

ENVIRONMENT CANTERBURY - WATER QUALITY DATA

Purpose: To provide long term data of selected parameters at selected river sites throughout Canterbury to allow for objective trend monitoring, state of the environment reporting, and for regional water quality modelling.

Field Measurements			
SERVICES PROVIDED	Units	Method	Detection limits
Time (NZST)	hh:mm		-
Temperature	Deg °C	Glass Thermometer, or DO Meter (ProODO or Professional Plus)	0.1
Dissolved Oxygen	mg/L	DO Meter (ProODO or Professional Plus)	0.01
Dissolved Oxygen Saturation	% saturation	DO Meter (ProODO or Professional Plus)	0.1
Salinity	ppt	Salinity Conductivity Temperature Meter (YSI 30) or Professional Plus	0.1
Conductivity (Field)	mS/m	Salinity Conductivity Temperature Meter (YSI 30) or Professional Plus	0.1
Specific Conductance (conductivity at 25 °C)	mS/m @ 25 °C	Salinity Conductivity Temperature Meter (YSI 30) or Professional Plus	0.1
Visual Clarity	cm	Clarity Tube - average of 3 measurements	1
Colour	Munsell	Munsell Cards	-
Periphyton (visible algal cover)	% cover	Visible algal cover	-
Secchi Disk	m	Secchi Disk	0.01
Black Disc	m	Black Disc	0.01
Flow	m3/s or l/s	gauging or recorder	-

Laboratory Measurements						
SERVICES PROVIDED	Ecan Laboratory			Hill Laboratories		
	Units	Method	Detection limits	Units	Method	Detection limits
pH	-	APHA 4500-H B - Meter	-	pH units	APHA 4500-H B - Meter	0.1
Conductivity	mS/m	APHA 2510 B - Meter	0.05	mS/m @ 25 °C	APHA 2510 B - Meter	0.1
Salinity	-	NI - in house		ppt	APHA 2520 B	0.2
Turbidity	NTU	APHA 2130 B - Meter	0.1	NTU	APHA 2130 B - Meter	0.05 or 0.1 (saline)
Total Suspended Solids (TSS)	mg/L	APHA 2540 D - Gravimetric	0.5	g/m3	APHA 2540 D - Gravimetric	3 or 0.5 (2L)
Volatile Suspended Solids (VSS)	mg/L	NI - APHA 2540E	0.5	g/m3	APHA 2540E	3
Fixed Suspended Solids (FSS) (Calculation from TSS & VSS)	mg/L	NI - APHA 2540C	0.5	g/m3	APHA 2540C	10
Total Dissolved Solids (TDS)	mg/L	NI - APHA 2540B	-	g/m3	APHA 2540B	-
Total Solids (TS)	mg/L	NI - APHA 2540B	-	g/m3	APHA 2540B	-
Acidity to pH 8.3	mg CaCO ₃ /L	APHA 2310 B - Titration	2	g CaCO ₃ /m3	APHA 2310 B - Titration	1
Alkalinity as (HCO ₃) or as (CaCO ₃)	mg/L	APHA 2320 B - Titration to pH 4.5	4	g CaCO ₃ /m4	APHA 2320 B - Titration to pH 4.5	1
Free CO ₂ - Calc only (From: Alkalinity & pH)	mg/L	APHA 4500 CO ₂ -D - Calc.	1			
Absorbance 270 & 400nm	AU	APHA 5910 B modified	0.005	AU	Spectrophotometry, 1 cm cell	0.002
Chlorine (residual or free, total combined). Immediate analysis required (within 15 minutes).	mg/L	NI-APHA 4500-Cl F - Titration	0.1			
Total Ammonium Nitrogen (NH ₄ N)	mg/L	APHA 4500-NH ₃ F modified	0.005	g/m3	APHA 4500-NH ₃ F modified	0.01
Nitrate + Nitrite Nitrogen (NNN)	mg/L	APHA 4500-NO ₃ F	0.005	g/m3	APHA 4500-NO ₃ F	0.002
Nitrite Nitrogen (NO ₂ N)	mg/L	APHA 4500-NO ₂ B	0.005	g/m3	APHA 4500-NO ₂ B	0.002
Total Kjeldahl Nitrogen (TKN)	mg/L	APHA 4500 Norg D modified	0.15	g/m3	APHA 4500	0.1
Total Nitrogen (TN)	mg/L	APHA 4500-N C modified	0.08	g/m3	APHA 4500-NO ₃	0.01
Dissolved Inorganic Nitrogen (DIN) (calculation from NH ₃ & NNN)	mg/L	Calc. from individual methods	0.005	g/m3	Calc. from individual methods	0.01
Total Organic Nitrogen (calculation: TKN-NH ₃ or TN-DIN)	mg/L	Calc. from individual methods	0.15	g/m3	Calc. from individual methods	0.01
Dissolved Reactive Phosphorus (DRP)	mg/L	APHA 4500 P B F	0.001	g/m3	APHA 4500 P E	0.002
Total Phosphorus (TP)	mg/L	APHA 4500 P B F	0.008	g/m3	APHA 4500 P B & E	0.004
Faecal Coliforms	cfu/100mL	APHA 9222 D MF	1	cfu/100mL	APHA 9222 D	1
Escherichia coli - (<i>E. coli</i>)	MPN/100mL		1	MPN/100mL	APHA 9223B MPN count using Colilert	1
Escherichia coli - (<i>E. coli</i>) Marine	-	APHA 9223B	-	MPN/100mL	APHA 9223B MPN count using Colilert 18	10
Total Coliforms (TC) & <i>E. coli</i>	MPN/100mL		1	MPN/100mL	APHA 9223B MPN count using Colilert	1
Enterococci (Enterolert)	MPN/100mL	APHA 9230 D	1	MPN/100mL	APHA 9230 D	1
Enterococci (Enterolert) Marine	MPN/100mL	APHA 9230 D	10	MPN/100mL	APHA 9230 D	10
Heterotrophic Plate Count @35°C (HPC)	cfu/mL	APHA 9215 B Pour Plate 35°C	1	cfu/mL	APHA 9215 B Pour Plate 35°C	50
Chemical Oxygen Demand (COD)	mg/L	APHA 5220D modified	9	g O ₂ /m3	APHA 5220D modified	6
Chlorophyll A (phytoplankton)	g/m3	* APHA 10200 H	0.003	g/m3	APHA 10200 (modified)	0.0005
Chlorophyll A (stone)	ug/cm ²	APHA 10300	0.5	ug/cm ²	APHA 10300	0.5
Chlorophyll A (Ethanol)	ug/cm ²	APHA 10300 UV	0.05	ug/cm ²	APHA 10300 UV	0.05
Ash free Dry Wt / Loss on Ignition	%	APHA 2540 G				
Dissolved Oxygen (DO) by Winkler	mg/L	APHA 4500-OC	0.5	g/m3	APHA 4500-OC	0.1
Biological Oxygen Demand (BOD ₅) or (BOD _{5ATU})	mg/L	BE EN 18992-2:1998 / BS 6068-2.64:1998	2	g O ₂ /m3	APHA 5210 B	2
Biological Oxygen Demand (Soluble)	mg/L		2	g O ₂ /m3		2
Total Organic Carbon (TOC)	mg/L	APHA 5310 C	0.2	g/m3	APHA 5310 B	0.5
Dissolved Organic Carbon (DOC)	mg/L		0.2	g/m3		0.5
Fluoride (F)	mg/L		0.2	g/m3	APHA 4500-F C	0.05
Chloride (Cl)	mg/L		0.1	g/m3	APHA 4110 B	0.5
Bromide (Br)	mg/L	APHA 4110 B	0.05	g/m3	APHA 3125 B (Bromine)	0.0053
Nitrate Nitrogen (NO ₃ N)	mg/L		0.1	g/m3	APHA 4110 B	0.05
Ortho- Phosphate - (PO ₄)	mg/L		0.05			
Sulphate - (SO ₄)	mg/L		0.1	g/m3	APHA 4110 B	0.5
Boron	mg/L	NI-ISO 9390	0.03			
Reactive Silica (Rsi)	mg/L	APHA 4500-SiO E	0.01	g/m3	APHA 4500-SiO ₂ F modified	0.1
Calcium, Chromium, Copper	mg/L	APHA 3111 B	Ca=0.1, Cr=0.03, Cu=0.02	g/m3	APHA 3125 B	Ca=0.05, Cr=0.053, Cu=0.053
Iron, Lithium	mg/L	APHA 3111 B	Fe=0.03, Li=0.03	g/m3	APHA 3125 B	Fe=0.021,
Magnesium, Manganese	mg/L	APHA 3111 B	Mg=0.1, Mn=0.01	g/m3	APHA 3125 B	Mn=0.000053
Potassium, Sodium	mg/L	APHA 3111 B	K=0.1, Na=0.5	g/m3	APHA 3125 B	K=0.1, Na=0.5
Strontium, Zinc	mg/L	APHA 3111 B	Sr=0.03, Zn=0.02	g/m3	APHA 3125 B	Zn=0.11
Total Hardness	mg/L	APHA 2340B	1	g/m3	APHA 3125 B	1
Ion Balance	mg/L	APHA 1030 F (calculation)	-			
Arsenic	mg/L	APHA 3113 B (GFAA)	As=0.002, Cr	g/m3	APHA 3125 B	

PROCEDURAL NOTES:

- 1) Water quality sampling is carried out by trained Environment Canterbury Staff
- 2) Field observations are made of time (NZST), water temperature, dissolved oxygen (mg/L and % saturation), pH, conductivity, clarity (m), general weather conditions (wind and rain) stage height, flow.
Periphyton observations are made directly if possible by wading and using underwater viewer.
- 3) Samples are collected in appropriately prepared bottles as determined by the supplying laboratory, sealed air-tight, packed in chilly bins with slicker pads, and dispatched directly to our external provider Laboratory (usually received within a 24 hour period).
- 4) Samples are processed in the Laboratory according to lab procedures

NOTE:

- * Sampling procedures apply to the last 5 years.
- * Prior to 2013 the Environment Canterbury Laboratory analysed surface water samples. As of November 2012, surface water quality samples have been analysed by an external laboratory
- * A 'blank space' or 'n/a' in the raw data usually indicates a missing value unlikely to be recovered.

Missing values may arise from a number of causes, such as site inaccessibility, leaked sample, faulty instrumentation, or from a decision to delete a grossly anomalous value because of suspected contamination or faulty analysis.