WAGENINGEN EVALUATING PROGRAMS

FOR ANALYTICAL LABORATORIES

Certificate of Analysis

International Sediment Exchange for Tests on Organic Contaminants

REFERENCE MATERIAL

SETOC sample 705

WAGENINGEN
UNIVERSITY & RESEARCH

Certificate of Analysis SETOC 705

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 ^{o}C and milled to pass a 0.5 mm sieve.

This SETOC sample 705 of Sediment from Netherlands is prepared for the WEPAL proficiency programs. The sample is used in 1 period (or round). The results on which the values in this report are based were taken from the period given in the following table.

Year	Round	Number
1992	4	3

Consensus Values SETOC 705

Method: Polycyclic aromatic hydrocarbons

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
benzo(b)fluoranthene	µg/kg	85.7	18.70	21.8	20	89.8	13.25	5.23	77.0 - 94.5

Indicative Values SETOC 705

Method: Polycyclic aromatic hydrocarbons

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
anthracene	µg/kg	12.8	3.34	26.1	10	13.5	2.45	1.32	10.5 - 15.2
benz(a)anthracene	µg/kg	42.8	10.47	24.5	15	43.0	7.00	3.38	37.0 - 48.6
benzo(a)pyrene	µg/kg	48.4	21.90	45.2	15	47.0	15.00	7.07	36.4 - 60.5
benzo(k)fluoranthene	µg/kg	34.6	9.13	26.4	15	35.9	6.10	2.95	29.6 - 39.6
chrysene	µg/kg	48.0	19.51	40.6	18	50.0	13.75	5.75	38.4 - 57.7
fluoranthene	µg/kg	106	29.5	27.9	20	112	21.5	8.2	91.9 - 119
indeno(1,2,3-cd)pyrene	µg/kg	66.3	22.42	33.8	18	60.0	14.50	6.61	55.2 - 77.4
naphthalene	µg/kg	52.2	24.34	46.7	9	55.4	15.40	10.14	33.8 - 70.5
phenanthrene	µg/kg	80.6	29.11	36.1	19	80.0	20.00	8.35	66.6 - 94.5
pyrene	µg/kg	65.7	14.70	22.4	14	69.0	10.50	4.91	57.3 - 74.1

Method: Polychlorobiphenyls

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
PCB 138	µg/kg	4.13	1.632	39.5	9	4.80	1.100	0.680	2.90 - 5.37

Method: Metals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
As	mg/kg	10.2	1.35	13.3	10	10.0	1.00	0.53	9.21 - 11.1
Cd	mg/kg	0.735	0.1165	15.8	12	0.700	0.0800	0.0420	0.662 - 0.808
Cr	mg/kg	28.9	4.53	15.7	11	29.0	3.00	1.71	25.8 - 31.9
Cu	mg/kg	13.5	0.83	6.2	12	13.5	0.55	0.30	13.0 - 14.0
Hg	mg/kg	0.294	0.0396	13.5	9	0.300	0.0300	0.0165	0.264 - 0.323
Ni	mg/kg	14.1	2.27	16.1	11	14.0	1.50	0.86	12.6 - 15.6
Pb	mg/kg	33.7	7.14	21.2	12	34.2	4.88	2.58	29.3 - 38.2
Zn	mg/kg	193	15.1	7.8	12	191	10.5	5.5	184 - 203

Informative Values SETOC 705

Method: Polycyclic aromatic hydrocarbons					Results smaller than (<)	
Element	**Unit**	**Median**	**MAD**	**N**	**Median of <**	**N**
acenaphthene	µg/kg	20.0	6.65	6	50.0	13
acenaphthylene	µg/kg	100.0	93.80	3	50.0	15
benzo(ghi)perylene	µg/kg	61.0	19.00	17	50.0	6
dibenz(ah)anthracene	µg/kg	16.0	6.00	5	25.0	14
fluorene	µg/kg	20.6	9.00	14	100.0	6

Method: Polychlorobiphenyls					Results smaller than (<)	
Element	**Unit**	**Median**	**MAD**	**N**	**Median of <**	**N**
PCB 028	µg/kg	2.90	0.900	7	5.00	9
PCB 052	µg/kg	2.00	1.000	5	5.00	11
PCB 101	µg/kg	2.00	1.000	7	8.50	10
PCB 118	µg/kg	3.00	1.800	5	10.00	9
PCB 153	µg/kg	4.40	1.900	8	8.00	10
PCB 180	µg/kg	2.85	1.850	8	10.00	9

Method: Organochlorine pesticides					Results smaller than (<)	
Element	**Unit**	**Median**	**MAD**	**N**	**Median of <**	**N**
beta-HCH	µg/kg	-	-	0	8.00	13
dieldrin	µg/kg	-	-	0	10.0	13
endrin	µg/kg	-	-	0	4.50	14
gamma-HCH	µg/kg	-	-	0	5.00	13
hexachlorobenzene	µg/kg	1.50	0.440	5	10.00	10
p,p`-DDD	µg/kg	2.00	0.070	3	10.00	10
p,p`-DDE	µg/kg	1.35	0.350	6	10.00	10
p,p`-DDT	µg/kg	1.80	0.800	3	10.00	12