



**WAGENINGEN EVALUATING PROGRAMS
FOR ANALYTICAL LABORATORIES**

Certificate of Analysis



International Sediment Exchange for Tests on Organic Contaminants

REFERENCE MATERIAL

SETOC sample 717



Certificate of Analysis SETOC 717

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 717 of Marine Sediment, from Netherlands, is prepared for the WEPAL proficiency programs. The sample has been used in 3 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
1998	1	2
1996	3	3
1994	3	2



Consensus Values SETOC 717



Method: Polycyclic aromatic hydrocarbons

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
fluorene	µg/kg	28.0	13.6	48.5	107	30.0	9.00	1.64	5.86
phenanthrene	µg/kg	131	42.1	32.1	159	131	24.0	4.18	3.18
anthracene	µg/kg	44.8	19.6	43.7	137	45.5	11.5	2.09	4.67
fluoranthene	µg/kg	283	71.5	25.3	167	290	45.0	6.92	2.44
pyrene	µg/kg	229	64.4	28.1	157	221	44.6	6.43	2.80
chrysene	µg/kg	124	43.0	34.5	159	129	29.0	4.26	3.42
benz(a)anthracene	µg/kg	128	39.4	30.9	160	130	22.0	3.90	3.05
benzo(b)fluoranthene	µg/kg	199	58.5	29.5	156	200	37.5	5.86	2.95
benzo(k)fluoranthene	µg/kg	90.4	23.7	26.3	151	90.0	14.0	2.42	2.67
benzo(a)pyrene	µg/kg	125	40.5	32.4	161	128	24.0	3.99	3.19
dibenz(ah)anthracene	µg/kg	27.5	13.8	50.0	119	30.0	10.0	1.58	5.73
indeno(1,2,3-cd)pyrene	µg/kg	129	44.2	34.1	149	130	30.0	4.52	3.50
benzo(ghi)perylene	µg/kg	113	36.5	32.3	153	119	21.0	3.69	3.26

Method: Polychlorobiphenyls

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
PCB 101	µg/kg	3.55	1.46	41.2	79	3.59	0.910	0.206	5.80
PCB 118	µg/kg	2.64	1.01	38.3	61	2.80	0.800	0.162	6.13
PCB 138	µg/kg	4.61	1.74	37.8	84	4.80	1.05	0.238	5.16
PCB 153	µg/kg	4.91	1.78	36.3	85	5.00	1.10	0.242	4.93
PCB 180	µg/kg	2.95	1.08	36.6	81	3.00	0.700	0.150	5.09

Method: Other parameters

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
AOX	mg/kg	41.1	8.42	20.5	18	40.1	4.42	2.48	6.05
Particles < 2 µm	%	9.99	2.11	21.1	25	10.0	1.00	0.526	5.27
Particles < 63 µm	%	38.2	5.31	13.9	12	38.5	3.80	1.92	5.02

Method: Metals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
As	mg/kg	15.7	2.03	13.0	84	15.7	1.37	0.277	1.77
Cd	mg/kg	1.77	0.205	11.6	94	1.79	0.115	0.026	1.50
Cr	mg/kg	47.3	8.13	17.2	94	47.1	4.90	1.05	2.22
Cu	mg/kg	19.8	2.06	10.4	93	19.9	1.10	0.267	1.35
Hg	mg/kg	0.441	0.080	18.0	80	0.450	0.050	0.011	2.52
Ni	mg/kg	13.0	1.88	14.5	94	13.0	1.05	0.243	1.87
Pb	mg/kg	36.6	4.22	11.6	95	36.8	2.20	0.542	1.48



Consensus Values SETOC 717



Method: Metals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Zn	mg/kg	135	12.7	9.4	95	134	7.00	1.63	1.21

(cont.)



Indicative Values SETOC 717

Method: Polycyclic aromatic hydrocarbons

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
naphthalene	µg/kg	55.2	35.8	64.7	109	60.0	23.0	4.28	7.75
acenaphthylene	µg/kg	10.6	13.9	130.6	39	16.0	11.8	2.78	26.1
acenaphthene	µg/kg	17.2	11.5	66.8	76	21.5	6.64	1.65	9.57

Method: Polychlorobiphenyls

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
PCB 028	µg/kg	1.42	0.841	59.3	54	1.80	0.690	0.143	10.1
PCB 052	µg/kg	2.16	1.11	51.5	65	2.34	0.660	0.173	7.98
PCB 105	µg/kg	0.644	0.289	44.9	7	0.650	0.210	0.137	21.2
PCB 128	µg/kg	0.722	0.115	16.0	5	0.730	0.030	0.065	8.94
PCB 149	µg/kg	3.04	2.10	68.9	9	3.20	0.920	0.873	28.7

Method: Organochlorine pesticides

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
hexachlorobenzene	µg/kg	0.647	0.409	63.2	22	1.18	0.315	0.109	16.8
pentachlorobenzene	µg/kg	0.373	0.166	44.4	4	0.455	0.080	0.104	27.7
beta-HCH	µg/kg	0.511	0.337	66.0	7	3.20	1.30	0.159	31.2
dieldrin	µg/kg	0.480	0.294	61.4	7	2.00	0.530	0.139	29.0
p,p'-DDT	µg/kg	0.508	0.365	72.0	9	3.00	1.80	0.152	30.0
p,p'-DDE	µg/kg	1.16	0.652	56.1	33	1.41	0.410	0.142	12.2
o,p'-DDE	µg/kg	0.490	0.319	65.1	6	1.45	0.710	0.163	33.2
p,p'-DDD	µg/kg	1.79	0.813	45.3	34	2.00	0.500	0.174	9.71
o,p'-DDD	µg/kg	0.510	0.385	75.6	10	1.75	0.955	0.152	29.9

Method: Other parameters

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Mineral oil, IR	mg/kg	105	31.4	29.9	15	108	21.0	10.1	9.64
Mineral oil, GC	mg/kg	122	34.5	28.4	14	125	15.5	11.5	9.48
EOX	mg/kg	0.440	0.195	44.3	72	0.465	0.135	0.029	6.53
Organic carbon	g/kg	14.4	5.65	39.2	15	14.0	4.00	1.82	12.7
Inorganic carbon	g/kg	11.6	5.32	45.8	7	12.0	2.00	2.51	21.6
CN - Total	mg/kg	0.189	0.202	107.1	14	0.225	0.125	0.068	35.8