



WEPAI-QUASIMEME

Certificate of Analysis



International Sediment Exchange for Tests on Organic Contaminants

REFERENCE MATERIAL

SETOC sample 793

2026-Jul-30



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 measurand 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 measurand/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) & N-NO₃ (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 793 of Marine Sediment, from Netherlands, is prepared for the WEPAL proficiency programs. The sample has been used in 5 rounds. The results on which the values in this report are based were taken from the rounds given in the following table:

Year	Round	Number
2026	2	2
2022	2	3
2019	2	2
2016	2	4
2013	1	2



Consensus Values SETOC 793



Method: Polycyclic aromatic hydrocarbons

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
naphthalene	µg/kg	86.0	39.6	46.1	135	91.9	28.1	4.26	4.96
acenaphthylene	µg/kg	25.0	11.7	46.9	104	25.3	7.75	1.44	5.74
acenaphthene	µg/kg	20.3	6.80	33.5	94	22.0	4.21	0.877	4.31
fluorene	µg/kg	37.8	12.5	33.2	108	39.0	8.99	1.51	3.99
phenanthrene	µg/kg	247	52.9	21.4	157	250	34.0	5.28	2.13
anthracene	µg/kg	71.4	21.4	29.9	146	71.2	13.0	2.21	3.10
fluoranthene	µg/kg	449	63.9	14.2	157	453	36.1	6.37	1.42
pyrene	µg/kg	376	68.8	18.3	130	379	41.0	7.55	2.01
chrysene	µg/kg	279	63.8	22.9	154	284	42.7	6.43	2.30
benz(a)anthracene	µg/kg	223	44.2	19.9	155	227	27.0	4.44	1.99
benzo(b)fluoranthene	µg/kg	341	89.8	26.4	120	341	60.9	10.2	3.01
benzo(k)fluoranthene	µg/kg	149	32.0	21.5	154	152	19.0	3.23	2.16
benzo(a)pyrene	µg/kg	208	45.5	21.8	158	210	29.0	4.52	2.17
dibenz(ah)anthracene	µg/kg	50.3	16.0	31.7	117	52.1	10.1	1.84	3.66
indeno(1,2,3-cd)pyrene	µg/kg	205	54.6	26.6	156	205	33.2	5.46	2.67
benzo(ghi)perylene	µg/kg	203	37.6	18.5	155	205	23.9	3.77	1.86
EPA ΣPAH(16)	µg/kg	3041	667	21.9	62	3062	426	106	3.48

Method: Polychlorobiphenyls

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
PCB 028	µg/kg	4.27	1.50	35.2	117	4.20	0.820	0.174	4.07
PCB 052	µg/kg	3.79	1.24	32.8	129	3.84	0.840	0.137	3.61
PCB 101	µg/kg	6.47	1.55	23.9	131	6.33	0.970	0.169	2.61
PCB 118	µg/kg	3.91	0.838	21.4	121	4.00	0.497	0.095	2.43
PCB 138	µg/kg	9.02	2.70	30.0	132	9.00	1.61	0.294	3.26
PCB 153	µg/kg	10.4	2.44	23.5	133	10.5	1.50	0.265	2.55
PCB 180	µg/kg	6.64	1.70	25.5	132	6.73	0.995	0.184	2.78
ΣPCB(7)	µg/kg	45.8	8.54	18.6	49	46.2	4.70	1.53	3.33

Method: Organochlorine pesticides

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
hexachlorobenzene	µg/kg	3.17	0.826	26.1	41	3.20	0.605	0.161	5.09
p,p'-DDE	µg/kg	1.70	0.368	21.6	34	1.74	0.212	0.079	4.63



Consensus Values SETOC 793

Method: Other parameters

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Mineral oil, GC	mg/kg	446	102	22.8	115	444	68.0	11.9	2.66
Organic carbon	g/kg	39.0	4.63	11.9	62	39.0	2.52	0.735	1.88

Method: Metals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
As	mg/kg	18.9	2.22	11.8	70	19.0	1.50	0.332	1.76
Cd	mg/kg	1.50	0.174	11.6	72	1.51	0.096	0.026	1.71
Cr	mg/kg	67.8	13.5	19.9	73	68.5	9.07	1.97	2.91
Cu	mg/kg	63.2	6.38	10.1	74	63.6	3.84	0.927	1.47
Hg	mg/kg	0.561	0.073	12.9	75	0.560	0.047	0.010	1.87
Ni	mg/kg	40.0	4.28	10.7	74	40.0	2.95	0.622	1.56
Pb	mg/kg	72.3	9.20	12.7	74	73.1	5.47	1.34	1.85
Zn	mg/kg	352	29.7	8.4	75	352	18.3	4.29	1.22
Ba	mg/kg	175	31.0	17.7	48	175	18.9	5.60	3.19
Co	mg/kg	13.4	1.08	8.0	56	13.4	0.719	0.180	1.34
Mo	mg/kg	1.03	0.203	19.7	36	1.03	0.125	0.042	4.11

Indicative Values SETOC 793

Method: Polycyclic aromatic hydrocarbons

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
VROM Σ PAH10	$\mu\text{g/kg}$	2067	177	8.5	5	2065	112	98.7	4.78

Method: Polychlorobiphenyls

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
PCB 031	$\mu\text{g/kg}$	3.11	0.757	24.3	10	3.15	0.373	0.299	9.62
PCB 105	$\mu\text{g/kg}$	0.984	0.263	26.7	12	1.03	0.160	0.095	9.63
PCB 128	$\mu\text{g/kg}$	1.33	0.604	45.4	15	1.52	0.300	0.195	14.7
PCB 149	$\mu\text{g/kg}$	8.72	3.38	38.8	10	8.65	1.80	1.34	15.3
PCB 156	$\mu\text{g/kg}$	0.854	0.748	87.5	11	1.15	0.550	0.282	33.0
PCB 077	$\mu\text{g/kg}$	0.467	0.214	45.9	6	0.548	0.099	0.109	23.4
PCB 189	$\mu\text{g/kg}$	0.221	0.097	43.9	4	0.250	0.052	0.061	27.4

Method: Organochlorine pesticides

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
hexachlorobutadiene	$\mu\text{g/kg}$	0.778	0.345	44.4	9	0.709	0.279	0.144	18.5
pentachlorobenzene	$\mu\text{g/kg}$	1.29	0.454	35.3	19	1.40	0.253	0.130	10.1
1,2,3 trichlorobenzene	$\mu\text{g/kg}$	1.45	0.760	52.6	13	1.71	0.396	0.264	18.2
1,2,3,4 tetrachlorobenzene	$\mu\text{g/kg}$	1.06	0.286	26.9	13	1.10	0.136	0.099	9.33
1,2,4 trichlorobenzene	$\mu\text{g/kg}$	10.0	3.69	36.8	20	11.0	2.77	1.03	10.3
1,3,5 trichlorobenzene	$\mu\text{g/kg}$	5.11	1.41	27.7	18	5.33	1.01	0.417	8.15
isodrin	$\mu\text{g/kg}$	1.64	1.45	88.7	18	2.95	0.861	0.428	26.1
aldrin	$\mu\text{g/kg}$	3.73	3.68	98.6	23	6.13	3.06	0.959	25.7
dieldrin	$\mu\text{g/kg}$	3.76	1.10	29.3	23	3.90	0.405	0.287	7.64
heptachlor epoxide	$\mu\text{g/kg}$	0.524	0.331	63.2	7	1.40	0.670	0.156	29.9
telodrin	$\mu\text{g/kg}$	1.41	0.731	51.8	18	1.77	0.537	0.215	15.3
p,p'-DDT	$\mu\text{g/kg}$	0.680	0.722	106.3	21	1.70	0.700	0.197	29.0
p,p'-DDD	$\mu\text{g/kg}$	0.981	0.346	35.3	29	1.18	0.201	0.080	8.19
o,p'-DDD	$\mu\text{g/kg}$	0.509	0.134	26.4	11	0.553	0.057	0.051	9.96
Sum trichlorobenzenes	$\mu\text{g/kg}$	18.6	2.51	13.5	6	18.4	1.60	1.28	6.87
Sum tetrachlorobenzenes	$\mu\text{g/kg}$	3.71	0.639	17.2	5	3.75	0.330	0.357	9.63

Method: Other parameters

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Mineral oil, IR	mg/kg	378	83.5	22.1	7	410	41.0	39.5	10.4
EOX	mg/kg	1.65	0.593	35.9	18	1.66	0.448	0.175	10.6
Inorganic carbon	g/kg	18.8	4.84	25.7	12	18.6	3.20	1.75	9.28
Particles < 2 μm	%	32.4	9.84	30.4	14	32.7	5.20	3.29	10.2



Indicative Values SETOC 793

Method: Other parameters									(cont.)
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Particles < 63 µm	%	70.7	18.1	25.6	16	70.4	10.7	5.66	8.01
Particles > 63 µm	%	7.35	9.68	131.7	12	6.98	6.23	3.49	47.5
CN - Total	mg/kg	1.50	0.617	41.2	35	1.58	0.425	0.130	8.71
CN - Free	mg/kg	0.675	0.179	26.5	7	0.679	0.097	0.084	12.5

Method: Metals									
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Sb	mg/kg	1.19	0.169	14.1	6	1.20	0.104	0.086	7.21
Sn	mg/kg	8.10	1.35	16.6	7	8.02	0.532	0.637	7.87
V	mg/kg	73.0	26.2	36.0	6	70.7	16.3	13.4	18.3

Method: Dibenzo-P Dioxin									
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
2,3,7,8 Cl4DD	ng/kg	4.30	0.569	13.2	5	4.10	0.348	0.318	7.40
1,2,3,7,8,9 Cl6DD	ng/kg	2.55	0.649	25.5	4	2.62	0.300	0.406	15.9
1,2,3,4,6,7,8 Cl7DD	ng/kg	51.7	19.6	37.9	5	49.6	6.30	11.0	21.2
Cl8DD	ng/kg	578	153	26.4	5	636	85.0	85.3	14.8

Method: Dibenzofuran									
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
2,3,7,8 Cl4DF	ng/kg	8.47	0.534	6.3	5	8.51	0.314	0.299	3.53
2,3,4,7,8 Cl5DF	ng/kg	7.61	1.16	15.2	5	7.41	0.350	0.648	8.51
1,2,3,7,8 Cl5DF	ng/kg	7.66	0.781	10.2	5	7.45	0.398	0.436	5.70
1,2,3,4,7,8 Cl6DF	ng/kg	25.4	3.32	13.1	5	24.8	2.03	1.86	7.31
1,2,3,6,7,8 Cl6DF	ng/kg	9.83	1.98	20.1	5	10.00	1.01	1.11	11.2
2,3,4,6,7,8 Cl6DF	ng/kg	6.32	3.26	51.6	5	6.09	1.94	1.82	28.9
1,2,3,4,6,7,8 Cl7DF	ng/kg	76.9	3.35	4.4	5	78.0	2.25	1.88	2.44
1,2,3,4,7,8,9 Cl7DF	ng/kg	10.3	2.98	28.9	5	10.2	1.07	1.66	16.2
Cl8DF	ng/kg	393	143	36.3	5	390	82.8	79.7	20.3

Method: Brominated Flame Retardants									
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
BDE 209	ng/kg	55385	26931	48.6	4	54311	12131	16832	30.4



Indicative Values SETOC 793

Method: Experimental

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Tributyl Tin (TBT)	µg/kg	4.59	2.17	47.4	10	5.01	1.45	0.859	18.7
DEHP	µg/kg	852	134	15.7	6	844	79.7	68.3	8.02