



**WAGENINGEN EVALUATING PROGRAMS
FOR ANALYTICAL LABORATORIES**

Certificate of Analysis



International Sediment Exchange for Tests on Organic Contaminants

REFERENCE MATERIAL

SETOC sample 790



Certificate of Analysis SETOC 790

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.

Please note: Most WEPAL-QUASIMEME reference materials are found to be stable over the long term (>10 years) for most determinand/matrix combinations. There are a few exceptions known to us as being less stable over the long term. These are organotins in sediment (MS6), ASP in shellfish (BT7), some PAHs and PCBs in sediment (SETOC) and N-NH₄ (as N) in clay soils (ISE).

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 790 of Sediment, from Netherlands, is prepared for the WEPAL proficiency programs. The sample has been used in 7 periods (or rounds). Only results from the last 5 periods are used. This way, the consensus values reflect the latest 'state of the art' analytical techniques used by the laboratories. The results on which the values in this report are based were taken from the periods given in the following table:

Year	Round	Number
2025	4	1
2023	2	4
2020	3	3
2017	3	2
2015	2	4



Consensus Values SETOC 790

Method: Polycyclic aromatic hydrocarbons

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
acenaphthene	µg/kg	11.0	4.86	44.1	80	12.7	3.38	0.679	6.16
fluorene	µg/kg	16.0	7.32	45.9	89	16.9	5.12	0.970	6.08
phenanthrene	µg/kg	171	43.5	25.4	148	170	27.0	4.47	2.61
anthracene	µg/kg	28.0	9.85	35.2	118	29.2	6.50	1.13	4.05
fluoranthene	µg/kg	311	69.8	22.4	146	317	45.3	7.22	2.32
pyrene	µg/kg	234	57.7	24.7	125	238	37.0	6.45	2.76
chrysene	µg/kg	155	38.9	25.1	145	157	26.6	4.04	2.61
benz(a)anthracene	µg/kg	142	36.2	25.5	146	145	23.0	3.75	2.64
benzo(b)fluoranthene	µg/kg	175	51.9	29.6	116	179	32.6	6.03	3.44
benzo(k)fluoranthene	µg/kg	80.1	20.3	25.3	140	83.2	13.2	2.14	2.68
benzo(a)pyrene	µg/kg	134	34.9	26.1	146	138	22.6	3.61	2.70
dibenz(ah)anthracene	µg/kg	28.5	10.2	35.8	108	29.9	5.95	1.23	4.31
indeno(1,2,3-cd)pyrene	µg/kg	110	27.8	25.4	142	110	18.2	2.92	2.66
benzo(ghi)perylene	µg/kg	109	24.9	22.8	142	111	15.9	2.61	2.39
EPA ΣPAH(16)	µg/kg	1736	409	23.6	67	1781	222	62.5	3.60

Method: Polychlorobiphenyls

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
PCB 153	µg/kg	1.44	0.656	45.4	84	1.57	0.435	0.089	6.20

Method: Organochlorine pesticides

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
dieldrin	µg/kg	0.530	0.088	16.6	13	0.551	0.036	0.030	5.74

Method: Other parameters

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Mineral oil, GC	mg/kg	58.5	27.9	47.6	101	64.9	19.9	3.46	5.92
Organic carbon	g/kg	26.7	2.68	10.0	63	26.6	1.58	0.422	1.58
Particles > 63 µm	%	74.7	4.98	6.7	9	76.1	2.72	2.07	2.77

Method: Metals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
As	mg/kg	23.7	2.38	10.0	58	23.6	1.50	0.390	1.64
Cd	mg/kg	7.13	0.691	9.7	61	7.10	0.489	0.111	1.55
Cr	mg/kg	20.4	4.14	20.3	60	21.4	3.25	0.668	3.28
Cu	mg/kg	48.2	6.03	12.5	60	48.4	3.78	0.973	2.02
Hg	mg/kg	0.182	0.022	12.1	54	0.184	0.014	0.004	2.06



Consensus Values SETOC 790

Method: Metals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Ni	mg/kg	11.4	1.41	12.4	61	11.6	1.00	0.226	1.98
Pb	mg/kg	72.1	7.12	9.9	62	73.0	4.38	1.13	1.57
Zn	mg/kg	276	29.4	10.7	61	277	15.6	4.70	1.71
Ba	mg/kg	221	21.1	9.5	44	222	11.6	3.98	1.80
Co	mg/kg	7.10	0.604	8.5	50	7.08	0.295	0.107	1.51
Mo	mg/kg	3.81	0.530	13.9	43	3.77	0.365	0.101	2.65

(cont.)

Indicative Values SETOC 790

Method: Polycyclic aromatic hydrocarbons

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
naphthalene	µg/kg	17.7	9.61	54.3	85	21.6	6.50	1.30	7.36
acenaphthylene	µg/kg	9.90	7.27	73.4	73	11.5	5.51	1.06	10.7

Method: Polychlorobiphenyls

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
PCB 028	µg/kg	0.425	0.377	88.8	40	0.443	0.249	0.075	17.6
PCB 031	µg/kg	0.196	0.078	39.9	4	0.190	0.037	0.049	24.9
PCB 052	µg/kg	0.458	0.296	64.7	39	0.582	0.213	0.059	13.0
PCB 101	µg/kg	0.990	0.469	47.4	62	1.08	0.290	0.074	7.53
PCB 105	µg/kg	0.211	0.215	101.8	8	0.239	0.100	0.095	45.0
PCB 118	µg/kg	0.522	0.296	56.7	45	0.582	0.153	0.055	10.6
PCB 128	µg/kg	0.290	0.130	44.9	4	0.347	0.050	0.081	28.1
PCB 138	µg/kg	1.38	0.689	49.9	83	1.60	0.500	0.094	6.84
PCB 149	µg/kg	1.27	0.243	19.1	7	1.34	0.140	0.115	9.04
PCB 156	µg/kg	0.203	0.069	34.1	5	0.220	0.040	0.039	19.0
PCB 180	µg/kg	0.931	0.600	64.4	67	1.30	0.450	0.092	9.84
ΣPCB(7)	µg/kg	6.01	2.22	36.9	26	6.65	1.31	0.544	9.06

Method: Organochlorine pesticides

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
hexachlorobenzene	µg/kg	0.472	0.391	82.9	9	0.579	0.251	0.163	34.5
1,2,4 trichlorobenzene	µg/kg	0.206	0.054	26.3	4	0.220	0.029	0.034	16.4
p,p'-DDT	µg/kg	0.800	0.465	58.2	21	0.777	0.288	0.127	15.9
p,p'-DDE	µg/kg	0.985	0.294	29.9	28	0.937	0.170	0.069	7.06
p,p'-DDD	µg/kg	0.894	0.339	37.9	24	0.865	0.243	0.086	9.68
o,p'-DDD	µg/kg	0.303	0.206	68.0	6	0.329	0.150	0.105	34.7

Method: Other parameters

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
EOX	mg/kg	0.234	0.124	53.1	13	0.243	0.065	0.043	18.4
Inorganic carbon	g/kg	1.40	0.461	32.8	11	1.40	0.300	0.174	12.4
Particles < 2 µm	%	6.77	4.61	68.2	11	6.54	2.54	1.74	25.7
Particles < 63 µm	%	19.6	4.42	22.5	15	19.7	3.68	1.43	7.26
CN - Total	mg/kg	0.852	0.338	39.6	23	1.04	0.218	0.088	10.3
CN - Free	mg/kg	0.567	0.129	22.8	4	0.597	0.055	0.081	14.2



Indicative Values SETOC 790

Method: Metals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Sb	mg/kg	1.62	0.185	11.4	6	1.64	0.091	0.094	5.80
Sn	mg/kg	5.22	0.647	12.4	7	5.12	0.411	0.305	5.86
V	mg/kg	20.1	3.96	19.7	7	20.5	2.65	1.87	9.30

Method: Brominated Flame Retardants

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
BDE 099	ng/kg	134	38.2	28.6	5	121	18.9	21.4	16.0