



QUASIMEME

Quality assurance of information
for marine environmental monitoring

Certificate of Analysis



Metals in seawater

REFERENCE MATERIAL

AQ3 sample 194



Certificate of Analysis AQ3 194

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.

Please note: Most WEPA-QUASIMEME reference materials are found to be stable over the long term (>10 years) for most determinand/matrix combinations. There are a few exceptions known to us as being less stable over the long term. These are organotins in sediment (MS6), ASP in shellfish (BT7), some PAHs and PCBs in sediment (SETOC) and N-NH₄ (as N) in clay soils (ISE).

Sample information

QUASIMEME reference materials cover a range of natural SeaWater species from contaminated waters from the North Sea and/or Mediterranean.

This AQ3 sample 194 of Seawater spiked with metals from North Sea, the Netherlands 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	AQ3	QTM376SW



Consensus Values AQ3

Method: Metals - AQ3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Manganese	µg/l	1.95	0.218	11.2	8	1.96	0.109	0.096	4.93
Boron	µg/l	4247	276	6.5	8	4239	182	122	2.87
Magnesium	mg/l	1153	38.1	3.3	9	1160	21.0	15.9	1.37
Strontium	mg/l	6.84	0.321	4.7	10	6.81	0.172	0.127	1.85



Indicative Values AQ3

Method: Metals - AQ3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Copper	µg/l	2.31	0.463	20.1	14	2.31	0.312	0.155	6.70
Cadmium	µg/l	0.043	0.015	35.8	10	0.048	0.011	0.006	14.1
Lead	µg/l	0.186	0.072	38.9	12	0.208	0.041	0.026	14.1
Cobalt	µg/l	0.086	0.049	56.5	6	0.101	0.028	0.025	28.8
Iron	µg/l	1.16	0.624	53.7	4	1.36	0.330	0.390	33.5
Arsenic	µg/l	1.70	0.511	30.1	12	1.78	0.242	0.184	10.8
Nickel	µg/l	0.836	0.311	37.2	14	0.933	0.223	0.104	12.4
Zinc	µg/l	4.19	1.51	36.0	13	4.30	0.876	0.524	12.5
Vanadium	µg/l	1.67	0.336	20.2	8	1.71	0.264	0.149	8.92
Uranium	µg/l	2.95	0.110	3.7	7	2.96	0.044	0.052	1.76