



**WAGENINGEN EVALUATING PROGRAMS
FOR ANALYTICAL LABORATORIES**

Certificate of Analysis



International Sediment Exchange for Tests on Organic Contaminants

REFERENCE MATERIAL

SETOC sample 706



Certificate of Analysis SETOC 706

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 mean and standard deviation are calculated using all reported data when at least 8 results are left after removal of reported 'lower than' (<) and 0 (= zero) values. No outliers are removed.

This report is divided into three sections: Consensus Values, Indicative Values and Values for Information. The division is made on the reliability of the data. Consensus Values are based on at least 16 results while the coefficient of variation is smaller than 25 %. Indicative Values are based on at least 8 and less than 16 results or a coefficient of variation between 25 % and 50 %. Other values, based on more than 2 and less than 8 results or a coefficient of variation higher than 50 %, are given for information only.

In the sections with Consensus Values and Indicative Values the following parameters are given: mean, standard deviation, coefficient of variation, number of results, median and MAD (Median of Absolute Deviation) and the uncertainty in the consensus values. The confidence limits (at 95 % probability) are calculated for these determinands.

In the section with Information Values the following parameters are given: median, MAD and number of results. For determinands which have at least 5 results reported as smaller than (<) the median of these 'smaller than results' is calculated. In some cases this median of '<' values is much smaller than median and mean of the indicative values. This may be caused by a too optimistic (too low) value for the detection limit reported by a (small) majority of participating laboratories who report '<' -values.

All values, expressed on a weight basis (kg or %), are reported in oven dry (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 706 of Sediment from Netherlands is prepared for the WEPAL proficiency programs. The sample is used in 4 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
2003	2	3
1997	2	1
1995	2	4
1993	1	2



Consensus Values SETOC 706



Method: Metals

Element

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
As	mg/kg	1.61	0.286	17.8	61	1.65	0.200	0.046	1.54	-	1.68
Pb	mg/kg	4.03	0.716	17.7	71	4.10	0.500	0.106	3.86	-	4.20
Zn	mg/kg	15.2	1.47	9.7	96	15.1	1.00	0.19	14.88	-	15.47



Indicative Values SETOC 706

Method: Other parameters

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
AOX	mg/kg	12.8	3.34	26.1	13	13.6	2.30	1.16	10.8	-	14.8
Organic carbon	g/kg	1.61	0.561	34.8	21	1.80	0.400	0.153	1.36	-	1.86

Method: Metals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Cr	mg/kg	2.67	0.676	25.3	67	2.80	0.470	0.103	2.51	-	2.84
Cu	mg/kg	1.09	0.495	45.6	58	1.20	0.355	0.081	0.956	-	1.22
Ni	mg/kg	1.24	0.485	39.0	55	1.35	0.350	0.082	1.11	-	1.37



Informative Values SETOC 706



Method: Polycyclic aromatic hydrocarbons

Element	Unit	Median	MAD	N	Results smaller than (<)	
					Median of <	N
acenaphthene	µg/kg	5.00	4.600	17	20.00	140
acenaphthylene	µg/kg	5.00	4.990	15	50.00	130
anthracene	µg/kg	10.00	9.210	27	10.00	156
benz(a)anthracene	µg/kg	2.00	1.110	34	10.00	149
benzo(a)pyrene	µg/kg	2.10	1.120	31	10.00	156
benzo(b)fluoranthene	µg/kg	5.00	3.340	33	10.00	135
benzo(ghi)perylene	µg/kg	2.33	1.420	30	10.00	157
benzo(k)fluoranthene	µg/kg	2.00	1.100	28	10.00	152
chrysene	µg/kg	2.08	1.145	36	10.00	148
dibenz(ah)anthracene	µg/kg	4.00	3.840	23	10.00	145
fluoranthene	µg/kg	10.00	7.250	48	20.00	138
fluorene	µg/kg	5.00	4.160	25	10.00	137
indeno(1,2,3-cd)pyrene	µg/kg	3.00	2.000	31	10.00	154
naphthalene	µg/kg	8.50	6.400	26	20.00	148
phenanthrene	µg/kg	10.00	7.930	51	10.00	133
pyrene	µg/kg	4.00	3.000	42	10.00	130

Method: Polychlorobiphenyls

Element	Unit	Median	MAD	N	Results smaller than (<)	
					Median of <	N
PCB 028	µg/kg	0.290	0.1900	17	1.000	103
PCB 031	µg/kg	-	-	0	1.00	12
PCB 052	µg/kg	0.600	0.5100	17	1.000	109
PCB 101	µg/kg	0.360	0.2600	19	1.000	107
PCB 105	µg/kg	0.440	-	3	1.000	17
PCB 118	µg/kg	0.430	0.3850	8	1.000	93
PCB 128	µg/kg	-	-	0	1.00	20
PCB 138	µg/kg	1.00	0.800	29	1.50	96
PCB 149	µg/kg	0.940	0.7400	5	1.000	14
PCB 153	µg/kg	1.000	0.6700	29	1.150	98
PCB 156	µg/kg	0.380	0.1600	3	1.000	17
PCB 180	µg/kg	1.000	0.5700	29	2.000	97

Method: Organochlorine pesticides

Element	Unit	Median	MAD	N	Results smaller than (<)	
					Median of <	N



Informative Values SETOC 706

1,2,3 trichlorobenzene	µg/kg	-	-	0	2.00	13
1,2,3,4 tetrachlorobenzene	µg/kg	-	-	0	4.00	17
aldrin	µg/kg	-	-	0	1.00	76

Method: Organochlorine pesticides

Results smaller than (<)

(cont.)

Element	Unit	Median	MAD	N	Median of <	N
beta-endosulfan	µg/kg	-	-	0	1.10	34
beta-HCH	µg/kg	-	-	0	1.00	76
delta-HCH	µg/kg	2.10	0.950	4	1.00	48
dieldrin	µg/kg	3.80	3.600	3	1.00	75
endrin	µg/kg	-	-	0	1.00	73
gamma-HCH	µg/kg	1.50	1.385	8	1.00	75
heptachlor	µg/kg	-	-	0	1.00	71
hexachlorobenzene	µg/kg	0.650	0.4850	6	1.000	79
hexachlorobutadiene	µg/kg	-	-	0	1.00	36
o,p`-DDE	µg/kg	-	-	0	1.00	64
o,p`-DDT	µg/kg	-	-	0	1.00	68
p,p`-DDD	µg/kg	2.00	1.800	3	1.00	73
p,p`-DDE	µg/kg	2.09	1.585	8	1.00	75
p,p`-DDT	µg/kg	1.70	0.860	7	1.00	76
pentachlorobenzene	µg/kg	-	-	0	1.00	43

Method: Other parameters

Results smaller than (<)

Element	Unit	Median	MAD	N	Median of <	N
CN - Free	mg/kg	0.300	0.1800	4	1.000	16
CN - Total	mg/kg	0.120	0.0600	9	1.000	27
EOX	mg/kg	0.300	0.2500	19	0.100	58
Inorganic carbon	g/kg	0.690	0.1500	6	0.750	6
Mineral oil, GC	mg/kg	16.5	10.33	14	37.0	30
Mineral oil, IR	mg/kg	21.0	18.50	5	20.0	20
Particles < 2 µm	%	1.00	0.800	21	0.500	7
Particles < 63 µm	%	1.20	0.690	9		
Particles > 63 µm	%	98.0	1.00	3		

Method: Metals

Results smaller than (<)

Element	Unit	Median	MAD	N	Median of <	N
Cd	mg/kg	0.1000	0.0500	33	0.3000	65



Informative Values SETOC 706



Hg	mg/kg	0.0300	0.0200	35	0.1000	53
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