



QUASIMEME

Quality assurance of information
for marine environmental monitoring

Certificate of Analysis



Sediment

REFERENCE MATERIAL

Sediment sample 59



Certificate of Analysis Sediment 59

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 % probability) 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 59 of Harbor sediment from Rotterdam harbor 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
2020.1	MS1	QTM131MS



Consensus Values MS1

Method: Real totals - MS1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Aluminium-RT	%	5.15	0.444	8.6	13	5.07	0.320	0.154	4.88	-	5.41
Arsenic-RT	mg/kg	17.2	2.61	15.2	13	17.7	1.70	0.91	15.6	-	18.8
Cadmium-RT	µg/kg	2310	239	10.4	13	2350	165	83	2168	-	2454
Chromium-RT	mg/kg	112	16.8	15.0	15	113	12.0	5.4	103	-	121
Copper-RT	mg/kg	63.9	4.79	7.5	15	64.1	2.90	1.55	61.2	-	66.5
Iron-RT	%	3.06	0.218	7.1	14	3.09	0.130	0.073	2.94	-	3.19
Lead-RT	mg/kg	81.7	10.70	13.1	14	81.5	7.25	3.57	75.6	-	87.8
Lithium-RT	mg/kg	53.1	2.18	4.1	11	53.4	1.46	0.82	51.7	-	54.6
Manganese-RT	mg/kg	894	55.6	6.2	13	909	35.0	19.3	860	-	927
Mercury-RT	µg/kg	821	56.8	6.9	14	808	39.7	19.0	788	-	853
Nickel-RT	mg/kg	39.5	3.39	8.6	14	38.8	2.31	1.13	37.5	-	41.4
Zinc-RT	mg/kg	381	43.4	11.4	16	381	29.5	13.6	358	-	404

Method: Acid extractable (So-called totals) - MS1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Arsenic-AE	mg/kg	16.8	1.66	9.9	17	17.0	1.08	0.50	16.0	-	17.7
Cadmium-AE	µg/kg	2280	355	15.6	17	2240	260	108	2099	-	2463
Chromium-AE	mg/kg	87.4	17.25	19.7	16	84.8	11.61	5.39	78.2	-	96.5
Cobalt-AE	mg/kg	11.7	1.14	9.7	11	11.2	0.89	0.43	11.0	-	12.5
Copper-AE	mg/kg	63.0	2.60	4.1	17	62.8	1.70	0.79	61.6	-	64.3
Iron-AE	%	2.85	0.193	6.8	14	2.89	0.142	0.065	2.74	-	2.96
Lead-AE	mg/kg	80.7	8.58	10.6	17	79.7	6.23	2.60	76.3	-	85.1
Manganese-AE	mg/kg	850	61.6	7.2	14	849	44.0	20.6	815	-	886
Mercury-AE	µg/kg	814	112.9	13.9	15	766	82.0	36.4	752	-	876
Nickel-AE	mg/kg	36.2	3.33	9.2	17	35.3	2.32	1.01	34.5	-	37.9
Zinc-AE	mg/kg	388	27.5	7.1	17	384	20.0	8.3	374	-	402



Indicative Values MS1

Method: Real totals - MS1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Barium-RT	mg/kg	326	7.6	2.3	6	325	5.4	3.9	318	-	334
Cobalt-RT	mg/kg	12.8	1.86	14.5	7	12.9	1.30	0.88	11.1	-	14.5
Phosphorus-RT	mg/kg	1600	149	9.3	5	1570	104	83	1426	-	1769
Strontium-RT	mg/kg	223	7.6	3.4	6	224	6.0	3.9	215	-	230
Vanadium-RT	mg/kg	82.4	11.57	14.0	9	81.9	8.60	4.82	73.7	-	91.1

Method: Acid extractable (So-called totals) - MS1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Aluminium-AE	%	3.78	0.893	23.6	11	4.01	0.610	0.337	3.19	-	4.37
Barium-AE	mg/kg	231	59.9	25.9	6	233	43.5	30.6	171	-	291
Calcium-AE	g/kg	58.0	2.08	3.6	6	58.0	1.45	1.06	55.9	-	60.0
Lithium-AE	mg/kg	48.7	1.87	3.8	7	48.4	1.40	0.88	47.0	-	50.3
Magnesium-AE	mg/kg	10500	920	8.7	7	10400	560	430	9710	-	11350
Molybdenum-AE	mg/kg	0.925	0.1696	18.3	4	0.955	0.0950	0.1060	0.690	-	1.16
Phosphorus-AE	mg/kg	1550	111	7.2	6	1540	79	57	1439	-	1661
Potassium-AE	mg/kg	11500	540	4.7	4	11700	400	340	10740	-	12240
Strontium-AE	mg/kg	229	10.4	4.6	4	229	7.0	6.5	214	-	243
Thallium-AE	µg/kg	569	156.9	27.6	5	593	109.0	87.7	389	-	749
Uranium-AE	mg/kg	1.42	0.315	22.1	5	1.42	0.230	0.176	1.06	-	1.78
Vanadium-AE	mg/kg	59.9	17.57	29.3	12	61.6	11.58	6.34	48.9	-	71.0

Method: Carbon - MS1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Inorganic-Carbonate	%	2.00	0.285	14.2	4	1.99	0.188	0.178	1.61	-	2.40
TOC	%	3.18	0.206	6.5	9	3.18	0.140	0.086	3.02	-	3.34