QUASIMEME

Quality assurance of information for marine environmental monitoring

Certificate of Analysis

Metals in seawater

REFERENCE MATERIAL

AQ3 sample 191

WAGENINGEN
UNIVERSITY & RESEARCH

Certificate of Analysis AQ3 191

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.

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 191 of Low salinity seawater spiked with metals from North Sea (diluted), 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
2024.2	AQ3	QTM369SW

Consensus Values AQ3

Method: Metals - AQ3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Copper	µg/l	21.4	1.78	8.3	19	21.5	0.951	0.511	2.39
Cadmium	µg/l	0.650	0.080	12.3	17	0.660	0.038	0.024	3.72
Lead	µg/l	7.75	0.594	7.7	19	7.70	0.400	0.170	2.20
Cobalt	µg/l	3.27	0.273	8.4	10	3.28	0.165	0.108	3.30
Iron	µg/l	8.21	1.20	14.5	10	8.27	0.660	0.472	5.75
Manganese	µg/l	8.57	1.00	11.7	11	8.69	0.511	0.377	4.40
Arsenic	µg/l	3.92	0.339	8.7	14	3.95	0.195	0.113	2.89
Chromium	µg/l	7.96	0.348	4.4	15	7.90	0.210	0.112	1.41
Nickel	µg/l	18.3	1.08	5.9	19	18.0	0.867	0.308	1.69
Zinc	µg/l	17.8	1.10	6.2	17	17.9	0.641	0.333	1.87
Boron	µg/l	1864	227	12.2	11	1899	199	85.7	4.60
Vanadium	µg/l	8.21	0.744	9.1	12	8.13	0.372	0.269	3.27
Thallium	µg/l	1.07	0.094	8.8	8	1.09	0.039	0.041	3.88
Uranium	µg/l	2.43	0.136	5.6	9	2.43	0.090	0.057	2.34
Magnesium	mg/l	497	16.0	3.2	11	497	10.7	6.05	1.22
Strontium	mg/l	3.04	0.327	10.8	13	3.11	0.210	0.113	3.73

Indicative Values AQ3

Method: Metals - AQ3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Silver	µg/l	0.283	0.088	31.0	8	0.297	0.041	0.039	13.7
Tin	µg/l	15.4	4.21	27.4	9	16.0	2.31	1.75	11.4