	10.496	
		WK_OKU3	14.057	
		WK_OKU4	10.392	
		WK_OKU5	11.443	11.316
233	Pirongia west road, Omanuwaituia	WK_OMW1	12.288	
		WK_OMW2	12.012	
		WK_OMW3	14.112	
		WK_OMW4	12.905	
		WK_OMW5	11.264	12.516
234	Mangakotutukutuku stream, peacocks	WK_PCK1	8.409	
		WK_PCK2	8.353	
		WK_PCK3	8.12	
		WK_PCK4	9.858	
		WK_PCK5	10.238	8.995
235	Pohue	WK_PHE1	11.268	
		WK_PHE2	10.004	
		WK_PHE3	12.416	
		WK_PHE4	11.312	
		WK_PHE5	12.002	11.4
236	Mangarika stream, Te tahi road, Pirangita	WK_PIR1	11.319	
		WK_PIR2	12.73	
		WK_PIR3	13.047	
		WK_PIR4	12.837	
		WK_PIR5	13.308	12.648
237	Waikato river-Pukete boat ramp	WK_PKT1	9.436	
		WK_PKT2	9.253	
		WK_PKT3	8.818	
		WK_PKT4	9.751	
		WK_PKT5	10.188	9.489
238	Paraunahi stream Coromandel	WK_PRN1	10.6	
		WK_PRN2	9.724	
		WK_PRN3	9.886	
		WK_PRN4	9.08	
		WK_PRN5	9.528	9.764

239	Waikato river Swarbicks	WK_SWB1	9.709	
		WK_SWB2	10.191	
		WK_SWB3	9.715	
		WK_SWB4	8.12	
		WK_SWB5	10.875	9.722
240	Mangakotutukutuku, Te Anau	WK_TNU1	7.003	
		WK_TNU2	7.673	
		WK_TNU3	7.853	
		WK_TNU5	7.648	7.544
241	Te Rekereke	WK_TRK1	11.794	
		WK_TRK2	11.906	
		WK_TRK3	12.701	
		WK_TRK4	12.905	
		WK_TRK5	12.734	12.408
242	Taraporiki Coromandel	WK_TRP1	10.741	
		WK_TRP2	11.714	
		WK_TRP3	9.61	
		WK_TRP4	9.753	
		WK_TRP5	10.829	10.529
243	Tararu Coromandel	WK_TRU1	10.578	
		WK_TRU2	9.011	
		WK_TRU3	10.54	
		WK_TRU4	11.829	
		WK_TRU5	10.262	10.444
244	Waikato river, Victoria	WK_VIC1	10.005	
		WK_VIC2	ÈÈÈÈÈ	
		WK_VIC3	7.596	
		WK_VIC4	7.71	
		WK_VIC5	7.804	8.218
245	Whangarohi, Coromandel	WK_WGR1	11.26	
		WK_WGR2	10.319	
		WK_WGR3	10.746	
		WK_WGR4	9.603	
		WK_WGR5	10.525	10.491
246	Waikuku (Te kauri)	WK_WK2	12.069	
		WK_WK3	12.811	
		WK_WK4	12.132	
		WK_WK5	10.856	11.967
247	Whakakai, Whataulata	WK_WKK1	13.729	
		WK_WKK2	15.036	
		WK_WKK3	13.955	
		WK_WKK4	11.956	

		WK_WKK5	13.146	13.564
248	Waiomu stream	WK_WMU1	11.029	
		WK_WMU2	10.872	
		WK_WMU3	10.356	
		WK_WMU4	10.945	
		WK_WMU5	10.408	10.722
249	Wainui, Raglan	WK_WN1	11.556	
		WK_WN2	11.747	
		WK_WN3	12.642	
		WK_WN4	11.403	
		WK_WN5	12.633	11.996
250	Unnamed tributary -Waitetuna river	WK_WTT1	11.569	
		WK_WTT2	12.253	
		WK_WTT3	12.713	
		WK_WTT4	12.344	
		WK_WTT5	12.285	12.233
251	Waitawhiriwhiri, Edgecumbe park	WK_WTW1	7.674	
		WK_WTW2	7.533	
		WK_WTW3	8.689	
		WK_WTW4	7.928	
		WK_WTW5	8.218	8.008
252	Waiwawa Coromandel	WK_WW1	10.428	
		WK_WW2	10.369	
		WK_WW3	10.422	
		WK_WW4	10.567	
		WK_WW5	10.742	10.505