WAGENINGEN EVALUATING PROGRAMS

FOR ANALYTICAL LABORATORIES

Certificate of Analysis

International Sediment Exchange for Tests on Organic Contaminants

REFERENCE MATERIAL

SETOC sample 716

WAGENINGEN
UNIVERSITY & RESEARCH

Certificate of Analysis SETOC 716

General Information

In this report an overview is given of analytical data for this sample collected in our proficiency testing program. The consensus values are calculated using a robust statistical model. With this NDA model, the mean and standard deviation are calculated using all reported data when at least 4 results are left after removal of reported 'lower than' (<) and 0 (= zero) values. No outliers are removed.

This report is divided into two sections: Consensus Values and Indicative Values. The division is made on the reliability of the data. Consensus Values are based on at least 8 results and a maximum relative uncertainty of 6.25%. Indicative Values are based on a maximum relative uncertainty of 35% and a minimum of 4 and maximum of 7 results, or a relative uncertainty greater than 6.25% when there are at least 8 results.

For each determinand the following parameters are given: mean, standard deviation, coefficient of variation, number of results, median, MAD (Median of Absolute Deviation), the uncertainty of the mean (consensus or indicative) value and the relative uncertainty.

All values, expressed on a weight basis (kg or %), are reported as oven-dried (105°C) material. Moisture is reported in the material as received.

Sample information

WEPAL reference materials are from natural sources only. There is no spiking, mixing or other alterations of the samples. For sample preparation, the SETOC samples are dried at 40°C and milled to pass a 0.5 mm sieve.

This SETOC sample 716 of Sediment, from Netherlands, is prepared for the WEPAL proficiency programs. The sample has been used in 2 periods (or rounds). The results on which the values in this report are based were taken from the periods given in the following table:

Year	Round	Number
1995	3	3
1994	2	2

Consensus Values SETOC 716

Method: Polycyclic aromatic hydrocarbons

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
phenanthrene	µg/kg	108	41.0	38.0	96	110	25.0	5.23	4.85
fluoranthene	µg/kg	254	65.7	25.9	100	255	40.5	8.21	3.24
pyrene	µg/kg	215	60.4	28.1	94	214	36.5	7.78	3.62
chrysene	µg/kg	124	40.2	32.4	94	130	24.5	5.18	4.17
benz(a)anthracene	µg/kg	115	38.1	33.3	94	114	23.5	4.92	4.29
benzo(b)fluoranthene	µg/kg	200	75.2	37.7	93	200	50.0	9.75	4.88
benzo(k)fluoranthene	µg/kg	91.7	21.4	23.4	93	94.5	14.5	2.78	3.03
benzo(a)pyrene	µg/kg	134	42.4	31.6	97	133	27.0	5.38	4.02
indeno(1,2,3-cd)pyrene	µg/kg	134	53.6	40.0	88	139	31.0	7.15	5.33
benzo(ghi)perylene	µg/kg	108	41.3	38.2	92	110	27.0	5.38	4.98

Method: Other parameters

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Particles < 2 µm	%	16.8	1.98	11.7	17	16.8	1.00	0.599	3.56

Method: Metals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
As	mg/kg	15.2	1.92	12.6	44	15.5	1.46	0.363	2.38
Cd	mg/kg	1.32	0.219	16.6	50	1.38	0.135	0.039	2.93
Cr	mg/kg	51.1	7.13	13.9	49	51.0	4.70	1.27	2.49
Cu	mg/kg	22.9	2.03	8.9	50	23.0	1.07	0.359	1.57
Hg	mg/kg	0.378	0.083	21.8	43	0.380	0.050	0.016	4.16
Ni	mg/kg	17.3	2.16	12.5	49	17.2	1.33	0.386	2.23
Pb	mg/kg	43.1	5.62	13.0	50	43.0	3.25	0.993	2.30
Zn	mg/kg	159	13.6	8.5	50	160	9.35	2.41	1.51

Indicative Values SETOC 716

Method: Polycyclic aromatic hydrocarbons

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
naphthalene	µg/kg	40.1	29.5	73.6	54	50.0	20.0	5.02	12.5
acenaphthylene	µg/kg	6.58	8.68	132.1	18	16.5	11.1	2.56	38.9
acenaphthene	µg/kg	13.2	10.6	80.5	40	19.0	8.50	2.09	15.9
fluorene	µg/kg	23.0	12.5	54.4	61	24.0	7.00	2.01	8.71
anthracene	µg/kg	34.7	16.1	46.3	82	33.5	10.9	2.22	6.40
dibenz(ah)anthracene	µg/kg	28.2	18.9	66.9	58	30.5	11.5	3.09	11.0

Method: Polychlorobiphenyls

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
PCB 028	µg/kg	0.665	0.452	68.0	26	1.00	0.400	0.111	16.7
PCB 052	µg/kg	1.49	0.889	59.7	34	1.95	0.495	0.191	12.8
PCB 101	µg/kg	3.51	1.60	45.7	48	3.70	1.28	0.290	8.25
PCB 118	µg/kg	2.28	1.02	44.5	31	2.40	0.600	0.228	9.99
PCB 128	µg/kg	0.831	0.290	34.9	5	0.900	0.150	0.162	19.5
PCB 138	µg/kg	5.20	2.39	46.0	50	5.61	1.61	0.423	8.13
PCB 149	µg/kg	4.47	1.63	36.6	6	4.41	1.50	0.834	18.7
PCB 153	µg/kg	5.19	2.13	41.1	51	5.00	1.40	0.373	7.19
PCB 180	µg/kg	3.25	1.42	43.7	50	3.40	1.06	0.251	7.72

Method: Organochlorine pesticides

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
p,p`-DDT	µg/kg	0.831	0.577	69.4	7	1.00	0.370	0.273	32.8
p,p`-DDE	µg/kg	1.09	0.661	60.4	19	1.70	0.300	0.189	17.3
p,p`-DDD	µg/kg	0.574	0.461	80.3	10	1.38	0.400	0.182	31.7

Method: Other parameters

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
AOX	mg/kg	58.9	12.1	20.5	14	59.9	8.00	4.03	6.84
EOX	mg/kg	0.629	0.305	48.5	46	0.685	0.190	0.056	8.94
Organic carbon	g/kg	16.8	5.54	33.0	10	17.3	3.15	2.19	13.0
Inorganic carbon	g/kg	25.1	2.20	8.7	4	25.2	1.00	1.37	5.47
Particles < 63 µm	%	60.8	10.7	17.5	10	60.8	6.00	4.22	6.93
CN - Total	mg/kg	0.701	0.360	51.3	11	0.800	0.200	0.136	19.3