QUASIMEME

Quality assurance of information for marine environmental monitoring

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Certificate of Analysis

Sediment

REFERENCE MATERIAL

Sediment sample 56

WAGENINGEN
UNIVERSITY & RESEARCH

Certificate of Analysis Sediment 56

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 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 10 results while the relative uncertainty is smaller than 6.25%. Indicative Values are based on a relative uncertainty of maximum 35% with at least 4 and less than 10 results or a relative uncertainty higher than 6.25%.

For each determinand the following parameters are given: mean, standard deviation, coefficient of variation, number of results, median, MAD (Median of Absolute Deviation) and the uncertainty in the assigned value. The confidence limits (at 95 % probabilty) are calculated for these determinands.

The results of each determinand is expressed on dried sediment.

Sample information

QUASIMEME reference materials cover a range of natural Marine sediment species from contaminated waters from the North Sea and/or Mediterranean. There is no spiking, mixing or other alterations of the samples. For sample preparation the sediment samples are dried at 40 oC and milled to pass a 0.5 mm sieve.

This Sediment sample 56 of Mix sediment from harbor and estuary from Rotterdam harbor / Westerscheldt is prepared for the QUASIMEME proficiency programs. The results on which the values in this report are based were taken from the periods given in the following table.

Year.Round	Program	Sample Round Id
2022.2	MS2	QOR153MS
2022.2	MS8	QPF020MS
2022.1	MS7	QBC071MS

Consensus Values MS2

Method: Chlorinated organics - MS2

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
PCB28	µg/kg	2.88	0.467	16.2	22	2.82	0.315	0.124	2.67 - 3.09
PCB52	µg/kg	2.97	0.548	18.5	22	3.05	0.376	0.146	2.72 - 3.21
PCB101	µg/kg	4.43	0.949	21.4	22	4.43	0.686	0.253	4.01 - 4.85
PCB118	µg/kg	2.80	0.641	22.9	22	2.81	0.436	0.171	2.51 - 3.08
PCB138	µg/kg	4.80	0.904	18.8	20	4.93	0.593	0.253	4.38 - 5.22
PCB153	µg/kg	6.20	1.093	17.6	22	6.25	0.768	0.291	5.72 - 6.68

Method: Carbon - MS2

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
TOC	%	1.82	0.112	6.2	13	1.82	0.072	0.039	1.75 - 1.89

Indicative Values MS2

Method: Chlorinated organics - MS2

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
PCB18	µg/kg	1.02	0.112	10.9	5	1.03	0.080	0.062	0.891 - 1.15
PCB31	µg/kg	2.32	0.591	25.5	13	2.41	0.394	0.205	1.96 - 2.67
PCB44	µg/kg	1.47	0.395	26.8	5	1.42	0.270	0.221	1.02 - 1.93
PCB47	µg/kg	0.922	0.2085	22.6	6	0.938	0.1450	0.1064	0.713 - 1.13
PCB49	µg/kg	2.18	0.619	28.4	6	2.12	0.414	0.316	1.56 - 2.80
PCB66	µg/kg	2.14	0.437	20.5	6	2.16	0.299	0.223	1.70 - 2.58
PCB105	µg/kg	0.705	0.3517	49.9	12	0.744	0.2639	0.1269	0.484 - 0.926
PCB110	µg/kg	3.79	0.672	17.7	5	3.72	0.477	0.376	3.02 - 4.56
PCB128	µg/kg	0.742	0.1495	20.1	7	0.760	0.1060	0.0706	0.608 - 0.875
PCB138+PCB163	µg/kg	7.42	1.028	13.9	6	7.41	0.745	0.524	6.39 - 8.44
PCB141	µg/kg	0.782	0.2847	36.4	6	0.778	0.2035	0.1453	0.497 - 1.07
PCB149	µg/kg	5.02	1.160	23.1	8	5.22	0.766	0.512	4.07 - 5.96
PCB151	µg/kg	1.48	0.073	5.0	5	1.47	0.056	0.041	1.39 - 1.56
PCB156	µg/kg	0.485	0.1364	28.1	12	0.527	0.0971	0.0492	0.399 - 0.570
PCB158	µg/kg	0.475	0.0349	7.3	5	0.472	0.0271	0.0195	0.435 - 0.515
PCB170	µg/kg	1.76	0.478	27.2	9	1.61	0.322	0.199	1.40 - 2.12
PCB180	µg/kg	3.11	0.906	29.1	22	2.94	0.648	0.242	2.71 - 3.51
PCB183	µg/kg	0.656	0.1801	27.5	6	0.632	0.1185	0.0919	0.476 - 0.836
PCB187	µg/kg	1.72	0.209	12.2	7	1.72	0.140	0.099	1.53 - 1.90
PCB194	µg/kg	0.545	0.1817	33.3	8	0.520	0.1160	0.0803	0.397 - 0.693
a-HCH	µg/kg	0.0556	0.0173	31.2	8	0.0616	0.0134	0.0077	0.0414 - 0.0697
b-HCH	µg/kg	0.131	0.0682	52.1	9	0.140	0.0456	0.0284	0.0795 - 0.182
g-HCH	µg/kg	0.0595	0.0300	50.4	10	0.0634	0.0217	0.0118	0.0384 - 0.0806
HCB	µg/kg	1.65	0.399	24.2	18	1.55	0.260	0.118	1.45 - 1.85
HCBD	µg/kg	0.449	0.2204	49.1	4	0.470	0.1505	0.1378	0.143 - 0.755
Dieldrin	µg/kg	0.132	0.0693	52.5	8	0.146	0.0505	0.0306	0.0756 - 0.189
pp'-DDD	µg/kg	0.628	0.2739	43.6	17	0.631	0.1996	0.0830	0.487 - 0.768
pp'-DDE	µg/kg	1.01	0.293	29.0	16	1.02	0.194	0.091	0.855 - 1.17
pp'-DDT	µg/kg	0.510	0.1269	24.9	12	0.516	0.0850	0.0458	0.430 - 0.590

Method: Nitrogen - MS2

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
PN	%	0.170	0.0132	7.8	5	0.170	0.0100	0.0074	0.154 - 0.185

Consensus Values MS7

Method: Brominated Flame Retardants - MS7

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
BDE047	µg/kg	0.474	0.0449	9.5	12	0.480	0.0304	0.0162	0.445 - 0.502
BDE099	µg/kg	0.360	0.0497	13.8	12	0.363	0.0364	0.0179	0.329 - 0.392

Indicative Values MS7

Method: Brominated Flame Retardants - MS7

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
BDE028	µg/kg	0.0816	0.0202	24.8	11	0.0900	0.0130	0.0076	0.0682 - 0.0950
BDE100	µg/kg	0.104	0.0353	33.8	11	0.0980	0.0240	0.0133	0.0811 - 0.128
BDE153	µg/kg	0.108	0.0352	32.7	9	0.120	0.0200	0.0147	0.0812 - 0.134
BDE154	µg/kg	0.0557	0.0280	50.3	8	0.0685	0.0186	0.0124	0.0328 - 0.0785
BDE183	µg/kg	0.0750	0.0106	14.1	8	0.0790	0.0075	0.0047	0.0664 - 0.0836
BDE209	µg/kg	24.2	5.09	21.0	9	24.9	3.05	2.12	20.3 - 28.0
BDE66	µg/kg	0.0194	0.0034	17.4	6	0.0199	0.0024	0.0017	0.0160 - 0.0228
BDE85	µg/kg	0.0146	0.0057	38.7	5	0.0170	0.0040	0.0032	0.0081 - 0.0212

Indicative Values MS8

Method: Perfluorinated alkyl substances - MS8

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
n-PFOS	µg/kg	0.745	0.1363	18.3	7	0.731	0.0922	0.0644	0.624 - 0.867
total-PFOS	µg/kg	0.940	0.2912	31.0	9	0.990	0.2200	0.1213	0.721 - 1.16
PFOA	µg/kg	0.110	0.0179	16.3	8	0.117	0.0131	0.0079	0.0955 - 0.125
PFNA	µg/kg	0.0324	0.0084	25.8	4	0.0351	0.0061	0.0052	0.0208 - 0.0441
PFDA	µg/kg	0.164	0.0663	40.4	8	0.147	0.0435	0.0293	0.110 - 0.218
PFUnDA	µg/kg	0.124	0.0141	11.4	8	0.128	0.0097	0.0062	0.112 - 0.135
PFDoA	µg/kg	0.113	0.0175	15.5	8	0.120	0.0132	0.0077	0.0986 - 0.127
NEtFOSAA	µg/kg	0.261	0.0796	30.5	4	0.259	0.0523	0.0498	0.150 - 0.371