METHOD STATEMENT

Determinand:
Colour Scan

Matrix:
Leachates, effluents and waste waters

Principle of Method:
The sample is filtered through a 0.45µm filter prior to scanning at selected wavelengths between 400 and 800nm at 50nm intervals. For highly coloured samples above the linear range of the spectrophotometer, colour scan on a ten-fold dilution can be requested.

Sampling and Sample Preparation:
Samples should be stored at room temperature and analysed as soon as possible. If samples have been refrigerated, analysis must not be started until a room temperature is attained.

Samples are stable for 30 days (In-House Data) from sampling.

Interferences:
Finely divided suspended matter interferes in the measurement and must be removed by filtration prior to analysis.

Performance of Method:

Determinand	LOD	Normal Reporting Level	Range of Application
Colour @ 800nm	0.0030	0.005	0.005- 2.000
Colour @ 750nm	0.0038	0.005	0.005- 2.000
Colour @ 700nm	0.0028	0.005	0.005- 2.000
Colour @ 650nm	0.0022	0.005	0.005- 2.000
Colour @ 600nm	0.0018	0.005	0.005- 2.000
Colour @ 550nm	0.0019	0.005	0.005- 2.000
Colour @ 500nm	0.0018	0.005	0.005- 2.000
Colour @ 450nm	0.0017	0.005	0.005- 2.000
Colour @ 400nm	0.0044	0.005	0.005- 2.000

Determinand	MCERTS Accreditation	Low standard		High Standard	
		Mean (Abs)	RSD %	Mean (Abs)	RSD %
Colour @ 800nm	✓	0.544	0.81	1.202	0.69
Colour @ 750nm	✓	0.455	0.82	0.989	0.65
Colour @ 700nm	✓	0.604	0.71	1.347	1.08
Colour @ 650nm	✓	0.266	0.76	0.572	1.14
Colour @ 600nm	✓	0.102	1.52	0.213	1.81
Colour @ 550nm	✓	0.209	1.11	0.435	1.40
Colour @ 500nm	✓	0.491	0.63	0.995	0.87
Colour @ 450nm	✓	0.380	1.08	0.763	1.14
Colour @ 400nm	✓	0.731	2.28	1.484	1.68

20% Low Spike

Determinand	Strensham WTW Trade Effluent		Finham STW Final Effluent		Nuneaton STW Final Effluent	
	%RSD	% Bias	%RSD	% Bias	%RSD	% Bias
Colour @ 800nm	3.89	0.50	0.85	-0.48	0.78	-0.21
Colour @ 750nm	0.53	-0.28	0.87	-0.47	0.75	-0.19
Colour @ 700nm	0.99	0.35	0.68	0.37	0.60	0.11
Colour @ 650nm	1.01	0.62	0.81	0.24	0.69	-0.13
Colour @ 600nm	1.88	1.23	1.57	-0.06	1.48	-0.71
Colour @ 550nm	1.65	0.34	1.28	-0.35	1.13	-0.02
Colour @ 500nm	0.99	0.18	0.62	-0.14	0.57	0.17
Colour @ 450nm	1.10	-0.15	1.03	-0.78	0.99	-0.41
Colour @ 400nm	1.83	-0.85	1.51	-1.42	1.50	-1.29

80% High Spike

Determinand	Strensham WTW Trade Effluent		Finham STW Final Effluent		Nuneaton STW Final Effluent	
	%RSD	% Bias	%RSD	% Bias	%RSD	% Bias
Colour @ 800nm	0.98	0.31	0.63	0.45	0.56	0.15
Colour @ 750nm	0.96	0.26	0.62	0.38	0.52	0.09
Colour @ 700nm	0.74	0.35	0.71	0.78	0.99	0.30
Colour @ 650nm	0.77	0.18	0.82	0.38	1.09	-0.01
Colour @ 600nm	1.09	0.16	1.08	-0.16	1.63	-0.23
Colour @ 550nm	0.93	0.34	0.86	0.11	1.23	0.34
Colour @ 500nm	0.57	0.56	0.52	0.56	0.82	0.62
Colour @ 450nm	0.96	0.37	0.98	0.40	1.24	0.56
Colour @ 400nm	1.38	0.46	1.26	0.77	1.45	0.68

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 %
Colour @ 800nm	3.39
Colour @ 750nm	3.31
Colour @ 700nm	3.35
Colour @ 650nm	3.48
Colour @ 600nm	4.93
Colour @ 550nm	3.92
Colour @ 500nm	3.37
Colour @ 450nm	3.79
Colour @ 400nm	4.46

References:
Shimadzu 1601 Operating Manual