

Manual for Marine Monitoring in the

COMBINE

Programme of HELCOM

Part B

General guidelines on **quality assurance** for monitoring in the Baltic Sea

Annex B-6

Examples of reference materials
for internal quality control



Last updated: 29.10.2012 (Annex number changed from Annex B 7 to Annex B 6)

ANNEX B-6 EXAMPLES OF REFERENCE MATERIALS FOR INTERNAL QUALITY CONTROL

Currently available (January 2001) CRMs for marine monitoring programmes are listed in Table B-6.1. Information on matrix composition and analyte concentrations can be found on the Internet:

BCR (Belgium) www.irmm.jrc.be/mrm.html

DHI (Denmark) www.refmat.dhi.dk

NRC (Canada) www.cm.inms.nrc.ca/ems1.htm

NIST (USA) <http://ts.nist.gov/ts/htdocs/230/232/232.htm>

IAEA (Austria) www.iaea.org/programmes/nahunet/e4/nmrm/index.htm

LGC (UK) www.lgc.co.uk/

NIES (Japan) www.nies.go.jp

The ICES Marine Chemistry Working Group (MCWG) regularly publishes comprehensive lists of suitable CRMs for marine monitoring programmes including certified determinand concentrations (the MCWG 2000 report is available

at: <http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/mhc/2000/mcwg00.pdf>

Table B-7.1. Currently available CRMs for marine monitoring programmes (January 2001).

Matrix	Certified values for	Material	Name	Manufacturer
Sediment	New batch in prep.	BCR 277R	Trace elements in estuarine sediment	BCR (Belgium)
Sediment	2 Sn-species	BCR 462	Coastal sediment	BCR (Belgium)
Sediment	2 Hg-species	BCR 580	Estuarine sediment	BCR (Belgium)
Sediment	10 Metals	MURST-ISS-A1	Antarctic sediment	BCR (Belgium)
Sediment	14 Metals	HISS-1	Marine sediment	NRC (Canada)
Sediment	20 Metals	MESS-3	Marine sediment	NRC (Canada)
Sediment	19 Metals, 3 Sn-	PACS-2	Marine sediment	NRC (Canada)

Matrix	Certified values for species	Material	Name	Manufacturer
Sediment	18 Metals	SRM 1646A	Estuarine sediment	NIST (USA)
Sediment	9 Metals	SRM 1944	New York/New Jersey sediment	NIST (USA)
Sediment	39 Metals	IAEA 356	Marine sediment	IAEA (Austria)
Sediment	23 Metals	GBW 07313	Marine sediment	NRCCRM (China)
Sediment	9 Metals	GBW 07314	Offshore marine sediment	NRCCRM (China)
Sediment	56 Metals	GBW 07315	Marine sediment	NRCCRM (China)
Sediment	56 Metals	GBW 07316	Marine sediment	NRCCRM (China)
Sediment	19 Metals	LGC6137	Estuarine sediment	LGC (UK)
Sediment	20 Metals	LGC6156	Harbour sediment	LGC (UK)
Sediment	in prep. (PAHs)	SRM 1941b	Organics in marine sediment	NIST (USA)
Sediment	24 PAHs, 29 PCBs	SRM 1944	New York/New Jersey sediment	NIST (USA)
Sediment	7 PCBs	LGC6114	Harbour sediment	LGC (UK)
Sediment	PAHs, Organo-Cl	IAEA 383	Marine sediment	IAEA (Austria)
Sediment	PAHs, Organo-Cl	IAEA 408	Marine sediment	IAEA (Austria)
Sediment	10 PCBs	NRCC-HS-1	Marine sediment	NRC (Canada)
Sediment	10 PCBs	NRCC-HS-2	Marine sediment	NRC (Canada)
Sediment	20 PAHs	NRCC-HS-3B	Harbour sediment	NRC (Canada)
Sediment	20 PAHs	NRCC-HS-4B	Harbour sediment	NRC (Canada)
Sediment	16 PAHs	NRCC-HS-5	Marine sediment	NRC (Canada)
Sediment	16 PAHs	NRCC-HS-6	Marine sediment	NRC (Canada)
Sediment	13 PAHs	SES-1	Spiked estuarine sediment	NRC (Canada)
Sediment	PCBs	CS-1	Marine sediment	NRC (Canada)

Matrix	Certified values for	Material	Name	Manufacturer
Biota	9 Metals	BCR 278R	Mussel tissue	BCR (Belgium)
Biota	6 Metals	BCR 279	Sea lettuce	BCR (Belgium)
Biota	11 Metals	BCR 414	Plankton	BCR (Belgium)
Biota	10 Metals	BCR 422	Cod muscle	BCR (Belgium)
Biota	2 Hg-species	BCR 463	Tuna fish	BCR (Belgium)
Biota	2 Hg-species	BCR 464	Tuna fish	BCR (Belgium)
Biota	3 Sn-species	BCR 477	Mussel tissue	BCR (Belgium)
Biota	3 As-species	BCR 627	Tuna fish tissue	BCR (Belgium)
Biota	10 Metals	MURST-ISS-A2	Antarctic krill	BCR (Belgium)
Biota	17 Metals and species	DOLT-2	Dogfish liver	NRC (Canada)
Biota	14 Metals, Methyl-Hg	DORM-2	Dogfish muscle	NRC (Canada)
Biota	17 Metals	LUTS-1	Lobster hepatopancreas	NRC (Canada)
Biota	15 Metals, Methyl-Hg	TORT-2	Lobster hepatopancreas	NRC (Canada)
Biota	21 Metals	SRM 1566b	Oyster tissue	NIST (USA)
Biota	2 Hg-species	SRM 1974a	Organics in mussel tissue	NIST (USA)
Biota	6 Metals, Methyl-Hg	SRM 2977	Mussel tissue	NIST (USA)
Biota	25 Metals	IAEA-140/TM	Fucus (sea plant homogenate)	IAEA (Austria)
Biota	20 Metals	GBW08571	Mussel	NRCCRM (China)
Biota	19 Metals	GBW08572	Prawn	NRCCRM (China)
Biota	27 Metals	NIES-CRM-09	Sargasso seaweed	NIES (Japan)
Biota	3 Sn-species	NIES-CRM-11	Fish tissue	NIES (Japan)
Biota	6 PCBs	BCR 349	Cod liver oil	BCR (Belgium)

Matrix	Certified values for	Material	Name	Manufacturer
Biota	6 PCBs	BCR 350	Mackerel oil	BCR (Belgium)
Biota	18 PCDDs, PCDFs, PCBs	CARP-1	Fish (carp)	NRC (Canada)
Biota	24 PCBs, 14 Pesticides	SRM 1588a	Organics in cod liver oil	NIST (USA)
Biota	27 PCBs, 15 Pesticides	SRM 1945	Organics in whale blubber	NIST (USA)
Biota	PAHs, PCBs, Pesticides	SRM 1974a	Organics in mussel tissue	NIST (USA)
Biota	PAHs, PCBs, Pesticides	SRM 2974	Organics in freeze-dried mussel tissue	NIST (USA)
Biota	PAHs, PCBs, Pesticides	SRM 2977	Mussel tissue	NIST (USA)
Biota	PAHs, PCBs, Pesticides	SRM 2978	Mussel tissue	NIST (USA)
Biota	PAHs, PCBs, Pesticides	IAEA-140/OC	Fucus (sea plant homogenate)	IAEA (Austria)
Water	6 Metals	BCR 403	Trace elements in seawater	BCR (Belgium)
Water	4 Metals	BCR 505	Trace elements in estuarine water	BCR (Belgium)
Water	Hg	BCR 579	Coastal seawater	BCR (Belgium)
Water	12 Metals	CASS-4	Nearshore seawater	NRC (Canada)
Water	10 Metals	NASS-5	Open ocean seawater	NRC (Canada)
Water	11 Metals	SLEW-3	Estuarine water	NRC (Canada)
Water	6 Metals	LGC6016	Estuarine water - metals	LGC (UK)
Water	NO ₃ , NH ₄ , PO ₄	QCWW1A	Nutrients (Concentrate in Ampoule)	DHI (Denmark)
Water	NH ₄ , PO ₄	QCWW2.1	Nutrients (Concentrate in Ampoule)	DHI (Denmark)
Water	NO ₃	QCWW2.2	Nutrients (Concentrate in Ampoule)	DHI (Denmark)

Matrix	Certified values for	Material	Name	Manufacturer
Water	TN, TP	QCWW3	Nutrients (Concentrate in Ampoule)	DHI (Denmark)
Water	DOC, TOC	QCWW4	Nutrients (Concentrate in Ampoule)	DHI (Denmark)
Water	DOC, TOC	QCWW4a	Nutrients (Concentrate in Ampoule)	DHI (Denmark)
Water	BOD	QCWW5	Nutrients (Concentrate in Ampoule)	DHI (Denmark)
Water	NO ₃ , NH ₄ , PO ₄	QCRW1	Nutrients (Concentrate in Ampoule)	DHI (Denmark)
Water	TN, TP	QCRW2	Nutrients (Concentrate in Ampoule)	DHI (Denmark)