QUASIMEME

Quality assurance of information for marine environmental monitoring

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Certificate of Analysis

Metals in seawater

REFERENCE MATERIAL

AQ3 sample 196

WAGENINGEN
UNIVERSITY & RESEARCH

Certificate of Analysis AQ3 196

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 WEPAL-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-NH_4 (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 196 of low salinity seawater spiked with metals (high) from North Sea, Neeltje Jans, 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	QTM378SW

Consensus Values AQ3

Method: Metals - AQ3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Copper	µg/l	36.8	4.07	11.1	15	37.5	2.50	1.31	3.57
Cadmium	µg/l	3.78	0.311	8.2	15	3.86	0.167	0.100	2.66
Lead	µg/l	22.5	1.99	8.8	16	22.5	1.32	0.621	2.76
Cobalt	µg/l	66.7	3.26	4.9	11	66.4	2.17	1.23	1.84
Manganese	µg/l	117	3.03	2.6	10	116	1.40	1.20	1.03
Arsenic	µg/l	106	7.10	6.7	14	106	5.00	2.37	2.23
Chromium	µg/l	68.5	2.85	4.2	13	68.2	1.80	0.987	1.44
Nickel	µg/l	166	16.4	9.8	17	164	15.7	4.96	2.98
Zinc	µg/l	186	19.6	10.6	15	188	14.2	6.34	3.41
Boron	µg/l	1938	111	5.7	8	1937	94.0	49.1	2.53
Vanadium	µg/l	115	5.72	5.0	11	115	4.00	2.16	1.88
Tin	µg/l	79.2	3.67	4.6	10	79.2	3.20	1.45	1.83
Magnesium	mg/l	537	24.4	4.5	9	538	13.4	10.2	1.89
Strontium	mg/l	3.45	0.162	4.7	9	3.42	0.105	0.067	1.95

Indicative Values AQ3

Method: Metals - AQ3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Iron	µg/l	89.5	7.99	8.9	7	88.9	6.25	3.77	4.22
Silver	µg/l	6.40	0.384	6.0	7	6.29	0.382	0.181	2.83
Thallium	µg/l	2.34	0.115	4.9	5	2.33	0.067	0.064	2.75
Uranium	µg/l	9.76	0.249	2.6	6	9.75	0.105	0.127	1.30