



QUASIMEME

Quality assurance of information
for marine environmental monitoring

Certificate of Analysis



Sediment

REFERENCE MATERIAL

Sediment sample 82



Certificate of Analysis Sediment 82

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 determinand 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.

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 °C and milled to pass a 0.5 mm sieve.

This Sediment sample 82 of Mix Oosterschelde and zeebrugge from Mix Oosterschelde and zeebrugge 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
2025.1	MS2	QOR163MS
2025.1	MS3	QPH126MS
2025.1	MS8	QPF030MS



Consensus Values MS2

Method: Chlorinated organics - MS2

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
PCB101	µg/kg	2.90	0.560	19.3	20	2.98	0.415	0.157	5.40
PCB105	µg/kg	0.438	0.062	14.1	13	0.438	0.037	0.021	4.88
PCB118	µg/kg	1.48	0.285	19.2	19	1.48	0.140	0.082	5.51
PCB44	µg/kg	1.53	0.169	11.0	8	1.58	0.065	0.075	4.87

Method: Carbon - MS2

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
TOC	%	1.78	0.091	5.1	12	1.78	0.058	0.033	1.85



Indicative Values MS2

Method: Chlorinated organics - MS2

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Dieldrin	µg/kg	0.179	0.072	40.2	4	0.201	0.038	0.045	25.1
pp'-DDE	µg/kg	0.250	0.085	34.2	11	0.242	0.032	0.032	12.9
pp'-DDT	µg/kg	0.057	0.030	53.0	6	0.077	0.015	0.015	27.1
pp'-DDD	µg/kg	0.225	0.054	24.1	11	0.216	0.029	0.020	9.09
HCB	µg/kg	0.290	0.094	32.3	10	0.277	0.060	0.037	12.8
PCB28	µg/kg	0.914	0.220	24.1	18	0.957	0.165	0.065	7.10
PCB31	µg/kg	0.802	0.226	28.2	11	0.876	0.141	0.085	10.6
PCB52	µg/kg	3.31	0.772	23.4	19	3.42	0.570	0.221	6.70
PCB138+PCB163	µg/kg	2.03	0.558	27.5	6	2.08	0.375	0.285	14.0
PCB153	µg/kg	1.77	0.413	23.4	20	1.76	0.224	0.115	6.53
PCB156	µg/kg	0.121	0.035	29.0	13	0.125	0.021	0.012	10.1
PCB180	µg/kg	0.734	0.252	34.3	17	0.741	0.187	0.076	10.4
PCB138	µg/kg	1.56	0.500	32.0	18	1.54	0.353	0.147	9.42
PCB47	µg/kg	0.418	0.124	29.8	5	0.412	0.091	0.070	16.6
PCB49	µg/kg	1.26	0.284	22.5	8	1.30	0.181	0.125	9.93
PCB66	µg/kg	1.31	0.324	24.7	6	1.28	0.169	0.166	12.6
PCB110	µg/kg	2.16	0.137	6.4	7	2.16	0.056	0.065	3.01
PCB128	µg/kg	0.273	0.101	37.1	7	0.270	0.040	0.048	17.5
PCB149	µg/kg	1.56	0.249	16.0	9	1.53	0.166	0.104	6.66
PCB170	µg/kg	0.363	0.143	39.3	10	0.389	0.077	0.056	15.5
PCB183	µg/kg	0.143	0.047	33.0	8	0.144	0.026	0.021	14.6
PCB187	µg/kg	0.435	0.085	19.5	7	0.450	0.050	0.040	9.20
PCB158	µg/kg	0.154	0.017	11.0	6	0.153	0.010	0.009	5.63
PCB141	µg/kg	0.242	0.101	41.9	5	0.230	0.062	0.057	23.4
PCB151	µg/kg	0.465	0.058	12.4	5	0.461	0.031	0.032	6.95
PCB194	µg/kg	0.112	0.058	51.5	9	0.126	0.034	0.024	21.5
PCB209	µg/kg	0.086	0.029	33.6	4	0.095	0.016	0.018	21.0

Method: Nitrogen - MS2

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
PN	%	0.219	0.016	7.5	4	0.219	0.009	0.010	4.69



Consensus Values MS3

Method: Polycyclic aromatic hydrocarbons - MS3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Indeno[1,2,3-cd]pyrene	µg/kg	49.2	10.1	20.6	25	50.4	6.36	2.54	5.16
Pyrene	µg/kg	80.5	15.7	19.5	25	79.8	9.98	3.92	4.87
Fluoranthene	µg/kg	108	22.0	20.4	25	108	12.2	5.50	5.09
Benzo[a]anthracene	µg/kg	47.5	10.4	21.9	25	47.0	7.13	2.60	5.47
Benzo[a]pyrene	µg/kg	47.9	9.59	20.0	24	49.2	6.59	2.45	5.11

Method: Carbon - MS3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
TOC	%	1.76	0.149	8.4	12	1.77	0.052	0.054	3.05



Indicative Values MS3

Method: Polycyclic aromatic hydrocarbons - MS3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Chrysene + Triphenylene	µg/kg	61.1	15.2	24.9	9	60.9	5.00	6.33	10.4
Benzo[e]pyrene	µg/kg	49.8	10.2	20.4	15	50.2	4.85	3.28	6.59
Phenanthrene	µg/kg	60.8	15.3	25.2	25	60.6	9.90	3.83	6.30
Benzo[g,h,i]perylene	µg/kg	41.7	12.5	30.0	24	44.3	7.13	3.20	7.66
Benzo[b]fluoranthene	µg/kg	67.4	25.7	38.2	21	66.6	13.1	7.02	10.4
Naphthalene	µg/kg	31.6	8.49	26.9	24	31.3	4.62	2.17	6.86
Dibenz[a,h]anthracene	µg/kg	9.60	2.73	28.4	24	9.62	1.62	0.697	7.25
Benzo[k]fluoranthene	µg/kg	30.9	8.95	29.0	22	31.9	6.46	2.38	7.73
Anthracene	µg/kg	16.1	4.41	27.4	24	16.6	2.87	1.12	7.00
Fluorene	µg/kg	11.1	4.47	40.2	25	11.2	2.74	1.12	10.0
Acenaphthene	µg/kg	7.00	2.59	37.0	21	7.04	1.66	0.706	10.1
Acenaphthylene	µg/kg	4.88	2.40	49.2	20	5.00	2.05	0.672	13.8
Dibenzothiophene	µg/kg	6.70	1.16	17.3	11	6.77	0.400	0.436	6.50
2-methylphenanthrene	µg/kg	20.5	8.17	39.8	9	23.0	6.40	3.40	16.6
Perylene	µg/kg	58.9	16.8	28.6	13	54.3	10.4	5.84	9.91
Triphenylene	µg/kg	13.0	4.50	34.7	7	13.0	2.38	2.12	16.4
Chrysene	µg/kg	48.3	14.6	30.3	21	49.8	11.2	4.00	8.27
Benzo[a]fluoranthenes (a+b+j+k)	µg/kg	117	17.3	14.8	4	117	13.6	10.8	9.24
Benzo[a]fluoranthenes (b+j)	µg/kg	103	11.0	10.7	6	102	7.86	5.62	5.47
C1-phenanthr.+anthrac.	µg/kg	64.5	18.3	28.4	11	66.0	10.7	6.90	10.7
C2-phenanthr.+anthrac.	µg/kg	64.9	25.9	39.9	11	66.3	20.9	9.76	15.1
C3-phenanthr.+anthrac.	µg/kg	41.6	14.0	33.7	9	36.1	11.0	5.84	14.0
C1-pyrenes+fluoranthenes	µg/kg	66.2	26.5	40.0	8	68.9	15.7	11.7	17.7
C2-pyrenes+fluoranthenes	µg/kg	48.5	13.5	27.8	5	50.2	7.72	7.53	15.5
C1-chrysenes	µg/kg	45.3	17.1	37.7	6	42.6	7.02	8.71	19.2
C1-naphtalenes	µg/kg	48.0	9.57	19.9	9	47.2	5.14	3.99	8.31
C2-naphtalenes	µg/kg	64.1	30.0	46.7	11	62.6	18.1	11.3	17.6
C3-naphtalenes	µg/kg	47.6	24.8	52.0	11	49.8	10.9	9.34	19.6
C1-dibenzothiophenes	µg/kg	9.22	3.71	40.3	7	9.16	1.35	1.75	19.0
C2-dibenzothiophenes	µg/kg	16.3	8.45	51.9	7	17.2	6.20	3.99	24.5
C3-dibenzothiophenes	µg/kg	11.7	5.69	48.5	7	13.9	3.84	2.69	22.9
1-methylphenanthrene	µg/kg	15.0	5.31	35.3	6	15.4	3.79	2.71	18.0
1-methylnaphtalene	µg/kg	18.0	8.27	45.9	9	18.3	4.79	3.45	19.1
2-methylnaphtalene	µg/kg	29.3	8.73	29.8	8	28.2	4.21	3.86	13.2



Indicative Values MS3

Method: Total petroleum hydrocarbons - MS3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Total petroleum hydrocarbons	mg/kg	67.1	21.3	31.7	5	67.0	8.01	11.9	17.7

Method: Nitrogen - MS3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
PN	%	0.229	0.006	2.5	5	0.231	0.003	0.003	1.41



Indicative Values MS8

Method: Perfluorinated alkyl substances - MS8

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
n-PFOS	µg/kg	0.261	0.064	24.8	11	0.251	0.036	0.024	9.33
PFOSA	µg/kg	0.025	0.009	35.1	4	0.026	0.004	0.005	21.9
PFHxA	µg/kg	0.038	0.013	33.2	5	0.034	0.007	0.007	18.6
PFHpA	µg/kg	0.025	0.007	27.5	4	0.025	0.003	0.004	17.2
PFOA	µg/kg	0.080	0.033	41.8	7	0.109	0.013	0.016	19.8
PFNA	µg/kg	0.026	0.005	20.6	5	0.026	0.003	0.003	11.5
PFDA	µg/kg	0.072	0.005	7.4	7	0.074	0.002	0.003	3.49
PFUnDA	µg/kg	0.088	0.020	22.2	7	0.093	0.012	0.009	10.5
PFDoA	µg/kg	0.039	0.012	31.3	6	0.039	0.008	0.006	16.0
total-PFOS	µg/kg	0.275	0.056	20.2	11	0.264	0.028	0.021	7.62
NMeFOSAA	µg/kg	0.098	0.016	15.9	8	0.100	0.009	0.007	7.04
NEtFOSAA	µg/kg	0.089	0.028	31.5	6	0.105	0.008	0.014	16.1