Liffey Stream Test Results: Place of test: 2468453E, 5729808N Near North Belt Bridge

Test Date: 12th September 2017 Weather conditions: fine, sunny with little wind.

Test	Excellent/ good	Satisfactory	Unsatisfactory		Results stream	Quality
pH	7.03	6.5 - 8.9	Less than 6.5 or more than 9		7.3	good
Conductivity (µS/cm)	Less than 100	100 - 500	More than 500		228	Satisfactory
Dissolved Oxygen (mg/L)					7.76	Unsatisfactory
Oxygen Saturation (%)	More than 90	80 - 90	Less than 80		74.7%	Unsatisfactory
Nitrate (NO_3-N mg/L)	Less than 0.15	0.15 - 0.5	More than 0.5		2.9	Unsatisfactory Degraded
Phosphate (PO_4 mg/L)*	Less than 0.01	0.01 - 0.03	More than 0.03		0.46	Unsatisfactory Degraded
Turbidity (NTU)	Less than 2	2.5	More than 5			Not recorded
WaterTemperature (°C)					13.7	
Coliforms	See details in the appendix					Not recorded
E.Coli CFUs/100mL (Indicator bacteria for faecal pollution)	Less than 260 (Acceptable)	261-550 (Alert)	Over 550 (Action, inform public, put up signs)			
Salmonella CFUs/100mL			Safe level for swimming is zero			

Conclusions:

Aquatic invertebrates: Only worms and snails were caught (very tolerant of pollution). This has been bad for the last 3 years.

The expected insect larvae have yet to re-colonise the stream after prolonged dry conditions and very low flow earlier this year. No bacteria tests were conducted.

Here is a tiny crustacean that we caught – actual length around 1.5 mm.

Its light colour strongly suggests that it lives underground, because it is easy visible to potential predators such as ducks and fish. See below.

The nitrate concentration was lower than 2016, 2.9 compared with 3.4mg/L but still higher than 2.1 mg/L from 2013. Phosphate was higher, 0.46 compared with 0.42 in 2016, 0.27 in 2015 and 0.22 in 2014 and 0.39 mg/L from 2013. All phosphate readings very high!

Notes and Appendices

Notes: * Ecan gives their results to elemental 'P', to get this from the PO_4 divide the results by 3.07 to make a comparison.

**The *E.coli* counts were graded using the Microbiological Water Quality Guidelines for Marine and Freshwater Recreational Areas, although only one sample was tested. Published in June 2002 by the Ministry for the Environment Manatu Mo Te Taiao PO Box 10-362, Wellington, New Zealand. Updated in June 2003. ISBN: 0-478-24091-0 ME number: 474.This document is available under publications on the Ministry for the Environment's website: www.mfe.govt.nz

E. coli is used as an indicator of contamination of drinking-water by faecal material. The Maximum allowed for *E. coli* is less than 1 *E. coli* in 100 mL of sample. *Drinking-water Standards for New Zealand 2005*. Colony Forming Units (CFUs) correspond to the number of bacteria in the sample. Colonies, made of millions of bacteria, and so visible to the naked eye, are counted. Each colony has grown from one bacterium in the sample when it incubated on a plate containing culture medium.

Box 2:
Surveillance, alert and action levels for freshwater

Acceptable/Green Mode: No single sample greater than *260 E. coli/100 mL*.

- Continue routine (e.g. weekly) monitoring.

Alert/Amber Mode: Single sample greater than *260 E. coli/100 mL*.

- Increase sampling to daily (initial samples will be used to confirm if a problem exists).
- Consult the CAC to assist in identifying possible location of sources of faecal contamination.
- Undertake a sanitary survey, and report on sources of contamination.

Action/Red Mode: Single sample greater than *550 E. coli/100 mL*.

- Increase sampling to daily (initial samples will be used to confirm if a problem exists).
- Consult the CAC to assist in identifying possible location of sources of faecal contamination.
- Undertake a sanitary survey, and report on sources of contamination.
- Erect warning signs.
- Inform public through the media that a public health problem exists.

Notes:

- Colilert™ is the method of choice to enumerate *E. coli* or EPA Method 1103.1, 1985 Membrane Filter Method for *E. coli* (this method gives a result for *E. coli* within 24 hours): USEPA ICR Microbial Laboratory Manual.* This method and the MPN Method for *E. coli*, which is also acceptable (but gives a result in 48 hours), is described in the 20th edition of *Standard Methods for the Examination of Water and Waste Water*, American Public Health Association. These methods must be used to enumerate *E. coli* unless an alternative method is validated to give equivalent results for the waters being tested.
  * USEPA National Centre for Environmental Publications and Information (NCEPI), 11029 Kenwood Road, Cincinnati, OH 45242, USA (Document No. EPA-821-C-97-004).
- Samples to test compliance should be over the bathing season appropriate to that locality (at least 1 November to 31 March) and sampling times should be restricted to between 0800 hours and 1800 hours.

EEC. 1976. Council Directive of 8 December 1975 concerning the quality of bathing water (76/160/EEC). Official Journal of the European Communities. No. L31/1–7. Available at: http://europa.eu.int/water/waterbathing/directiv.html. Documents the EEC bathing water directive. Imperative standards require 95% of fortnightly samples to not exceed 10,000 total coliforms per 100 mL or 2000 faecal coliforms per 100 mL. If inspection shows that other substances may be present, or that water quality has deteriorated, then there should be zero Salmonella per litre and zero enterovirus per 10 litres in 95% of samples (sampling frequency unspecified). Guideline values require 80% of fortnightly samples to not exceed 500 total coliforms per 100 mL or 100 faecal coliforms per 100 mL.