METHOD STATEMENT

Determinand:
Mercury

Matrix:
Treated and untreated sewage, trade effluents, land and prepared Leachates, surface waters, ground waters and process waters

Untreated sewage is filtered prior to analysis to remove particulates.

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 the mercury detected by atomic fluorescence.

Sampling and Sample Preparation:
All samples for mercury analysis are taken in dedicated 60ml glass mercury bottles containing 0.6ml of 0.1N Bromate/Bromide solution and 0.6ml of 36.5 - 38% Hydrochloric Acid solution.
Samples are preserved on site at the point of sampling.

Samples that have been collected and preserved in mercury bottles are stable for up to 1 month from sampling (ISO 5667 – 3:2024).

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: 0.010 – 0.500 µg/l Hg
Limit of Detection: 0.0071 µg/l Hg
Normal Reporting Level: 0.010 µg/l Hg

Determinand	Low Standard		High Standard	
	%RSD	%Bias	%RSD	%Bias
Mercury	6.51	1.41	4.87	2.27

Total Mercury

Determinand	%	Treated Sewage		Trade effluent (to sewer)		Untreated sewage		Trade effluent (to controlled waters)	
		20%	80%	20%	80%	20%	80%	20%	80%
Mercury	Rec.	98.72	98.25	97.93	97.56	90.46	95.16	92.58	92.1
	RSD	6.63	3.67	4.30	3.10	4.76	3.95	3.1	3.83

Determinand	%	Land Leachate	Prepared leachate	Ground water	Surface water	Process water
		80%	80%	80%	80%	80%
Mercury	Rec.	97.91	98.11	98.64	97.27	98.10
	RSD	3.15	1.84	2.49	3.71	2.55

METHOD STATEMENT

Samples and spiked samples – Filtered Mercury

Determinand	%	Ground Water	Surface Water
		80%	80%
Mercury	Rec	96.82	98.96
	RSD	3.97	5.18

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	14.82

References:

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. Part No. M023M055. April 1992.

BS EN ISO 5667 – 3:2024.