QUASIMEME

Quality assurance of information
for marine environmental monitoring

Certificate of Analysis

Sediment

REFERENCE MATERIAL

Sediment sample 50

WAGENINGEN
UNIVERSITY & RESEARCH

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 50 of harbor sediment from outside harbor of Oostend, Belgium 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
2020.2	MS2	QOR145MS
2020.2	MS3	QPH108MS
2020.2	MS6	QSP075MS
2020.2	MS7	QBC065MS

Consensus Values   MS2

Method: Carbon - MS2

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits	
TOC	%	0.910	0.0869	9.6	13	0.930	0.0600	0.0301	0.858 -	0.962

Method: Chlorinated organics - MS2

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits	
PCB18	µg/kg	0.0242	0.0058	24.1	4	0.0251	0.0037	0.0036	0.0161 -	0.0323
PCB28	µg/kg	0.0606	0.0343	56.6	12	0.0760	0.0245	0.0124	0.0390 -	0.0822
PCB31	µg/kg	0.0637	0.0138	21.7	8	0.0660	0.0080	0.0061	0.0525 -	0.0750
PCB49	µg/kg	0.0923	0.0465	50.4	4	0.0925	0.0292	0.0291	0.0277 -	0.157
PCB52	µg/kg	0.183	0.0790	43.1	17	0.179	0.0500	0.0240	0.143 -	0.224
PCB66	µg/kg	0.0747	0.0043	5.8	4	0.0746	0.0027	0.0027	0.0687 -	0.0806
PCB101	µg/kg	0.266	0.0696	26.2	19	0.266	0.0493	0.0200	0.232 -	0.299
PCB105	µg/kg	0.0406	0.0124	30.5	9	0.0403	0.0081	0.0052	0.0313 -	0.0500
PCB110	µg/kg	0.202	0.0339	16.8	5	0.195	0.0190	0.0190	0.163 -	0.241
PCB118	µg/kg	0.134	0.0332	24.7	18	0.138	0.0220	0.0098	0.118 -	0.151
PCB128	µg/kg	0.0201	0.0036	17.8	5	0.0200	0.0027	0.0020	0.0160 -	0.0242
PCB138+PCB163	µg/kg	0.522	0.0580	11.1	6	0.524	0.0390	0.0296	0.464 -	0.580
PCB138	µg/kg	0.337	0.1834	54.4	18	0.360	0.1355	0.0540	0.246 -	0.428
PCB149	µg/kg	0.450	0.0922	20.5	6	0.440	0.0598	0.0471	0.358 -	0.543
PCB151	µg/kg	0.117	0.0371	31.8	4	0.116	0.0248	0.0232	0.0652 -	0.168
PCB153	µg/kg	0.393	0.1963	50.0	19	0.431	0.1420	0.0563	0.299 -	0.487
PCB156	µg/kg	0.0238	0.0096	40.2	9	0.0240	0.0070	0.0040	0.0165 -	0.0310
PCB170	µg/kg	0.128	0.0964	75.5	8	0.141	0.0700	0.0426	0.0492 -	0.206
PCB180	µg/kg	0.294	0.2077	70.6	18	0.345	0.1515	0.0612	0.191 -	0.397
PCB187	µg/kg	0.140	0.0618	44.2	6	0.153	0.0444	0.0315	0.0780 -	0.201
HCB	µg/kg	0.0284	0.0184	64.8	12	0.0313	0.0133	0.0066	0.0168 -	0.0399
pp'-DDE	µg/kg	0.0417	0.0102	24.4	11	0.0428	0.0072	0.0038	0.0350 -	0.0485

Method: Nitrogen - MS2

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits	
PN	%	0.118	0.0090	7.6	4	0.118	0.0060	0.0056	0.105 -	0.130

Consensus Values   MS3

Method: Carbon - MS3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits	
TOC	%	0.915	0.1007	11.0	14	0.935	0.0720	0.0337	0.857 -	0.973

Method: Polycyclic aromatic hydrocarbons - MS3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Acenaphthene	µg/kg	0.727	0.7045	96.9	16	0.863	0.5044	0.2201	0.354	-	1.10
Acenaphthylene	µg/kg	0.474	0.2840	60.0	12	0.475	0.2042	0.1025	0.295	-	0.652
Anthracene	µg/kg	1.43	0.484	33.9	17	1.50	0.350	0.147	1.18	-	1.67
Benzo[a]anthracene	µg/kg	2.57	1.194	46.5	20	2.79	0.866	0.334	2.01	-	3.12
Benzo[a]pyrene	µg/kg	2.22	0.854	38.5	20	2.31	0.595	0.239	1.82	-	2.62
Benzo[b]fluoranthene	µg/kg	5.39	1.772	32.9	17	5.78	1.218	0.537	4.49	-	6.30
Benzo[e]pyrene	µg/kg	4.12	1.106	26.8	11	4.16	0.810	0.417	3.39	-	4.86
Benzo[g,h,i]perylene	µg/kg	4.29	1.751	40.8	21	4.41	1.210	0.478	3.49	-	5.08
Benzo[k]fluoranthene	µg/kg	2.13	0.860	40.3	17	2.14	0.619	0.261	1.69	-	2.58
Chrysene + Triphenylene	µg/kg	3.98	1.418	35.6	7	4.57	0.923	0.670	2.71	-	5.25
Chrysene	µg/kg	2.69	0.720	26.8	16	2.72	0.495	0.225	2.31	-	3.07
Dibenz[a,h]anthracene	µg/kg	0.749	0.4650	62.1	14	0.778	0.3210	0.1554	0.483	-	1.02
Dibenzothiophene	µg/kg	0.767	0.2925	38.1	8	0.780	0.2000	0.1293	0.528	-	1.01
Fluoranthene	µg/kg	8.35	2.986	35.8	24	8.95	2.097	0.762	7.09	-	9.61
Fluorene	µg/kg	2.00	0.932	46.6	17	2.17	0.670	0.282	1.52	-	2.48
Indeno[1,2,3-cd]pyrene	µg/kg	4.51	2.017	44.7	22	4.65	1.455	0.538	3.62	-	5.40
Naphthalene	µg/kg	3.15	2.441	77.6	19	3.56	1.750	0.700	1.97	-	4.32
Perylene	µg/kg	217	69.2	31.9	12	210	48.0	25.0	173	-	260
Phenanthrene	µg/kg	7.91	3.186	40.3	23	8.60	2.284	0.830	6.53	-	9.28
Triphenylene	µg/kg	1.72	0.937	54.5	4	1.72	0.635	0.586	0.419	-	3.02
Pyrene	µg/kg	5.36	1.884	35.2	22	5.87	1.358	0.502	4.52	-	6.19
Benzofluoranthenes (b+j)	µg/kg	9.39	0.540	5.8	4	9.60	0.416	0.338	8.64	-	10.1
2-methylphenanthrene	µg/kg	2.91	0.657	22.6	5	3.26	0.540	0.367	2.15	-	3.66
1-methylnaphtalene	µg/kg	4.22	2.710	64.1	6	3.94	1.789	1.383	1.52	-	6.93
2-methylnaphtalene	µg/kg	4.19	2.822	67.4	7	3.80	1.901	1.333	1.66	-	6.71
C1-phenanthr.+anthrac.	µg/kg	8.30	4.438	53.5	5	10.40	3.100	2.481	3.20	-	13.4
C1-pyrenes+fluoranthenes	µg/kg	8.23	2.962	36.0	4	8.21	1.965	1.851	4.12	-	12.3
C1-chrysenes	µg/kg	4.51	1.701	37.7	4	4.45	1.135	1.063	2.15	-	6.87

Method: Nitrogen - MS3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
PN	%	0.121	0.0064	5.3	5	0.121	0.0050	0.0036	0.114	-	0.129

Method: Organometals - MS6

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits	
Dibutyltin (DBT)	µg Sn/kg	0.263	0.0193	7.3	4	0.260	0.0100	0.0120	0.236 -	0.290

Method: Brominated Flame Retardants - MS7

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits	
BDE209	µg/kg	0.885	0.0481	5.4	5	0.896	0.0340	0.0269	0.829 -	0.940