METHOD STATEMENT

Determinand:
Mercury

Matrix:
Effluents and surface waters

Principle of Method:
A digested sample reacts with acidic tin (II) chloride to convert mercury (II) to mercury (0) vapour. The mercury vapour is removed from solution by a stream of argon and passed over a gold trap; the mercury is then detected by atomic fluorescence.

Sampling and Sample Preparation:
All samples for mercury analysis are taken in dedicated 100ml glass mercury bottles containing 1 ml of 0.0167M Potassium Bromate – Bromide/ Ultrapure Hydrochloric acid solution.
Samples are preserved on site at the point of sampling.
Samples for filtered Mercury are filtered on site.

Samples that have been collected and preserved in mercury bottles are stable for up to 1 month from sampling (ISO 5667 – 3:2003).

Interferences:
Free bromine causes a negative interference by interfering with the transfer of mercury vapour. The effect is overcome by ensuring all free bromine vapour is reduced.

Performance of Method:
Range of Application: 1 - 20 ng/l without dilution

Determinand	LOD ng/l	Reporting Limit ng/l	Low Standard		High Standard	
			%RSD	%Bias	%RSD	%Bias
Mercury (Total)	0.8783	1.0	7.66	-3.80	3.05	-3.13
Mercury (filtered)	0.6769	1.0	6.74	2.83	5.72	-0.27

Determinand	%	Effluent		Surface water	
		Low Spike	High Spike	Low Spike	High Spike
Mercury (Total)	RSD	6.98	5.16	6.82	3.57
	Rec.	101.30	99.35	102.48	99.99
Mercury (Filtered)	RSD	5.71	3.74	4.94	4.14
	Rec.	97.26	98.78	98.33	101.44

Uncertainty of Measurement

The reported uncertainty is an expanded uncertainty calculated using a coverage factor of 2, which gives a level of confidence of approximately 95%.

Determinand	Uncertainty of Measurement %
Mercury (Total)	24.00
Mercury(filtered)	10.32

References:

Principles of Instrumental Analysis 6th Edition. Holler, Sloog, Crouch ISBN 0-495-12570-9

Methods for the Examination of Waters and Associated Materials. Mercury in Waters, Effluents, Soils and Sediments etc, additional methods 1985, HMSO. ISBN: 011 7519073.

P S Analytical Instrument Operating Manual: Merlin Plus System Manual. Version 4.0