Food and environmental matrix materials 2016

Cereals and crops • Dairy • Fish and meat • Beverages • Potable and non-potable water • Soils and sediments • Waste water • Cereals and crops • Dairy • Fish and meat

LGC Quality - ISO Guide 34 • GMP/GLP • ISO 9001 • ISO/IEC 17025 • ISO/IEC 17043

Welcome to our LGC catalogue
Food and environmental matrix materials 2016

Inside you will find an extensive range of certified reference materials (CRMs) and matrix materials that are essential tools in method development, method validation and ongoing method control, to ensure the accuracy and comparability of your analysis and enable you to have confidence in your measurements.

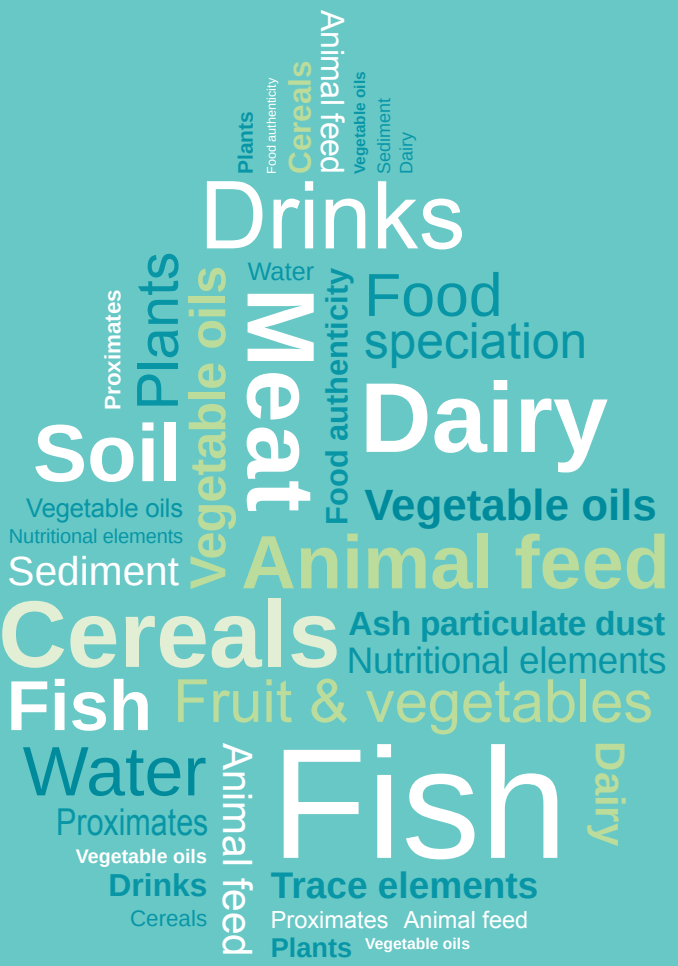
In addition to our own portfolio of high quality matrix material products, we work closely with other leading manufacturers to provide laboratories worldwide with a comprehensive range of products, covering an increasingly large range of parameters and matrices.

Our Dr. Ehrenstorfer range of organic contaminant standards, LoGiCal range of drug standards and VHG range of inorganic standards mean that we can meet all your requirements for measurement and calibration. Please log onto our webshop www.lgcstandards.com to purchase products or download a copy of these catalogues.

Our expertise as a practitioner of metrology and our experience as a producer and distributor of high quality reference materials enable us to work in partnership with you to meet your technical requirements and logistical needs.

Thank you to all of our customers who have purchased reference standards from us in the past. We value your custom and look forward to meeting your continuing needs.

If you have requirements that are not met by the products in this catalogue or any further questions, please do not hesitate to contact us at askus@lgcstandards.com.



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LGC can provide you with an exceptionally wide range of certified reference materials and matrix materials to match your quality and testing needs. We keep over 10,000 reference materials in stock to respond rapidly to your requirements.

About LGC
Science for a safer world

LGC delivers a range of measurement and testing solutions to the chemical, industrial and life sciences sectors. We provide reference materials, genomics solutions and analytical testing products and services, based on our own innovations and own intellectual property. We work with customers in the pharmaceutical, agricultural biotechnology, food, environment, security and sports sectors as well as with governments and academia to achieve excellence in investigative, diagnostic and measurement science. For more information please visit www.lgcgroup.com.

Why purchase reference materials from LGC

LGC has over 25 years experience in manufacturing and supplying reference materials for the food and beverage sectors. As both a producer of reference materials and a practitioner of accurate chemical measurement, we feel that we are in a unique position to work together with you to help you reach your measurement goals.

Our Quality

As the UK National Measurement Institute (NMI) for chemical and biological measurement, LGC participates in key comparison studies organised by the Consultative Committee for the Amount of Substance (CCQM) of the International Weights and Measures Organisation (BIPM). This provides independent verification of our measurement capabilities that are used in the production of certified reference materials.

In its role as the NMI, LGC serves on the International Organisation for Standardisation (ISO) Committee for Reference Materials (REMCO), which aims to carry out and encourage a broad international effort for the harmonization, production and application of certified reference materials (CRMs).

Processes used in our manufacturing facilities are accredited under ISO/IEC 17025 and ISO Guide 34, guaranteeing reference standards produced to a high quality.

In addition to our own products LGC works in partnership with other key specialist suppliers to provide you with a comprehensive range of certified reference materials, matrix materials and quality control materials to meet your requirements. These suppliers include other National Measurement Institutes and commercial suppliers.

European Reference Materials (ERM®)

The ERM® range of reference materials was launched in May 2004. It is the result of collaboration between three major reference material producers, LGC, the Institute for Reference Materials and Measurement (IRMM) in Belgium and Bundesanstalt fur Material forschung und Prufung (BAM) in Germany.

The partners are committed to using the most advanced principles for the production of certified reference materials. The certified values have clearly defined and stated traceability and are internationally recognized through participation of the partners in key comparisons organized by the Bureau International des Poids et Mesures (BIPM).

All ERM® materials are subject to rigorous homogeneity and stability testing guaranteeing the certified values for every unit over its complete shelf life.

Key specialist suppliers

IRMM

The Institute for Reference Materials and Measurements (IRMM) is one of the seven institutes of the Joint Research Centre (JRC), a Directorate-General of the European Commission (EC). Today IRMM is one of the world's leading reference material producers, and is accredited according to ISO Guide 34 for the production of reference materials.

IRMM reference materials including their BCR® range are the products of both research funding and direct action programmes of the European Commission, in which new or improved measurement or testing methods are developed. These programmes are aimed at improving, harmonising or standardising measurements and testing in the European Union.

As an authorised distributor of BCR® reference materials, LGC currently holds stock of more than 6000 units of certified BCR® and IRMM reference materials under carefully controlled and monitored conditions.

The National Institute of Standards and Technology (NIST)

NIST produces standard reference materials (SRMs®). Based in the United States, NIST has provided reference materials to industry and commerce for nearly 100 years. NIST collaborates with companies to provide academia and industry with SRMs for expanding areas such as air and water pollution, which are international issues.

LGC is one of a few Licensed Distributors for NIST SRMs® globally.

The National Research Council of Canada (NRC)

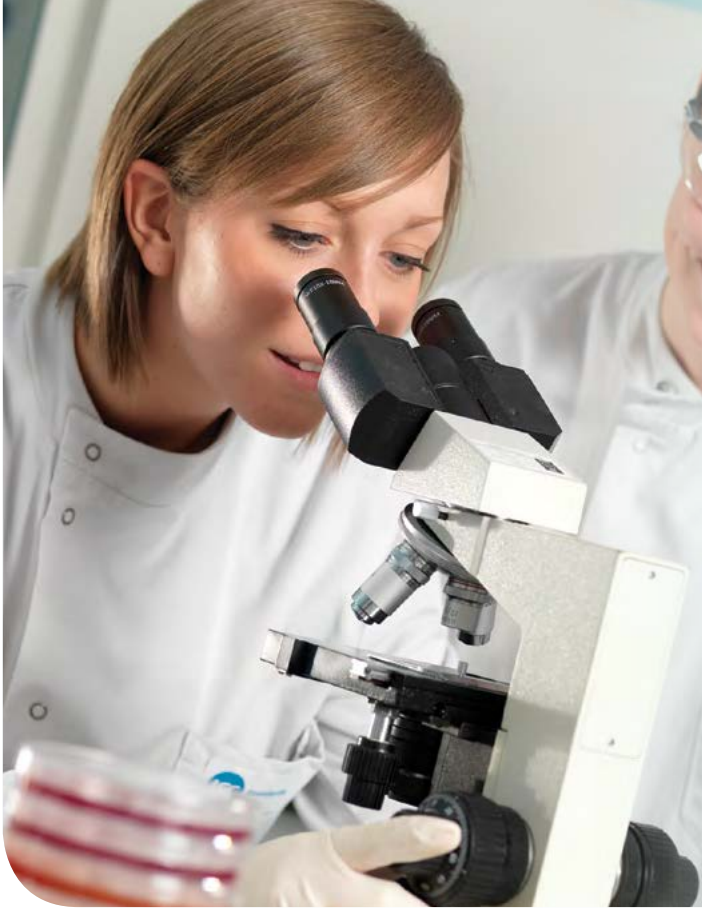
NRC produces certified reference materials (CRMs) through a program jointly operated by the Institute for National Measurement Standards (INMS), in Ottawa, Ontario and the Institute for Marine Sciences (IMB), in Halifax, Nova Scotia. The NRC range includes a variety of inorganic and organic CRMs.

The National Water Research Institute (NWRI)

NWRI is Canada's largest freshwater research establishment. It carries out a national program of research and development in the aquatic sciences in partnership with the Canadian and international freshwater science communities.

LGC produces world leading ISO Guide 34 accredited certified reference materials (CRMs), matrix reference materials and quality control materials (QCs).

Together with our network of leading international partners we offer a comprehensive range of high quality products.



Food and water microbiology reference materials

LGC Standards offers a comprehensive range of common organisms for food and water microbiological testing.

These materials contain a known level of organism with confidence limits and are quick and easy to use – each organism is supplied in a convenient easi-tab™ or vial format.

These materials complement our comprehensive range of microbiology Proficiency Testing schemes.

These reference materials are ideal for:

- Detection and enumeration
- Method validation
- Training programmes
- Internal quality control
- Culture media quality monitoring.

The following product ranges are available for microbiology tests in food and water:

- Sterile matrices for microbiology
- easi-tab™ – Food microbiology enumeration tests
- easi-tab™ – Food microbiology detection kits
- easi-tab™ – Water microbiology enumeration tests

Please visit our website **www.lgcstandards.com** or contact your local sales office for product listings • **Science** for a safer world

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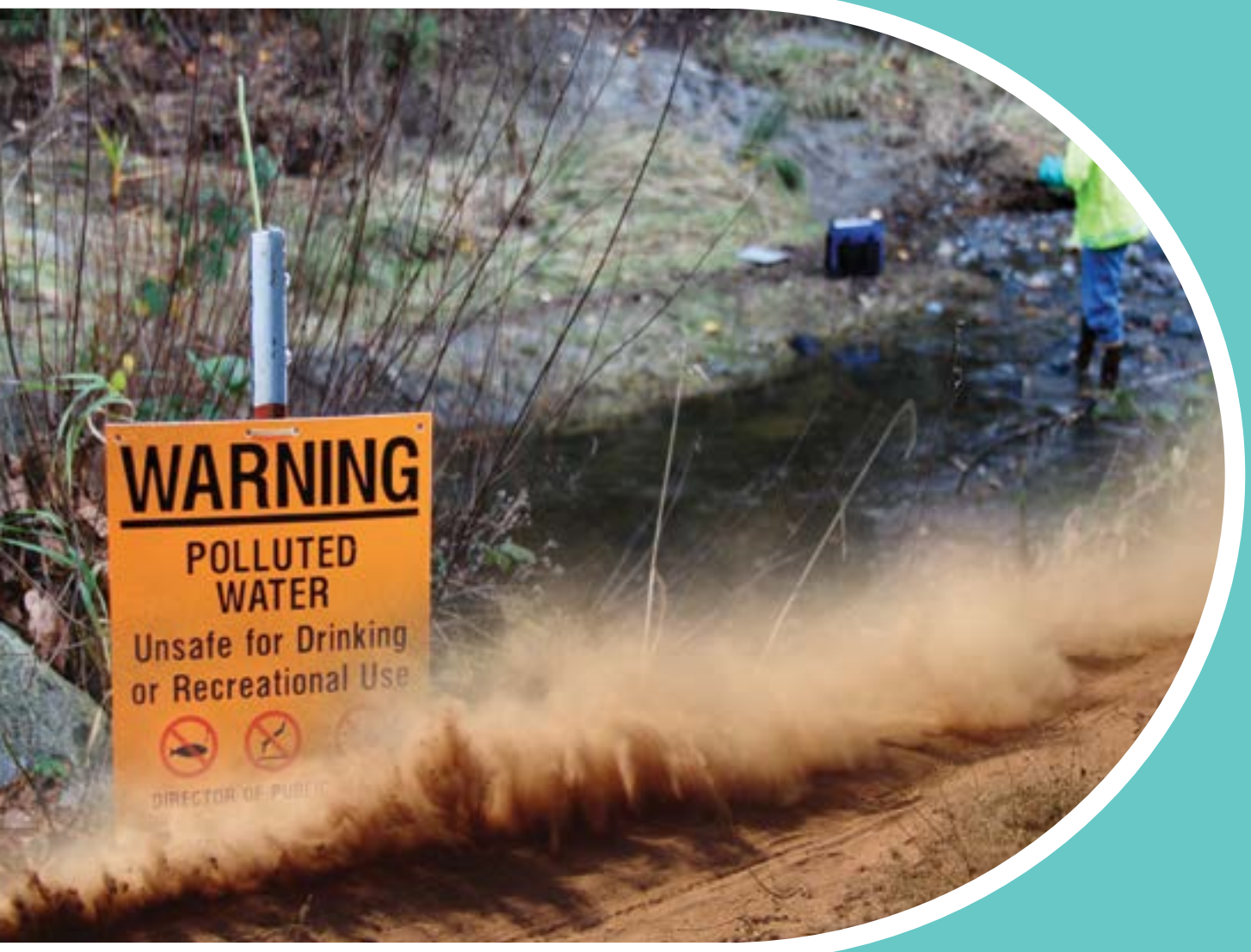
4490/CB/1015

Reference materials for environmental testing



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VHG Labs' **Certified** Reference Materials

Standards and Supplies for Aqueous and Oil Analysis

- Single-element standards
- Multi-element standards
- Custom blends
- Proficiency Testing
- Instrumentation supplies

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4490/CB/1015

Reference materials for environmental testing

Ash, particulate and dust

Code	Product	Unit
LGC6180	**Pulverised fuel ash - Extractable and total metals** Collected from a disposal site near Camarthan Bay in South Wales, UK. Pulverised fuel ash is a waste product of coal-fired power stations. The extractable metal content refers to metals soluble in Aqua Regia using methods based on ISO 11466 (1995). Extractable metal content Assessed values Al 25700 mg/kg; As 91.7 mg/kg; Ba 676 mg/kg; Ca 6415 mg/kg; Co 18.5 mg/kg; Cr 43.8 mg/kg; Cu 67.9 mg/kg; K 6170 mg/kg; Mg 3660 mg/kg; Mn 259 mg/kg; Na 1230 mg/kg; Ni 48.4 mg/kg; Pb 48.6 mg/kg; V 105 mg/kg; Zn 115 mg/kg Indicative values for B, Be, Fe, Hg, Li, Sb, Se, Ti Total metal content Indicative values for Al, As, Ba, Be, Ca, Co, Cr, Cu, Fe, K, Li, Mg, Mn, Mo, Na, Ni, Pb, Sb, Se, Sn, Ti, V, Zn	50 g
BCR-038	**Fly ash from pulverised coal - Trace elements** Certified values As 48.0 mg/kg; Cd 4.6 mg/kg; Cl 323 mg/kg; Co 53.8 mg/kg; Cr 192 mg/kg; Cu 176 mg/kg; F 538 mg/kg; Fe 33800 mg/kg; Hg 2.10 mg/kg; Mn 479 mg/kg; Na 3740 mg/kg; Pb 262 mg/kg; Zn 581 mg/kg Indicative values for Ni, Th, V	5 g
BCR-176R	**Fly ash - Trace elements** The CRM was prepared from a fly ash collected in the electrostatic filters of a city waste incineration plant.	40 g

Compound	Certified value (mg/kg)	Uncertainty (mg/kg)
As	54	5
Cd	226	19
Co	26.7	1.6
Cr	810	70
Cu	1050	70
Fe	13100	500
Ni	117	6
Pb	5000	500
Sb	850	50
Se	18.3	1.9
Tl	1.32	0.21
Zn	16800	400

Code	Product	Unit
BCR-490	**Fly ash - Dioxins and furans**	30 g

Compound	Certified value µg/kg	Uncertainty µg/kg
2,3,7,8-TCDD	0.169	0.012
1,2,3,7,8-PeCDD	0.67	0.04
1,2,3,4,7,8-HxCDD	0.95	0.11
1,2,3,6,7,8-HxCDD	4.8	0.4
1,2,3,7,8,9-HxCDD	2.84	0.17
2,3,7,8-TCDF	0.90	0.05
1,2,3,7,8-PeCDF	1.71	0.12
2,3,4,7,8-PeCDF	1.8	0.11
1,2,3,4,7,8-HxCDF	2.37	0.12
1,2,3,6,7,8-HxCDF	2.64	0.14
1,2,3,7,8,9-HxCDF	0.34	0.05
2,3,4,6,7,8-HxCDF	2.47	0.17

Code	Product	Unit
BCR-545	**Welding dust loaded on filter** Welding dust loaded on a filter. Certified values Cr (VI) 40.2 g/kg; total leachable Cr 39.5 g/kg	each
BCR-605	**Urban dust - Trimethyllead** Certified value Trimethyllead 7.9 µg/kg	15 g

Ash, particulate and dust

Code	Product	Unit
BCR-615	Fly ash - Dioxins and furans Certified values 2,3,7,8-T_4CDD (D48) ... 27 pg/g 1,2,3,7,8-P_5CDD (D54) ... 92 pg/g 1,2,3,4,7,8-H_6CDD (D66) ... 74 pg/g 1,2,3,6,7,8-H_6CDD (D67) ... 103 pg/g 1,2,3,7,8,9-H_6CDD (D70) ... 108 pg/g 1,2,3,4,6,7,8-H_7CDD (D73) ... 0.87 x 10^3 pg/g O_8CDD (D75) ... 1.75 x 10^3 pg/g 2,3,7,8-T_4CDF (F83) ... 86 pg/g 1,2,3,7,8-P_5CDF (F94) ... 176 pg/g 2,3,4,7,8-P_5CDF (F114) ... 125 pg/g 1,2,3,4,7,8-H_6CDF (F118) ... 203 pg/g 1,2,3,6,7,8-H_6CDF (F121) ... 204 pg/g 1,2,3,7,8,9-H_6CDF (F124) ... 13.3 pg/g 2,3,4,6,7,8-H_6CDF (F130) ... 130 pg/g 1,2,3,4,6,7,8-H_7CDF (F131) ... 0.75 x 10^3 pg/g 1,2,3,4,7,8,9-H_7CDF (F134) ... 61 pg/g O_8CDF (F135) ... 0.29 x 10^3 pg/g	50 g
BCR-723	Road dust - Palladium, platinum and rhodium Certified values Pd ... 6.1 µg/kg Pt ... 81.3 µg/kg Rh ... 12.8 µg/kg Indicative value for further elements	25 g
ERM-CZ100	Fine dust (PM_{10}-like) – PAHs PM_{10} (particulate matter of 10 µm and less aerodynamic diameter) Certified values Benzo[a]anthracene ... 0.91 ± 0.07 mg/kg Benzo[a]pyrene ... 0.72 ± 0.05 mg/kg Benzo[b]fluoranthene ... 1.42 ± 0.14 mg/kg Benzo[j]fluoranthene ... 0.75 ± 0.14 mg/kg Benzo[k]fluoranthene ... 0.67 ± 0.06 mg/kg Dibenzo[a,h]anthracene ... 0.18 ± 0.04 mg/kg Indeno[1,2,3,-c-d]pyrene ... 1.07 ± 0.10 mg/kg Sum of benzo[b]fluoranthene, benzo[k]fluoranthene and benzo[j]fluoranthene ... 2.84 ± 0.21 mg/kg Indicative values for further PAHs	0.5 g
ERM-CZ120	Fine dust (PM_{10}-like) - As, Cd, Pb and Ni PM_{10} (particulate matter of 10 µm and less aerodynamic diameter) Certified values Arsenic (As) ... 7.1 ± 0.7 mg/kg Cadmium (Cd) ... 0.90 ± 0.22 mg/kg Lead (Pb) ... 113 ± 17 mg/kg Nickel (Ni) ... 58 ± 7 mg/kg Indicative values for further elements.	0.5 g
ERM-EB504	Pt, Pd and Rh in used automobile catalyst - powder Certified values Pt ... 1777 ± 15 mg/kg Pd ... 279 ± 6 mg/kg Rh ... 338 ± 4 mg/kg	250 g
NIST-1648A	Urban particulate matter - Constituent elements Certified values Al ... 3.42 % As ... 115 mg/kg Br ... 502 mg/kg Ca ... 5.84 % Cd ... 75 mg/kg Ce ... 54.6 mg/kg Cl ... 4543 mg/kg Co ... 17.93 mg/kg Cr ... 402 mg/kg Cu ... 610 mg/kg Fe ... 3.92 % K ... 1.056 % Mg ... 0.813 % Mn ... 790 mg/kg Na ... 4240 mg/kg Ni ... 81.1 mg/kg Pb ... 0.655 % Rb ... 51.0 mg/kg S ... 5.51 % Sb ... 45.4 mg/kg Sr ... 215 mg/kg Ti ... 4021 mg/kg V ... 127 mg/kg Zn ... 4800 mg/kg Indicative values for Ag, B, Cs, La, Se, Si, Sm and W	2 g

Code	Product	Unit

NIST-1649B — Urban dust - Organic contaminants — 2 g

This Standard Reference Material® (SRM®) is an atmospheric particulate material collected in an urban area and is intended for use in evaluating analytical methods for the determination of selected polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyl (PCB) congeners, and chlorinated pesticides in atmospheric particulate material and similar matrices. Reference values are also provided for nitro-substituted polycyclic aromatic hydrocarbons (nitro-PAHs), decabromodiphenyl ether, toxaphene congeners, and polychlorinated dibenzo-p-dioxin and dibenzofuran congeners. Information concentration values are provided for selected hydrocarbons, hopanes, steranes, ketones, and particle-size characteristics. All of the constituents for which certified, reference, and information values are provided in NIST-1649B are naturally present in the particulate material.

Certified concentrations for selected PAHs

	Mass fraction (mg/kg)		Mass fraction (mg/kg)
Phenanthrene	3.941 ± 0.047	Benzo[e]pyrene	2.970 ± 0.043
4H-Cyclopenta[def]phenanthrene	0.252 ± 0.018	Benzo[a]pyrene	2.47 ± 0.17
Fluoranthene	6.14 ± 0.12	Perylene	0.606 ± 0.013
Pyrene	4.784 ± 0.029	Benzo[ghi]perylene	3.937 ± 0.052
Benzo[ghi]fluoranthene	0.885 ± 0.015	Indeno[1,2,3-cd]pyrene	2.96 ± 0.17
Benzo[c]phenanthrene	0.449 ± 0.014	Anthanthrene	0.509 ± 0.014
Benz[a]anthracene	2.092 ± 0.048	Dibenz[a,c]anthracene	0.212 ± 0.017
Chrysene	3.008 ± 0.044	Dibenz[a,h]anthracene	0.290 ± 0.004
Triphenylene	1.244 ± 0.052	Picene	0.390 ± 0.028
Benzo[b]fluoranthene	5.99 ± 0.20	Dibenzo[b,k]fluoranthene	0.655 ± 0.035
Benzo[j]fluoranthene	1.731 ± 0.083	Dibenzo[a,e]pyrene	0.538 ± 0.024
Benzo[k]fluoranthene	1.748 ± 0.083		

Certified concentrations for selected PCB congeners

		Mass fraction (µg/kg)
PCB 49	2,2'4,5'-Tetrachlorobiphenyl	8.92 ± 1.0
PCB 52	2,2',5,5'-Tetrachlorobiphenyl	23.7 ± 3.6
PCB 101	2,2',4,5,5'-Pentachlorobiphenyl	55.1 ± 5.1
PCB 105	2,3,3',4,4'-Pentachlorobiphenyl	9.7 ± 1.0
PCB 110	2,3,3',4',6-Pentachlorobiphenyl	32.9 ± 3.0
PCB 149	2,2',3,4',5',6-Hexachlorobiphenyl	77.5 ± 2.1
PCB 151	2,2',3,5,5',6-Hexachlorobiphenyl	32.6 ± 2.1
PCB 153	2,2',4,4',5,5'-Hexachlorobiphenyl	74.8 ± 1.0
PCB 163	2,3,3',4'5,6-Hexachlorobiphenyl	21.69 ± 0.33
PCB 183	2,2',3,4,4',5',6-Heptachlorobiphenyl	16.80 ± 0.85
PCB 187	2,2',3,4',5,5',6-Heptachlorobiphenyl	38.5 ± 2.9
PCB 194	2,2',3,3',4,4',5,5'-Octachlorobiphenyl	27.8 ± 1.6
PCB 206	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	16.6 ± 1.2

Certified concentrations for selected chlorinated pesticides

Chlorinated pesticides	Mass fraction in µg/kg	Chlorinated pesticides	Mass fraction in µg/kg
trans-Chlordane (γ-Chlordane)	50.7 ± 5.1	4,4'-DDE	49.5 ± 1.3
trans-Nonachlor	33.0 ± 3.5	4,4'-DDD	36.8 ± 1.9

Reference values for PAHs, nitro-substituted PAHs, PCBs, pesticides incl. toxaphene, decabromodiphenyl ether, dibenzo-p-dioxin and dibenzofuran congeners.

NIST-1650b — Diesel particulate matter - PAHs and nitro-PAHs — 200 mg

Certified concentrations for selected PAHs in NIST-1650b

Naphthalene	5.07 ± 0.43 mg/kg	Triphenylene	9.17 ± 0.94 mg/kg
1-Methylnaphthalene	1.51 ± 0.12 mg/kg	Benzo(a)fluoranthene	0.370 ± 0.029 mg/kg
2-Methylnaphthalene	3.05 ± 0.56 mg/kg	Benzo(b)fluoranthene	6.77 ± 0.84 mg/kg
Phenanthrene	69.5 ± 1.9 mg/kg	Benzo(j)fluoranthene	3.24 ± 0.42 mg/kg
Anthracene	7.67 ± 0.47 mg/kg	Benzo(k)fluoranthene	2.37 ± 0.21 mg/kg
1-Methylphenanthrene	28.3 ± 1.5 mg/kg	Benzo(a)pyrene	1.17 ± 0.09 mg/kg
2-Methylphenanthrene	70.7 ± 2.7 mg/kg	Benzo(e)pyrene	6.30 ± 0.50 mg/kg
3-Methylphenanthrene	55.1 ± 1.9 mg/kg	Perylene	0.165 ± 0.032 mg/kg
9-Methylphenanthrene	35.1 ± 1.9 mg/kg	Benzo(ghi)perylene	5.91 ± 0.18 mg/kg
Fluoranthene	47.3 ± 0.8 mg/kg	Indeno(1,2,3-cd)pyrene	4.44 ± 0.28 mg/kg
Pyrene	43.4 ± 1.6 mg/kg	Dibenz(a,c)anthracene	0.438 ± 0.043 mg/kg
Benzo(ghi)fluoranthene	10.8 ± 1.0 mg/kg	Dibenz(a,h)anthracene	0.365 ± 0.071 mg/kg
Benzo(c)phenanthrene	2.51 ± 0.29 mg/kg	Dibenz(a,j)anthracene	0.387 ± 0.051 mg/kg
Benz(a)anthracene	6.18 ± 0.30 mg/kg	Benzo(b)chrysene	0.290 ± 0.020 mg/kg
Chrysene	13.3 ± 1.1 mg/kg	Picene	0.499 ± 0.061 mg/kg

Certified concentrations for selected nitro-PAHs in NIST-1650b

9-Nitroanthracene	5890 ± 310 µg/kg	6-Nitrochrysene	45.5 ± 1.9 µg/kg
1-Nitropyrene	18200 ± 200 µg/kg	6-Nitrobenzo(a)pyrene	1390 ± 100 µg/kg
7-Nitrobenz(a)anthracene	967 ± 42 µg/kg	1,6-Dinitropyrene	84.0 ± 3.0 µg/kg

Reference values for selected PAHs, NItro-PAHs.
Indicative values for for particle-size characteristics and specific surface area

Ash, particulate and dust

Code	Product	Unit
NIST-1975	Diesel particulate extract - PAHs Certified Concentrations for Selected PAHs	4 x 1.2 mL

	Mass Fraction mg/kg		Mass Fraction mg/kg
Phenanthrene	8.00 ± 0.20	Triphenylene	2.38 ± 0.10
Fluoranthene	13.5 ± 0.6	Benzo(b)fluoranthene	3.20 ± 0.10
Benzo(a)anthracene	0.092 ± 0.015	Benzo(k)fluoranthene	0.174 ± 0.050
Chrysene	1.95 ± 0.07	Benzo(e)pyrene	0.268 ± 0.023

Reference Concentrations for PAHs, Nitro-substituted PAHs, Extract Residue Mass, Mutagenicity (revertants/ µg of organic extract).

Code	Product	Unit
NIST-2583	Indoor dust - Trace elements Certified values	8 g

As	7.0 mg/kg	Cr	80 mg/kg	Pb	85.9 mg/kg
Cd	7.3 mg/kg	Hg	1.56 mg/kg		

Code	Product	Unit
NIST-2584	Indoor dust - Trace elements Collected from vacuum cleaner bags used in the cleaning of interior dwelling places Certified values	8 g

As	17.4 mg/kg	Cr	135.0 mg/kg	Pb	9761 mg/kg
Cd	10.0 mg/kg	Hg	5.20 mg/kg		

Indicative values for a wide range of additional elements

Code	Product	Unit
NIST-2585	House dust - Organic contaminants	10 g

This Standard Reference Material® (SRM®) is a house dust intended for use in evaluating analytical methods for the determination of selected polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyl (PCB) congeners, chlorinated pesticides, and polybrominated diphenyl ether (PBDE) congeners in house dust and similar matrices.

Certified Concentrations for Selected PAHs

	Mass Fraction (dry-mass basis)		Mass Fraction (dry-mass basis)
Naphthalene	266 ± 8 µg/kg	Benzo[j]fluoranthene	1320 ± 110 µg/kg
Dibenzothiophene	109 ± 8 µg/kg	Benzo[k]fluoranthene	1330 ± 70 µg/kg
Phenanthrene	1920 ± 20 µg/kg	Benzo[a]fluoranthene	74.5 ± 8.1 µg/kg
Anthracene	96.0 ± 5.2 µg/kg	Benzo[e]pyrene	2160 ± 80 µg/kg
4H-cyclopenta[def]phenanthrene	117 ± 10 µg/kg	Benzo[a]pyrene	1140 ± 10 µg/kg
3-Methylphenanthrene	293 ± 36 µg/kg	Perylene	387 ± 23 µg/kg
2-Methylphenathrene	352 ± 40 µg/kg	Benzo[ghi]perylene	2280 ± 40 µg/kg
9-Methylphenanthrene	205 ± 16 µg/kg	Indeno[1,2,3-cd]pyrene	2080 ± 100 µg/kg
1-Methylphenanthrene	197 ± 29 µg/kg	Dibenz[a,j]anthracene	267 ± 9 µg/kg
Fluoranthene	4380 ± 100 µg/kg	Dibenz[a,c]anthracene	183 ± 25 µg/kg
Pyrene	3290 ± 30 µg/kg	Dibenz[a,h]anthracene	301 ± 50 µg/kg
Benzo[ghi]fluoranthene	317 ± 11 µg/kg	Benzo[b]chrysene	182 ± 6 µg/kg
Benzo[c]phenanthrene	288 ± 10 µg/kg	Picene	413 ± 15 µg/kg
Benz[a]anthracene	1160 ± 54 µg/kg	Coronene	603 ± 38 µg/kg
Chrysene	2260 ± 60 µg/kg	Dibenzo[b,k]fluoranthene	596 ± 22 µg/kg
Triphenylene	589 ± 17 µg/kg	Dibenzo[a,e]pyrene	477 ± 67 µg/kg
Benzo[b]fluoranthene	2700 ± 90 µg/kg		

Certified Concentrations for Selected PCB Congeners

		Mass Fraction (dry-mass basis)
PCB	18 (2,2',5-Trichlorobiphenyl)	12.8 ± 1.0 µg/kg
PCB	28 (2,4,4'-Trichlorobiphenyl)	13.4 ± 0.5 µg/kg
PCB	31 (2,4',5-Trichlorobiphenyl)	14.0 ± 0.5 µg/kg
PCB	44 (2,2'3,5'-Tetrachlorobiphenyl)	18.1 ± 1.9 µg/kg
PCB	52 (2,2',5,5'-Tetrachlorobiphenyl	21.8 ± 1.9 µg/kg
PCB	56 (2,3,3',4-Tetrachlorobiphenyl)	4.42 ± 0.28 µg/kg
PCB	70 (2,3',4',5-Tetrachlorobiphenyl)	13.1 ± 1.2 µg/kg
PCB	74 (2,4,4',5-Tetrachlorobiphenyl)	5.22 ± 0.51 µg/kg
PCB	87 (2,2',3,4,5'-Pentachlorobiphenyl)	16.6 ± 0.8 µg/kg
PCB	92 (2,2',3,5,5'-Pentachlorobiphenyl)	5.48 ± 0.72 µg/kg
PCB	95 (2,2',3,5',6-Pentachlorobiphenyl)	22.7 ± 2.6 µg/kg
PCB	99 (2,2',4,4',5-Pentachlorobiphenyl)	11.6 ± 0.4 µg/kg
PCB	101 (2,2',4,5,5'-Pentachlorobiphenyl)	29.8 ± 2.3 µg/kg
PCB	105 (2,3,3',4,4'-Pentachlorobiphenyl	13.2 ± 1.4 µg/kg
PCB	107 (2,3,3',4,5'-Pentachlorobiphenyl)	4.14 ± 0.47 µg/kg
PCB	110 (2,3,3',4',6-Pentachlorobiphenyl	28.1 ± 3.7 µg/kg
PCB	118 (2,3',4,4',5-Pentachlorobiphenyl)	26.3 ± 1.7 µg/kg
PCB	138 (2,2',3,4,4',5'-Hexachlorobiphenyl)	27.6 ± 2.1 µg/kg
PCB	146 (2,2',3,4',5,5'-Hexachlorobiphenyl)	4.89 ± 0.38 µg/kg
PCB	149 (2,2',3,4',5',6-Hexachlorobiphenyl)	24.4 ± 1.9 µg/kg
PCB	151 (2,2',3,5,5',6-Hexachlorobiphenyl)	6.92 ± 0.64 µg/kg
PCB	153 (2,2',4,4',5,5'-Hexachlorobiphenyl)	40.2 ± 1.8 µg/kg
	132 (2,2',3,3, ',4,6'-Hexachlorobiphenyl)	
PCB	158 (2,3,3',4,4',6-Hexachlorobiphenyl)	4.50 ± 0.43 µg/kg
PCB	163 (2,3,3',4',5,6-Hexachlorobiphenyl)	7.2 ± 1.2 µg/kg
PCB	170 (2,2',3,3',4,4',5-Heptachlorobiphenyl)	8.8 ± 1.0 µg/kg
PCB	174 (2,2',3,3',4,5,6'-Heptachlorobiphenyl)	8.83 ± 0.47 µg/kg
PCB	180 (2,2',3,4,4',5,5'-Heptachlorobiphenyl)	18.4 ± 3.2 µg/kg
PCB	183 (2,2',3,4,4',5',6-Heptachlorobiphenyl)	5.27 ± 0.39 µg/kg
PCB	187 (2,2',3,4',5,5',6-Heptachlorobiphenyl)	11.3 ± 1.4 µg/kg
PCB	206 (2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl)	3.81 ± 0.13 µg/kg

Certified Concentrations for Selected Chlorinated Pesticides

	Mass Fraction (dry-mass basis)		Mass Fraction (dry-mass basis)
4,4'-DDE	261 ± 2 µg/kg	2,4'-DDT	44.5 ± 3.9 µg/kg
4,4'-DDD	27.3 ± 0.8 µg/kg	4,4'-DDT	111 ± 23 µg/kg

Certified Concentrations for Selected PBDE Congeners

		Mass Fraction (dry-mass basis)
PBDE	17 (2,2',4-Tribromodiphenyl ether)	11.5 ± 1.2 µg/kg
PBDE	28 (2,4,4'-Tribromodiphenyl ether)	46.9 ± 4.4 µg/kg
	33 (2',3,4-Tribromodiphenyl ether)	
PBDE	47 (2,2',4,4'-Tetrabromodiphenyl ether)	497 ± 46 µg/kg
PBDE	49 (2,2',4,5'-Tetrabromodiphenyl ether)	53.5 ± 4.2 µg/kg
PBDE	85 (2,2',3,4,4'-Pentabromodiphenyl ether)	43.8 ± 1.6 µg/kg
PBDE	99 (2,2',4,4',5-Pentabromodiphenyl ether)	892 ± 53 µg/kg
PBDE	100 (2,2',4,4',6-Pentabromodiphenyl ether)	145 ± 11 µg/kg
PBDE	138 (2,2',3,4,4',5'-Hexabromodiphenylether)	15.2 ± 2.0 µg/kg
PBDE	153 (2,2',4,4',5,5'-Hexabromodiphenyl ether)	119 ± 1 µg/kg
PBDE	154 (2,2',4,4',5,6'-Hexabromodiphenyl ether)	83.5 ± 2.0 µg/kg
PBDE	155 (2,2',4,4',6,6'-Hexabromodiphenyl ether)	3.94 ± 0.34 µg/kg
PBDE	183 (2,2',3,4,4',5',6-Heptabromodiphenyl ether)	43.0 ± 3.5 µg/kg
PBDE	203 (2,2',3,4,4',5,6',6-Octabromodiphenyl ether)	36.7 ± 6.4 µg/kg
PBDE	206 (2,2',3,3',4,4',5,5',6-Nonabromodiphenyl ether)	271 ± 42 µg/kg
PBDE	209 (Decabromodiphenyl ether)	2510 ± 190 µg/kg

Ash, particulate and dust

Code	Product	Unit
NIST-2678	Blank cellulose acetate membrane filter Set of 10 blank filters Intended for use in evaluating the performance of air sampling filter methods. Certified values or limits of detection for each of 30 constituent elements as well as 6 leachable anions and cations.	set (10)
NIST-2681	Blank ashless filter - Trace elements Intended for use in evaluating the performance of air sampling filter methods. Certified values or limits of detection for each of 30 constituent elements as well as 6 leachable anions and cations.	set (10)
NIST-2783	Air particulate on filter media - Trace elements This Standard Reference Material is an air particulate sample reduced in particle size to simulate $PM_{2.5}$ air particulate matter (particles with an aerodynamic equivalent diameter of 2.5 µm) and deposited on a polycarbonate filter membrane. NIST-2783 included two loaded filters and two blank filters. Certified values Al 23210 ng; As 11.8 ng; Ba 335 ng; Ca 13200 ng; Co 7.7 ng; Cr 135 ng; Cu 404 ng; Fe 26500 ng; K 5280 ng; Mg 8620 ng; Mn 320 ng; Na 2860 ng; Ni 68 ng; Pb 317 ng; Sb 71.8 ng; Ti 1490 ng; V 48.5 ng; Zn 1790 ng Indicative values for Ce, Rb, S, Sc, Si, SM, Th, U, W	4 filter
RTC-CRM001-100G	Trace Metals in Fly Ash 1 Lot AZ01 Certified values Ba 428 ± 11.3 mg/kg; Cr (total) 29.1 ± 1.46 mg/kg; Cu 40.7 ± 1.08 mg/kg; Ni 19.8 ± 0.711 mg/kg Informational values Fe 16300 mg/kg; Mn 306 mg/kg; Sr 1020 mg/kg; Ti 465 mg/kg	100 g
RTC-CRM002-100G	Trace Metals - Activated Charcoal Lot AZ02 Certified values Ag 18.3 ± 1.50 mg/kg; Cr (total) 36300 ± 1218 mg/kg; Cu 96900 ± 2166 mg/kg	100 g
RTC-CRM012-100G	Trace Metals - Industrial incinerator ash (Fly Ash 2) Lot AR12 Certified values Ag 54.8 ± 1.47 mg/kg; Al 2160 ± 30.8 mg/kg; Ba 18.7 ± 0.372 mg/kg; Ca 2110 ± 34.2 mg/kg; Cd 362 ± 5.92 mg/kg; Cr (total) 162000 ± 2044 mg/kg; Cu 3020 ± 46.7 mg/kg; Fe 28700 ± 423 mg/kg; K 73300 ± 866 mg/kg; Mg 1510 ± 30.5 mg/kg; Mn 202 ± 2.71 mg/kg; Na 29200 ± 382 mg/kg; Ni 13300 ± 150 mg/kg; Pb 120 ± 6.26 mg/kg; Zn 635 ± 9.48 mg/kg Informational values Co 22.4 mg/kg; V 51.8 mg/kg	100 g
RTC-CRM014-50G	Trace Metals - Baghouse Dust Lot 021751 Certified values Al 6610 ± 497 mg/kg; As 4.83 ± 0.511 mg/kg; Ba 1880 ± 52.8 mg/kg; Ca 3980 ± 128 mg/kg; Cd 495 ± 14.8 mg/kg; Cr (total) 2180 ± 69.4 mg/kg; Cu 92.7 ± 5.82 mg/kg; Fe 6130 ± 738 mg/kg; K 546 ± 59.2 mg/kg; Mg 807 ± 79.5 mg/kg; Mn 98.6 ± 4.94 mg/kg; Na 842 ± 53.1mg/kg; Pb 1910 ± 69.7 mg/kg; Zn 3010 ± 154 mg/kg	50 g

Code	Product	Unit
RTC-CRM019-50G	Trace Metals - Fly Ash 3 Certified values As..... 77.2 mg/kg Ba .....352 mg/kg Cd .....432 mg/kg Cr (total)..... 55.2 mg/kg Cu .....279 mg/kg Pb ..... 4540 mg/kg Mg..... 6310 mg/kg Ni ..... 22.2 mg/kg Se ..... 4.11 mg/kg Ag ..... 7.35 mg/kg V ..... 28.9 mg/kg Zn..... 22400 mg/kg	50 g
RTC-CRM205-225G	TCLP Metals - Ash 1 Certified values As..... 35.2 mg/L Ba ..... 0.0600 mg/L Cd ..... 115 mg/L Cr (total)..... 1.17 mg/L Pb ..... 155 mg/L	225 g
NIST-RM 8785	Filter media - Air particulate matter This Reference Material NIST-RM 8785 is intended primarily for use in the evaluation of analytical methods used to characterise the carbon composition of atmospheric fine-particulate matter (PM) for national air quality monitoring programs. This RM consists of only the fine fraction (nominally < 2.5 µm aerodynamic diameter) of NIST-1649a Urban Dust resuspended in air and filtered onto quartz-fiber filter. NIST-RM 8785 also provides the atmospheric chemistry and ocean-sciences community with a means to inter-compare methods and laboratories for the measurement of elemental (black) carbon. RM 8785 has value-assignments for total carbon, elemental carbon and organic carbon measured according to two thermal-optical methods: the NIOSH and IMPROVE protocols. A unit of NIST-RM 8785 consists of three loaded filters, each uniquely identified by its APM identification number (e.g., APM 1257), its production characteristics, i.e., batch and chamber-column-row (e.g., 12959-30 and IV-D-5, respectively) and its mass of fine NIST-1649a on the filter (e.g., 1948 µg).	3 filter
NIST-RM 8786	Filter blank for NIST-RM 8785 A unit of NIST-RM 8786 consists of a single production blank filter with a 37 mm diameter	filter

Plants

Code	Product	Unit

LGC7162 — Strawberry leaves - Trace elements — 20 g

The raw material was collected from a private farm in the Czech Republic. The mixture was cut and jet milled to pass a 250 μm nylon sieve. The resulting powder was homogenised, separated in 20 g portions and placed in 60 mL bottles.

Certified Values

Ca 1.53 g/100 g	Ba 107 mg/kg	Mo 0.32 mg/kg
Mg 0.377 g/100 g	Cd 0.17 mg/kg	Hg 0.027 mg/kg
N 2.01 g/100 g	Co 0.47 mg/kg	Ni 2.6 mg/kg
P 0.260 g/100 g	Cr 2.15 mg/kg	Sr 64 mg/kg
K 1.96 g/100 g	Fe 818 mg/kg	Zn 24 mg/kg
S 0.174 g/100 g	Pb 1.8 mg/kg	
As 0.28 mg/kg	Mn 171 mg/kg	

BCR-129 — Hay powder - Trace elements — 30 g

Certified values

Ca 6.4 g/kg	Mg 1.45 g/kg	S 3.16 g/kg
I 0.167 mg/kg	N 37.2 g/kg	Zn 32.1 mg/kg
K 33.8 g/kg	P 2.36 g/kg	Kjeldahl-N 34.2 g/kg

BCR-402 — White clover - Trace elements — 25 g

Collected from an area with soil especially rich in selenium, resulting in a high selenium content

Certified values

As 0.093 mg/kg	Mo 6.93 mg/kg	
Co 0.178 mg/kg	Se 6.70 mg/kg	

Indicative values for Cr, Fe, Ni, Zn

BCR-414 — Plankton - Trace elements — 5 g

Certified values

As 6.82 µg/g	Hg 0.276 µg/g	Se 1.75 µg/g
Cd 0.383 µg/g	Mn 299 µg/g	V 8.10 µg/g
Cr 23.8 µg/g	Ni 18.8 µg/g	Zn 111.6 µg/g
Cu 29.5 µg/g	Pb 3.97 µg/g	

BCR-482 — Lichen - Trace elements — 15 g

Certified values

Al 1103 mg/kg	Cr 4.12 mg/kg	Ni 2.47 mg/kg
As 0.85 mg/kg	Cu 7.03 mg/kg	Pb 40.9 mg/kg
Cd 0.56 mg/kg	Hg 0.48 mg/kg	Zn 100.6 mg/kg

BCR-596 — Aquatic plant (trapa natans) - Chromium — 25 g

Certified value

Cr 36.3 mg/kg

BCR-670 — Aquatic plant (Lemna minor) - Trace elements — 10 g

Certified values

Ce 0.99 mg/kg	La 0.487 mg/kg	Tb 14.0 µg/kg
Dy 79 µg/kg	Lu 6.3 µg/kg	Th 0.159 mg/kg
Er 44.0 µg/kg	Nd 0.473 mg/kg	Tm 5.70 µg/kg
Eu 23.2 µg/kg	Pr 0.121 mg/kg	U 82 µg/kg
Gd 98 µg/kg	Sc 0.191 mg/kg	Y 0.46 mg/kg
Ho 15.8 µg/kg	Sm 94 µg/kg	Yb 40 µg/kg

Indicative values for : As, Cd, Cr, Cs, Cu, Fe, Mo, Ni, Pb, Sb, Se and Zn

BCR-683 — Beech wood - PCP and PAHs — 60 g

Compound	Certified value mg/kg	Uncertainty mg/kg
Pentachlorophenol	3.6	0.5
Benzo(a)anthracene	6.5	0.7
Benzo(a)pyrene	3.4	0.4
Benzo(e)pyrene	9.3	1.0
Benzo(b)fluoranthene	5.8	0.6
Benzo(k)fluoranthene	2.58	0.29

Code	Product	Unit
ERM-CD100	Wood - Trace elements and pentachlorophenol (PCP) The certified reference material ERM-CD100 is intended for the verification of a correct implementation of standardised analytical methods for waste wood characterisation such as CEN/TR 14823 for the determination of PCP or digestion methods according to EN 13657 for the determination of trace elements. Furthermore, it can be used for the validation of modified or new analytical procedures. Arsenic (As) ..... 3.1 ± 0.5 mg/kg Cadmium (Cd) ..... 3.02 ± 0.24 mg/kg Chromium (Cr) ..... 36.4 ± 2.6 mg/kg Copper (Cu) ..... 22.9 ± 1.7 mg/kg Mercury (Hg) ..... 0.60 ± 0.14 mg/kg Lead (Pb) ..... 39 ± 4 mg/kg Pentachlorophenol ..... 7.9 ± 0.6 mg/kg Additional information The moisture content of the bottled wood material at the time of certification was (7.48 ± 0.14) %, corresponding to a drying temperature of (103 ± 2) °C.	74 g
ERM-CD200	Seaweed - Trace elements The sample consists of at least 5 g of dried, powdered and homogenised bladderwrack (*Fucus vesiculosus*). The powder is contained in an amber glass bottle, sealed in an aluminized polythene sachet. Certified values Arsenic (As) ..... 55 ± 4 mg/kg Cadmium (Cd) ..... 0.95 ± 0.06 mg/kg Copper (Cu) ..... 1.71 ± 0.18 mg/kg Mercury (Hg) ..... 0.0186 ± 0.0016 mg/kg Lead (Pb) ..... 0.51 ± 0.06 mg/kg Selenium (Se) ..... 7.9 ± 0.6 mg/kg Zinc (Zn) ..... 25.3 ± 1.7 mg/kg	5 g
ERM-CD281	Rye grass - Trace elements Certified values As ..... 0.042 ± 0.01 mg/kg B ..... 5.5 ± 0.5 mg/kg Cd ..... 0.12 ± 0.007 mg/kg Cr ..... 24.8 ± 1.3 mg/kg Cu ..... 10.2 ± 0.5 mg/kg Hg ..... 0.0164 ± 0.0022 mg/kg Mn ..... 82 ± 4 mg/kg Mo ..... 2.22 ±0.12 mg/kg Ni ..... 15.2 ± 0.6 mg/kg Pb ..... 1.67 ± 0.11 mg/kg Sb ..... 0.042 ± 0.007 mg/kg Se ..... 0.023 ± 0.004 mg/kg Sn ..... 0.062 ± 0.011 mg/kg Zn ..... 30.5 ±1.1 mg/kg	vial
NIST-1515	Apple leaves - Trace elements Dried leaves from Golden Delicious and Rome varieties. Certified values Al ..... 286 mg/kg As ..... 0.038 mg/kg B ..... 27 mg/kg Ba ..... 49 mg/kg Ca ..... 1.526 % Cd ..... 0.013 mg/kg Cl ..... 579 mg/kg Cu ..... 5.64 mg/kg Fe ..... 83 mg/kg Hg ..... 0.044 mg/kg K ..... 1.61 % Mg ..... 0.271 % Mn ..... 54 mg/kg Mo ..... 0.094 mg/kg N ..... 2.25 % Na ..... 24.4 mg/kg Ni ..... 0.91 mg/kg P ..... 0.159 % Pb ..... 0.470 mg/kg Rb ..... 10.2 mg/kg Se ..... 0.050 mg/kg Sr ..... 25 mg/kg V ..... 0.26 mg/kg Zn ..... 12.5 mg/kg Indicative values for Au, Br, Ce, Co, Cr, Eu, Gd, I, La, Nd, S, Sb, Sc, Sm, Sn, Tb, Th, U, W, Yb	50 g
NIST-1547	Peach leaves - Trace elements Dried leaves from the Coronet variety. Certified values Al ..... 249 mg/kg As ..... 0.060 mg/kg B ..... 29 mg/kg Ba ..... 124 mg/kg Ca ..... 1.56 % Cd ..... 0.026 mg/kg Cl ..... 360 mg/kg Cu ..... 3.7 mg/kg Fe ..... 218 mg/kg Hg ..... 0.031 mg/kg K ..... 2.43 % Mg ..... 0.432 % Mn ..... 98 mg/kg Mo ..... 0.060 mg/kg N ..... 2.94 % Na ..... 24 mg/kg Ni ..... 0.69 mg/kg P ..... 0.137 % Pb ..... 0.87 mg/kg Rb ..... 19.7 mg/kg Se ..... 0.120 mg/kg Sr ..... 53 mg/kg V ..... 0.37 mg/kg Zn ..... 17.9 mg/kg Indicative values for Br, Ce, Co, Cr, Eu, Gd, I, La, Nd, S, Sb, Sc, Sm, Sn, Tb, Th, U, Yb	50 g
NIST-1570a	Spinach leaves - Trace elements Certified values Al ..... 310 mg/kg As ..... 0.068 mg/kg B ..... 37.6 mg/kg Cd ..... 2.89 mg/kg Ca ..... 1.527 % Co ..... 0.39 mg/kg Cu ..... 12.2 mg/kg Hg ..... 0.030 mg/kg K ..... 2.903 % Mn ..... 75.9 mg/kg Na ..... 1.818 % Ni ..... 2.14 mg/kg P ..... 0.518 % Se ..... 0.117 mg/kg Sr ..... 55.6 mg/kg Th ..... 0.48 mg/kg V ..... 0.835 mg/kg Zn ..... 30.9 mg/kg Indicative values for Ba, Br, Ce, Cl, Cs, I, La, Mg, Mo, S, Sc, Sm, Sr, U	60 g

Plants

Code	Product	Unit
NIST-1573a	Tomato leaves - Trace elements	50 g

Certified values

Al ..... 598 mg/kg	Cu ..... 4.70 mg/kg	P ..... 0.216 %
As ..... 0.112 mg/kg	Hg ..... 0.034 mg/kg	Rb ..... 14.89 mg/kg
B ..... 33.3 mg/kg	K ..... 2.70 %	Sb ..... 0.063 mg/kg
Cd ..... 1.52 mg/kg	Mn ..... 246 mg/kg	Se ..... 0.054 mg/kg
Ca ..... 5.05 %	N ..... 3.03 %	V ..... 0.57 mg/kg
Co ..... 0.57 mg/kg	Na ..... 136 mg/kg	Zn ..... 82 mg/kg
Cr ..... 1.99 mg/kg	Ni ..... 1.59 mg/kg	

Indicative values for Eu, Gd, Mg, Pb, S, Sc, Sm, Sr, Th, U

NIST-1575a	Pine needles - Trace elements and minor constituents	50 g

Certified values

P ..... 0.107 %	Ba ..... 6.0 mg/kg	Fe ..... 46 mg/kg
K ..... 0.417 %	Cd ..... 0.233 mg/kg	Hg ..... 0.0399 mg/kg
Ca ..... 0.25 %	Cl ..... 421 mg/kg	Rb ..... 16.5 mg/kg
Al ..... 580 mg/kg	Cu ..... 2 g/kg	Zn ..... 38 mg/kg

NIST-2695	Vegetation - Fluoride	2 x 25 g

Two samples of timothy grass with fluoride concentrations above natural levels.

Low level

Certified value

Fluoride ..... 64.0 μg/g

High level

Certified value

Fluoride ..... 277 μg/g

NIST-3246	Ginkgo biloba - Flavonoids, terpene , actones, elements	5 x 3 g

Standard Reference Material NIST-3246 is intended primarily for use in validating analytical methods for the determination of flavonoids, terpene lactones, and toxic elements in Ginkgo biloba and similar matrices.

Certified values

Quercetin ..... 2.69 ± 0.31 mg/g	Ginkgolide B ..... 0.470 ± 0.090 mg/g
Kaempferol ..... 3.02 ± 0.41 mg/g	Cd ..... 20.8 ± 1.0 ng/g
Isorhamnetin ..... 0.517 ± 0.099 mg/g	Pb ..... 995 ± 30 ng/g
Total Aglycones ..... 6.22 ± 0.77 mg/g	Hg ..... 23.08 ± 0.17 ng/g

Indicative values for selected terpene, lactone

NIST-3247	Ginkgo biloba extract - Flavonoids, terpene , actones, elements	5 x 1 g

Standard Reference Material NIST-3247 is intended primarily for use in validating analytical methods for the determination of flavonoids, terpene lactones, and toxic elements in Ginkgo biloba extracts and similar matrices.

Certified values

Quercetin ..... 45.1 ± 4.6 mg/g	Ginkgolide ..... 12.4 ± 1.4 mg/g
Kaempferol ..... 40.8 ± 3.0 mg/g	Ginkgolide ..... 3.9 ± 1.5 mg/g
Isorhamnetin ..... 10.8 ± 1.3 mg/g	Bilobalide ..... 28.5 ± 2.1 mg/g
Total Aglycones ..... 96.8 ± 8.3 mg/g	Total Terpene Lactones ..... 62.4 ± 5.7 mg/g
Ginkgolide ..... 11.6 ± 1.7 mg/g	Pb ..... 4.273 ± 0.031 ng/g
Ginkgolide ..... 5.92 ± 0.45 mg/g	

Indicative values for As and Cd

NIST-3248	Ginkgo-containing tablets - Flavonoids aglycones, terpene lactones	5 x 1 g

Standard Reference Material NIST-3248 is intended primarily for use in validating analytical methods for the determination of flavonoids, terpene lactones, and toxic elements in ginkgo-containing tablets and similar matrices.

Certified values

Quercetin ..... 7.56 ± 0.40	Ginkgolide B ..... 1.12 ± 0.20
Kaempferol ..... 7.19 ± 0.70	Ginkgolide C ..... 2.36 ± 0.42
Isorhamnetin ..... 1.90 ± 0.22	Total Terpene Lactones ..... 11.8 ± 1.4
Total Aglycones ..... 16.6 ± 1.2	Pb ..... 0.7753 ± 0.0089 μg/g

Indicative values for delected terpene, lactones As, Cd and Hg

NIST-3249	Ginkgo dietary supplement suite - Flavonoids, terpene , actones, elements	2 each

Standard Reference Material NIST-3249 consists of two bottles each of three ginkgo-related SRMs®: NIST-3246 Ginkgo biloba (Leaves), NIST-3247 Ginkgo biloba extract, and NIST-3248 Ginkgo–containing tablets. These SRMs are intended primarily for use in validating analytical methods for the determination of flavonoids, terpene lactones, and toxic elements in Ginkgo-containing matrices. These SRMs® can also be used for quality assurance when assigning values to in-house control materials.

NIST-4359	Seaweed	300 g

NIST-4359 contains low levels of anthropogenic and natural radioactivity.

Certified values for ^{40}K, ^{137}Cs , ^{210}Pb , ^{210}Po , ^{228}Ra , ^{232}Th , ^{234}U , ^{235}U , ^{238}U , ^{238}Pu , ^{239}Pu , $^{239,240}Pu$, ^{241}Am

Indicative values for further isotopes

Code	Product	Unit
NIST-RM 8491	Sugar cane bagasse - Whole biomass feedstocks This Reference Material (RM) is intended primarily for use in evaluating analytical methods for the determination of summative composition of lignocellulosic materials. Reference concentration values for the following constituents are given: Water extractives, 95% Ethanol extractives, Sucrose, Whole ash, Glucan, Xylan, Arabinan, Galactan, Mannan, Structural sugars, Total lignin, Acid-insoluble lignin, Acid-soluble lignin, Acetyl, Nitrogen and Total component closure.	50 g
NIST-RM 8492	Eastern cottonwood - Whole biomass feedstocks This Reference Material (RM) is intended primarily for use in evaluating analytical methods for the determination of summative composition of lignocellulosic materials. Reference concentration values for the following constituents are given: Water extractives, 95% Ethanol extractives, Sucrose, Whole ash, Glucan, Xylan, Arabinan, Galactan, Mannan, Structural sugars, Total lignin, Acid-insoluble lignin, Acid-soluble lignin, Acetyl, Nitrogen and Total component closure.	50 g
NIST-RM 8493	Monterey pine - Whole biomass feedstocks This Reference Material (RM) is intended primarily for use in evaluating analytical methods for the determination of summative composition of lignocellulosic materials. Reference concentration values for the following constituents are given: Water extractives, 95% Ethanol extractives, Sucrose, Whole ash, Glucan, Xylan, Arabinan, Galactan, Mannan, Structural sugars, Total lignin, Acid-insoluble lignin, Acid-soluble lignin, Acetyl, Nitrogen and Total component closure.	50 g
NIST-RM 8494	Wheat straw - Whole biomass feedstocks This Reference Material (RM) is intended primarily for use in evaluating analytical methods for the determination of summative composition of lignocellulosic materials. Reference concentration values for the following constituents are given: Water extractives, 95% Ethanol extractives, Sucrose, Whole ash, Glucan, Xylan, Arabinan, Galactan, Mannan, Structural sugars, Total lignin, Acid-insoluble lignin, Acid-soluble lignin, Acetyl, Nitrogen and Total component closure.	50 g
NIST-RM 8495	Northern softwood bleached kraft pulp - Properties (RM) Properties of fibres and paper sheets	10 sheets
NIST-RM 8496	Eucalyptus hardwood bleached kraft pulp - Properties (RM) Properties of fibres and paper sheets	10 sheets

Soil, sediment and sludge

Sediment

Code	Product	Unit
BCR-277R	Estuarine sediment - Trace elements Certified values	40 g

As 18.3 mg/kg	Cr 188 mg/kg	Ni 130 mg/kg
Cd 0.61 mg/kg	Cu 63 mg/kg	Zn 178 mg/kg
Co 22.5 mg/kg	Hg 0.128 mg/kg	

BCR-320R	Channel sediment - Trace elements Certified values	40 g

As 21.7 mg/kg	Hg 0.85 mg/kg	Tl 0.65 mg/kg
Cd 2.64 mg/kg	Mn 910 mg/kg	U 1.56mg/kg
Co 9.7 mg/kg	Ni 27.1 mg/kg	V 46.5mg/kg
Cr 59 mg/kg	Pb 85 mg/kg	Zn 319 mg/kg
Cu 46.3 mg/kg	Sc 5.2 mg/kg	
Fe 25700 mg/kg	Th 5.3 mg/kg	

Indicative values for Se, Sn

BCR-462	Coastal sediment - Organotin compounds	25 g

Compound	Certified value µg/kg	Uncertainty µg/kg
Tributyltin (TBT)	54	15
Dibutyltin (DBT)	68	12

Additional cost for dry ice shipment

BCR-535	Freshwater harbour sediment - PAHs	40 g

Compound	Certified value mg/kg	Uncertainty mg/kg
Pyrene	2.52	0.18
Benzo(a)anthracene	1.54	0.10
Benzo(a)pyrene	1.16	0.10
Benzo(e)pyrene	1.86	0.13
Benzo(b)fluoranthene	2.29	0.15
Benzo(k)fluoranthene	1.09	0.15
Indeno(1,2,3-cd)pyrene	1.56	0.14

BCR-536	Freshwater harbour sediment - PCBs	40 g

Compound (IUPAC Code)	Certified value µg/kg	Uncertainty µg/kg
PCB 28	44	5
PCB 52	38	4
PCB 101	44	4
PCB 105	3.5	0.6
PCB 118	27.5	2.2
PCB 128	5.4	1.2
PCB 138	27	4
PCB 149	49	4
PCB 153	50	4
PCB 156	3.0	0.4
PCB 163	17.2	2.6
PCB 170	13.4	1.4
PCB 180	22.4	2.1

BCR-667	Estuarine sediment - Trace elements Certified values	40 g

Ce 56.7 mg/kg	La 27.8 mg/kg	Tb 0.682 mg/kg
Dy 4.01 mg/kg	Lu 0.325 mg/kg	Th 10.0 mg/kg
Er 2.35 mg/kg	Nd 25.0 mg/ kg	Tm 0.326 mg/ Kg
Eu 1.00 mg/kg	Pr 6.14 mg/kg	U 2.26 mg/kg
Gd 4.41 mg/kg	Sc 13.7 mg/kg	Yb 2.20 mg/kg
Ho 0.796 mg/kg	Sm 4.66 mg/kg	

Indicative values for: As, Au, Br, Cd, Co, Cr, Cs, Cu, Fe, Mn, Ni, Pb, Sb, Se, Sr, Ta, Y and Zn

ERM-CC580	Estuarine sediment - Mercury and methylmercury	40 g

	Certified values[1]	uncertainty[2]
Total Hg	132 mg/kg	3 mg/kg
CH_3Hg^+	0.0755 mg/kg	4 µg/kg

1) Unweighted mean value of the means of 11 to 13 accepted sets of data, each set being obtained in a different laboratory and / or with a different method of determination. Certified value is based on dry mass. The certified values are traceable to SI.

2) The certified uncertainty is the half-width of the 95 % confidence interval of the mean defined in 1). k-factors were chosen according to the t-distribution depending of the number of accepted sets of results and were 2.179 for total Hg and 2.228 for MeHg.

Code	Product	Unit

NIST-1646a — Estuarine sediment - Metals — 70 g

Collected from Chesapeake Bay, USA.

Certified values

Al 2.297 %	K 0.864 %	Se 0.193 mg/kg
As 6.23 mg/kg	Mg 0.388 %	Si 40 %
Ca 0.519 %	Mn 234.5 mg/kg	Ti 0.456 %
Cd 0.148 mg/kg	Na 0.741 %	V 44.84 mg/kg
Cr 40.9 mg/kg	P 234.5 mg/kg	Zn 48.9 mg/kg
Cu 10.01 mg/kg	Pb 11.7 mg/kg	
Fe 2.008 %	S 0.352 %	

NIST-1941b — Organics in marine sediment — 50 g

Collected at the mouth of the Baltimore Harbour.
All of the constituents for which certified, reference, and information values are provided in NIST-1941b were naturally present in the sediment material before processing. A unit of NIST-1941b consists of a bottle containing 50 g of radiation-sterilized, freeze-dried sediment material.

Certified Concentrations for Selected PAHs

PAHs	Mass Fractions in µg/kg (dry-mass basis)	PAHs	Mass Fractions in µg/kg (dry-mass basis)
Naphthalene	848 ± 95	Benzo[b]fluoranthene	453 ± 21
Fluorene	85 ± 15	Benzo[k]fluoranthene	225 ± 18
Phenanthrene	406 ± 44	Benzo[e]pyrene	325 ± 25
Anthracene	184 ± 18	Benzo[a]pyrene	358 ± 17
3-Methylphenanthrene	105 ± 13	Perylene	397 ± 45
2-Methylphenathrene	128 ± 14	Benzo[ghi]perylene	307 ± 45
1-Methylphenanthrene	73.2 ± 5.9	Indeno[1,2,3-cd]pyrene	341 ± 57
Fluoranthene	651 ± 50	Dibenz[a,j]anthracene	48.9 ± 4.6
Pyrene	581 ± 39	Dibenz[a,c]anthracene	36.7 ± 5.2
Benz[a]anthracene	335 ± 25	Dibenz[a,h]anthracene	53 ± 10
Chrysene	291 ± 31	Benzo[b]chrysene	53 ± 12
Triphenylene	108 ± 5	Picene	46.6 ± 4.7

Certified Concentrations for Selected PCB Congeners

PCB Congeners		Mass Fractions in µg/kg (dry-mass basis)
PCB 8	2,4'-Dichlorobiphenyl	1.65 ± 0.19
PCB 18	2,2',5-Trichlorobiphenyl	2.39 ± 0.29
PCB 28	2,4,4'-Trichlorobiphenyl	4.52 ± 0.57
PCB 31	2,4',5-Trichlorobiphenyl	3.18 ± 0.41
PCB 44	2,2'3,5'-Tetrachlorobiphenyl	3.85 ± 0.20
PCB 49	2,2'4,5'-Tetrachlorobiphenyl	4.34 ± 0.28
PCB 52	2,2',5,5'-Tetrachlorobiphenyl	5.24 ± 0.28
PCB 66	2,3',4,4'-Tetrachlorobiphenyl	4.96 ± 0.53
PCB 87	2,2',3,4,5'-Pentachlorobiphenyl	1.14 ± 0.16
PCB 95	2,2',3,5',6-Pentachlorobiphenyl	3.93 ± 0.62
PCB 99	2,2',4,4',5-Pentachlorobiphenyl	2.90 ± 0.36
PCB 101	2,2',4,5,5'-Pentachlorobiphenyl	5.11 ± 0.34
PCB 105	2,3,3',4,4'-Pentachlorobiphenyl	1.43 ± 0.10
PCB 110	2,3,3',4',6-Pentachlorobiphenyl	4.62 ± 0.36
PCB 118	2,3',4,4',5-Pentachlorobiphenyl	4.23 ± 0.19
PCB 128	2,2',3,3',4,4'-Hexachlorobiphenyl	0.696 ± 0.044
PCB 138	2,2',3,4,4',5'-Hexachlorobiphenyl	3.60 ± 0.28
PCB 149	2,2',3,4',5',6-Hexachlorobiphenyl	4.35 ± 0.26
PCB 153	2,2',4,4',5,5'-Hexachlorobiphenyl	5.47 ± 0.32
PCB 156	2,3,3',4,4',5-Hexachlorobiphenyl	0.507 ± 0.090
PCB 170	2,2',3,3',4,4',5-Heptachlorobiphenyl	1.35 ± 0.09
PCB 180	2,2',3,4,4',5,5'-Heptachlorobiphenyl	3.24 ± 0.51
PCB 183	2,2',3,4,4',5',6-Heptachlorobiphenyl	0.979 ± 0.087
PCB 187	2,2',3,4',5,5',6-Heptachlorobiphenyl	2.17 ± 0.22
PCB 194	2,2',3,3',4,4',5,5'-Octachlorobiphenyl	1.04 ± 0.06
PCB 195	2,2',3,3',4,4',5,6-Octachlorbiphenyl	0.645 ± 0.060
PCB 201	2,2',3,3',4,5',6,6'-Octachlorobiphenyl	0.777 ± 0.034
PCB 206	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	2.42 ± 0.19
PCB 209	Decachlorobiphenyl	4.86 ± 0.45

Certified Concentrations for Selected Pesticides

Chlorinated Pesticides	Mass Fractions in µg/kg (dry-mass basis)	Chlorinated Pesticides	Mass Fractions in µg/kg (dry-mass basis)
Hexachlorobenzene	5.83 ± 0.38	trans-Nonachlor	0.438 ± 0.073
cis-Chlordane	0.85 ± 0.11	4,4'-DDE	3.22 ± 0.28
trans-Chlordane	0.566 ± 0.093	4,4'-DDD	4.66 ± 0.46
cis-Nonachlor	0.378 ± 0.053		

Reference values for selected PCBs, PCBs, Pesticides and TOC
Indicative values for carbon, hydrogen and nitrogen

Code	Product	Unit
NIST-1944	New York/New Jersey waterway sediment - PCBs and PAHs	50 g

This Standard Reference Material® (SRM®) is a mixture of marine sediment collected near urban areas in New York and New Jersey. Reference values are also provided for selected dibenzodioxin and dibenzofuran congeners, total organic carbon, total extractable material, and particle-size characteristics. All of the constituents for which certified, reference, and information values are provided were naturally present in the sediment material before processing.

Certified Concentrations for Selected PAHs

PAHs	Mass Fractions in mg/kg (dry-mass basis)	PAHs	Mass Fractions in mg/kg (dry-mass basis)
Naphthalene	1.65 ± 0.31	Benzo(a)fluoranthene	0.78 ± 012
Phenanthrene	5.27 ± .0.22	Benzo(e)pyrene	3.28 ± 0.11
Anthracene	1.77 ± 0.33	Benzo(a)pyrene	4.30 ± 0.13
Fluoranthene	8.92 ± 0.32	Perylene	1.17 ± 0.24
Pyrene	9.70 ± 0.42	Benzo(ghi)perylene	2.84 ± 0.10
Benzo(c)phenanthrene	0.76 ± 0.10	Indeno(1,2,3-cd)pyrene	2.78 ± 0.10
Benzo(a)anthracene	4.72 ± .0.11	Dibenzo(a,j)anthracene	0.500 ± 0.044
Chrysene	4.86 ± 0.10	Dibenzo(a,c)anthracene	0.335 ± 0.013
Triphenylene	1.04 ± 0.27	Dibenzo(a,h)anthracene	0.424 ± 0.069
Benzo(b)fluoranthene	3.87 ± 0.42	Pentaphene	0.288 ± 0.026
Benzo(j)fluoranthene	2.09 ± 0.44	Benzo(b)chrysene	0.63 ± 0.10
Benzo(k)fluoranthene	2.30 ± 0.20	Picene	0.518 ± 0.093

Certified Concentrations for Selected PCB Congeners

PCB Congeners	Mass Fraction in µg/kg (dry-mass basis)
PCB 8 2,4'-Dichlorobiphenyl	22.3 ± 2.3
PCB 18 2,2',5-Trichlorobiphenyl	51.0 ± 2.6
PCB 28 2,4,4'-Trichlorobiphenyl	80.8 ± 2.7
PCB 31 2,4',5-Trichlorobiphenyl	78.7 ± 1.6
PCB 44 2,2',3,5'-Tetrachlorobiphenyl	60.2 ± 2.0
PCB 49 2,2',4,5'-Tetrachlorobiphenyl	53.0 ± 1.7
PCB 52 2,2',5,5'-Tetrachlorobiphenyl	79.4 ± 2.0
PCB 66 2,3',4,4'-Tetrachlorobiphenyl	71.9 ± 4.3
PCB 87 2,2',3,4,5`-Pentachlorobiphenyl	29.9 ± 4.3
PCB 95 2,2',3,5',6-Pentachlorobiphenyl	65.0 ± 8.9
PCB 99 2,2',4,4',5-Pentachlorobiphenyl	37.5 ± 2.4
PCB 101 2,2',4,5,5'-Pentachlorobiphenyl + 90 2,2',3,4',5-Pentachlorobiphenyl	73.4 ± 2.5
PCB 105 2,3,3',4,4'-Pentachlorobiphenyl	24.5 ± 1.1
PCB 110 2,3,3',4',6-Pentachlororbiphenyl	63.5 ± 4.7
PCB 118 2,3',4,4',5-Pentachlorobiphenyl	58 ± 4.3
PCB 128 2,2',3,3',4,4'-Hexachlorobiphenyl	8.47 ± 0.28
PCB 138 2,2',3,4,4',5'-Hexachlorobiphenyl + 163 2,3,3',4',5,6-Hexachlorobiphenyl + 164 2,3,3',4',5',6-Hexachlorobiphenyl	62.1 ± 3.0
PCB 149 2,2',3,4',5',6-Hexachlorobiphenyl	49.7 ± 1.2
PCB 151 2,2',3,5,5',6-Hexachlorobiphenyl	16.93 ± 0.36
PCB 153 2,2',4,4',5,5'-Hexachlorobiphenyl	74.0 ± 2.9
PCB 156 2,3,3',4,4',5-Hexachlorobiphenyl	6.52 ± 0.66
PCB 170 2,2',3,3',4,4',5-Heptachlorobiphenyl + 190 (2,3,3',4,4',5,5'-Heptachlorobiphenyl)	22.6 ± 1.4
PCB 180 2,2',3,4,4',5,5'-Heptachlorobiphenyl	44.3 ± 1.2
PCB 183 2,2',3,4,4',5',6-Heptachlorobiphenyl	12.19 ± 0.57
PCB 187 2,2',3,4',5,5',6-Heptachlorobiphenyl + 159 2,3,3',4,5,5'-Hexachlorobiphenyl + 182 2,2',3',4,4',5,6'-Heptachlorobiphenyl	25.1 ± 1.0
PCB 194 2,2',3,3',4,4',5,5'-Octachlorobiphenyl	11.2 ± 1.4
PCB 195 2,2',3,3',4,4',5,6-Octachlorobiphenyl	3.75 ± 0.39
PCB 206 2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	9.21 ± 0.51
PCB 209 Decachlorobiphenyl	6.81 ± 0.33

Certified Concentrations for Selected Chlorinated Pesticides

Chlorinated Pesticides	Mass Fractions in µg/kg (dry-mass basis)
Hexachlorobenzene	6.03 ± 0.35
cis-Chlordane (alpha-Chlordane)	16.51 ± 0.83
trans-Nonachlor	8.20 ± 0.51
4,4'-DDT	119 ± 11

Reference Values for PAHs, Chlorinated Pesticides, Dibenz-p-dioxin and Dibenzofuran Congeners, Particle-Size Characteristics, Total Organic Carbon and Percent Extractable Mass.

Certified and reference concentrations for selected inorganic constituents.

Code	Product	Unit

NIST-2702

Marine sediment - Trace elements — 50 g

Marine sediment collected at the mouth of the Baltimore Harbour.

Certified values

Al 8.41 %	K 2.054 %	Sc 25.9 mg/kg
As 45.3 mg/kg	La 73.5 mg/kg	Sr 119.7 mg/kg
Ba 397.4 mg/kg	Mn 1757 mg/kg	Th 20.51 mg/kg
Ce 123.4 mg/kg	Na 0.681 %	Ti 0.884 %
Cd 0.817 mg/kg	Ni 75.4 mg/kg	Tl 0.8267mg/kg
Co 27.76 mg/kg	P 0.1552 %	V 357.6 mg/kg
Cr 352 mg/kg	Pb 132.8 mg/kg	Zn 485.3 mg/kg
Fe 7.91 %	Rb 127.7 mg/kg	
Hg 0.4474 mg/kg	Sb 5.60 mg/kg	

Indicative values for Ag, Ca, Ga, Mg, Mo, Se, Sn

NIST-2703

Marine sediment - Trace elements — 5 g

Sediment for solid sampling (small sample) analytical techniques
NIST-2703 is a marine sediment collected at the mouth of the Baltimore Harbor. It is primarily intended for use in evaluating analytical methods for the direct determination of selected elements in solid samples of marine or fresh water sediment and similar matrices. Direct and slurry sampling, as well as dissolution techniques using typically milligram size samples (<10 mg), can employ this Standard Reference Material® in the user's procedures; all certified and reference values are based on measurements using a samples size of at least 0.7 mg. Techniques using large samples (100 mg) should use NIST-2702 Marine sediment - Trace elements.

Certified values

	Mass Fractions (mg/kg, unless noted as %)		Mass Fractions (mg/kg, unless noted as %)		Mass Fractions (mg/kg, unless noted as %)
Al	8.33 % ± 0.22 %	K	2.08 % 0.24 %	Sr	118 ± 18
As	45.5 ± 1.7	La	75.9 ± 3.0	Th	20.22 ± 0.74
Ba	416 ± 32	Mn	1734 48	Ti	0.880 % ± 0.046 %
Cd	0.811 ± 0.076	Na	0.693 % ± 0.019 %	U	8.99 ± 0.72
Ce	125.5 ± 5.0	Pb	130 ± 11	V	360 ± 13
Co	27.70 ± 0.50	Rb	130 ± 11	Zn	480 ± 22
Fe	7.38 % ± 0.32 %	Sb	5.62 ± 0.26		
Hg	0.474 ± 0.066	Sc	25.95 ± 0.68		

Reference and information values for for selected elements

NIST-4357

Ocean Sediment Powder — 85 g

Certified values

^{241}Am 1.1 x 10^{-3} Bq/g	^{228}Th 2.86 x 10^{-2} Bq/g
^{60}Co 3.20 x 10^{-1} Bq/g	^{232}Th 2.68 x 10^{-2} Bq/g
^{137}Cs 5.92 x 10^{-2} Bq/g	^{235}U 7.4 x 10^{-4} Bq/g
^{238}Pu 2.6 x 10^{-4} Bq/g	^{238}U 1.74 x 10^{-2} Bq/g
^{239}Pu+ ^{240}Pu 4.00 x 10^{-3} Bq/g	

NRCHISS-1

Sandy sediment - Trace elements — 100 g

Certified values

Ag 0.016 mg/kg	Cu 2.29 mg/kg	Ni 2.16 mg/kg
Al 0.73 %	Fe 0.246 %	Pb 3.13 mg/kg
As 0.801 mg/kg	K 0.332 %	Se 0.050 mg/kg
Be 0.129 mg/kg	Li 2.83 mg/kg	Sr 96.9 mg/kg
Ca 1.14 %	Mg 0.075 %	Ti 0.076 %
Cd 0.024 mg/kg	Mn 66.1 mg/kg	V 6.80 mg/kg
Cr 30.0 mg/kg	Na 0.373 %	Zn 4.94 mg/kg

Indicative values for Co, Hg, Mo Tl, Sb, Sn, U, V

NRCMESS-4

Marine Sediment - Trace Metals — 50 g

Certified values

Element	Mass fraction mg/kg	Element	Mass fraction mg/kg
Antimony	1.07 ± 0.16	Manganese	298 ± 14
Arsenic	21.7 ± 2.8	Nickel	42.8 ± 1.6
Beryllium	2.09 ± 0.28	Silver	0.161 ± 0.024
Cadmium	0.28 ± 0.04	Strontium	132 ± 8
Chromium	94.3 ± 1.8	Thallium	0.85 ± 0.10
Cobalt	13.0 ± 0.8	Tin	2.35 ± 0.12
Copper	32.9 ± 1.8	Uranium	3.4 ± 0.4
Lead	21.5 ± 1.2	Vanadium	216 ± 8
Lithium	65.3 ± 6.8	Zinc	147 ± 6
Element	**Mass fraction g/kg**		
Aluminum	79.1 ± 2.0	Phosphorus	1.04 ± 0.16
Calcium	13.1 ± 0.6	Potassium	23.8 ± 1.0
Chlorine	13.1 ± 4.4	Silicon	278 ± 20
Iron	37.9 ± 1.6	Sodium	12.6 ± 0.8
Magnesium	15.8 ± 1.2	Sulfur	1.58 ± 0.20
		Titanium	3.84 ± 0.22

Soil, sediment and sludge

Code	Product	Unit
NRCPACS-3	Harbour sediment - Trace elements and organotin compounds	50 g

Certified values

Element	Mass fraction mg/kg	Element	Mass fraction mg/kg
Antimony	14.6 ± 2.4	Manganese	425 ± 34
Arsenic	30.3 ± 2.3	Mercury	3.0 ± 0.5
Beryllium	1.07 ± 0.12	Nickel	39.9 ± 3.0
Cadmium	2.23 ± 0.13	Silver	1.37 ± 0.36
Chromium	91.6 ± 4.0	Strontium	268 ± 12
Copper	327 ± 14	Tin	22.0 ± 1.5
Lead	188 ± 7	Vanadium	129 ± 9
Lithium	31.9 ± 5.6	Zinc	379 ± 15

Element	Mass fraction g/100 g (%)	Element	Mass fraction g/100 g (%)
Aluminum	6.58 ± 0.17	Magnesium	1.47 ± 0.19
Calcium	1.90 ± 0.10	Phosphorus	0.091 ± 0.009
Iron	4.11 ± 0.11	Titanium	0.44 ± 0.05
Potassium	1.24 ± 0.07		

Compound	Mass fraction mg/kg (as Sn)	Compound	Mass fraction mg/kg (as Sn)
Dibutyltin	0.62 ± 0.04	Tributyltin	0.41 ± 0.04

NRCSOPH-1	Marine sediment - Dibutyltin and Tributyltin	12 g

Certified value

Dibutyltin	174 ± 9 ng/g (as Sn)	Tributyltin	125 ± 7 ng/g (as Sn)

NWHR-1	Harbour sediment - Trace metals	100 g

A harbour sediment collected from the mouth of the Humber River near Toronto, Ontario, Canada

Certified values

Aluminium (Al)	59250 µg/g	Nickel (Ni)	39.4 µg/g
Chromium (Cr)	126 µg/g	Lead (Pb)	139 µg/g
Copper (Cu)	79.9 µg/g	Vanadium (V)	84.1 µg/g
Iron (Fe)	30579 µg/g	Zinc (Zn)	1105 µg/g
Manganese (Mn)	549 µg/g		

Indicative values for As, B, Ba, Be, Bi, Ca, Cd, Ce, Co, Cs, Ga, Hg, K, La, Li, Mg, Mo, Na, Nb, P, Rb, Sb, Sc, Se, Sn, Sr, Ti, Tl, U, W, and Y, plus information values for recoverable and leachable element concentrations

NWTH-1	Harbour sediment - Trace elements	100 g

Sediment collected from Toronto Harbour, Ontario, Canada. Contains high levels of lead.

Certified values

Aluminium (Al)	55597 µg/g	Manganese (Mn)	583 µg/g
Chromium (Cr)	125 µg/g	Nickel (Ni)	45.5 µg/g
Copper (Cu)	103 µg/g	Vanadium (V)	89.2 µg/g
Iron (Fe)	35032 µg/g	Zinc (Zn)	1527 µg/g
Lead (Pb)	257 µg/g		

Indicative values for As, Cd, Co, Hg, Se and Tl

NWTH-2	Harbour sediment - Trace metals	100 g

Sediment collected from Toronto Harbour, Ontario, Canada. Contains high levels of lead.

Aluminium (Al)	64799 µg/g	Lead (Pb)	194 µg/g
Arsenic (As)	8.70 µg/g	Manganese (Mn)	584 µg/g
Cadmium (Cd)	5.22 µg/g	Mercury (Hg)	0.620 µg/g
Chromium (Cr)	123 µg/g	Nickel (Ni)	43.0 µg/g
Cobalt (Co)	15.7 µg/g	Selenium (Se)	0.825 µg/g
Copper (Cu)	124 µg/g	Vanadium (V)	89.2 µg/g
Iron (Fe)	35361 µg/g	Zinc (Zn)	908 µg/g

Indicative values for Ag, B, Ba, Be, Bi, Ca, Ce, Cs, Ga, K, La, Li, Mg, Mo, Na, Nb, P, Rb, Sb, Sc, Sn, Sr, Ti, Tl, U, W, and Y, plus information values for recoverable and leachable element concentrations

RTC-CRM361-100G	TPH - Sea Sediment 1	100 g

Certified value

Lot 011244

TPH (Diesel range organics)	694.99 mg/kg

LGC6187	River sediment - Extractable metals	80 g

The extractable/leachable metal content refers to metals soluble in a hot mixture of nitric and hydrochloric acids using methods based on ISO 11466 (1995).

Certified values

As	24.0 mg/kg	Hg	1.4 mg/kg	Sn	6.8 mg/kg
Cd	2.7 mg/kg	Mn	1240 mg/kg	V	38.3 mg/kg
Cr	84.0 mg/kg	Ni	34.7 mg/kg	Zn	439 mg/kg
Cu	83.6 mg/kg	Pb	77.2 mg/kg		
Fe	23600 mg/kg	Se	1.2 mg/kg		

Code	Product	Unit

LGC6188 — River sediment - PAHs — 30 g

Collected from a monitoring station lagoon on the River Elbe close to Czech-German border.

Assessed values

Acenaphthene	0.07 mg/kg	Dibenzo(*ah*)anthracene	0.13 mg/kg
Anthracene	0.36 mg/kg	Fluoranthene	1.79 mg/kg
Chrysene	0.83 mg/kg	Fluorene	0.12 mg/kg
Benzo(*a*)anthracene	0.83 mg/kg	Indeno(1,2,3-*cd*)pyrene	0.37 mg/kg
Benzo(*b*)fluoranthene	0.82 mg/kg	Naphthalene	0.22 mg/kg
Benzo(*k*)fluoranthene	0.50 mg/kg	Phenanthrene	1.04 mg/kg
Benzo(*a*)pyrene	0.65 mg/kg	Pyrene	1.48 mg/kg
Benzo(*ghi*)perylene	0.36 mg/kg		

Indicative value for Acenaphthylene

LGC6189 — River sediment - Extractable metals — 30 g

The river sediment was collected from a monitoring station lagoon on the river Elbe close to the Czech-German Border, Czech Republic. Assessed values for extractable metals precisely following the ISO11466 (1995) method. Only those metals that reached a plateau of concentration after two hours reflux were characterised.

Assessed values

As	26 mg/kg	Cu	87 mg/kg	Ni	34 mg/kg
Cd	3.3 mg/kg	Mn	1120 mg/kg	Pb	87 mg/kg
Cr	93 mg/kg	Mo	1.2 mg/kg	Zn	460 mg/kg

Indicative values for Ba, Se and constituents.

BCR-280R — Lake sediment - Trace elements — 30 g

Certified values

As	33.4 mg/kg	Cr	126 mg/kg	Ni	69 mg/kg
Cd	0.85 mg/kg	Cu	53 mg/kg	Zn	224 mg/kg
Co	16.8 mg/kg	Hg	1.46 mg/kg		

BCR-646 — Freshwater sediment - Butyltin and phenyltin — 40 g

Certified values

TBT	480 µg/kg	MBT	610 µg/kg	DPhT	36 µg/kg
DBT	770 µg/kg	TPhT	29 µg/kg	MPhT	69 µg/kg

BCR-684 — River sediment - Phosphorous — 35 g

Extractable phosphorous in sediment following a five-step extraction procedure

NaOH-extractable P	550 mg/kg	Organic P	209 mg/kg
HCl-extractable P	536 mg/kg	Conc.HCl-extract. P	1373 mg/kg
Inorganic P	1113 mg/kg		

BCR-701 — Sediment - Extractable trace elements (3 step extraction) — 20 g

Certified values

Step 1

Cd	7.34 mg/kg	Cu	49.3 mg/kg	Pb	3.18 mg/kg
Cr	2.26 mg/kg	Ni	15.4 mg/kg	Zn	205 mg/kg

Step 2

Cd	3.77 mg/kg	Cu	124 mg/kg	Pb	126 mg/kg
Cr	45.7 mg/kg	Ni	26.6 mg/kg	Zn	114 mg/kg

Step 3

Cd	0.27 mg/kg	Cu	55.2 mg/kg	Pb	9.3 mg/kg
Cr	143 mg/kg	Ni	15.3 mg/kg	Zn	45.7 mg/kg

ERM-CC020 — Contaminated river sediment - Trace elements — 50 g

Aqua regia extractable elements according to ISO 11466

Arsenic (As)	56.6 ± 2.6 mg/kg	Lead (Pb)	255 ± 11 mg/kg
Cadmium (Cd)	20.8 ± 0.5 mg/kg	Mercury (Hg)	27.4 ± 0.6 mg/kg
Chromium (Cr)	290 ± 8 mg/kg	Nickel (Ni)	158 ± 6 mg/kg
Cobalt (Co)	32.8 ± 1.5 mg/kg	Vanadium (V)	53 ± 4 mg/kg
Copper (Cu)	560 ± 11 mg/kg	Zinc (Zn)	2030 ± 40 mg/kg

Soil, sediment and sludge

Code	Product	Unit

NIST-1939a — River sediment - PCBs and chlorinated pesticides — 50 g

Certified Concentrations (Mass Fractions for Selected PCB Congeners

		µg/kg
PCB 52	2,2',5,5'-Tetrachlorobiphenyl	3691 ± 68
PCB 56	2,3,3',4'-Tetrachlorobiphenyl	355 ± 14
PCB 66	2,3',4,4'-Tetrachlorobiphenyl	556 ± 25
PCB 87	2,2'3,4,5'-Pentachlorobiphenyl	166 ± 21
PCB 92	2,2',3,5,5'-Pentachlorobiphenyl	386 ± 27
PCB 95	2,2'3,5',6-Pentachlorobiphenyl	859 ± 29
PCB 101	2,2',4,5,5'-Pentachlorobiphenyl	476 ± 42
PCB 110	2,3,3',4',6-Pentachlorobiphenyl	1008 ± 118
PCB 112	2,3,3',5,6-Pentachlorobiphenyl	33.5 ± 3.1
PCB 153	2,2',4,4',5,5'-Hexachlorobiphenyl	357 ± 92
132	2,2',3,3',4,6'-Hexachlorobiphenyl	
PCB 156	2,3,3',4,4',5-Hexachlorobiphenyl	40.7 ± 4.4
PCB 167	2,3',4,4',5,5'-Hexachlorobiphenyl	17.9 ± 2.0
PCB 172	2,2',3,3',4,5,5'-Heptachlorobiphenyl	16.7 ± 1.5
PCB 175	2,2',3,3',4,5',6-Heptachlorobiphenyl	6.47 ± 0.23
PCB 177	2,2'3,3',4',5,6-Heptachlorobiphenyl	73.3 ± 6.8
PCB 180	2,2',3,4,4',5,5'-Heptachlorobiphenyl	167 ± 11
PCB 8	2,4'-Dichlorobiphenyl	5049 ± 294
PCB 18	2,2',5-Trichlorobiphenyl	2126 ± 264
PCB 28	2,4,4'-Trichlorobiphenyl	1676 ± 91
PCB 31	2,4',5-Trichlorobiphenyl	5698 ± 135
PCB 44	2,2'3,5'-Tetrachlorobiphenyl	766 ± 53
PCB 49	2,2'4,5'-Tetrachlorobiphenyl	3314 ± 317
193	2,3,3',4',5,5',6-Heptachlorobiphenyl	
PCB 189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	3.40 ± 0.47
PCB 191	2,3,3',4,4',5',6-Heptachlorobiphenyl	2.92 ± 0.15
PCB 194	2,2',3,3',4,4',5,5'-Octachlorobiphenyl	41.1 ± 5.7
PCB 199a	2,2',3,3',4,5,5',6'-Octachlorobiphenyl	7.61 ± 0.92
PCB 201a	2,2',3,3',4,5,5',6'-Octachlorobiphenyl	18.9 ± 1.0
PCB 202	2,2',3,3',5,5',6,6'-Octachlorobiphenyl	18.9 ± 2.8
PCB 206	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	33.4 ± 2.4
PCB 207	2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl	3.96 ± 0.22
PCB 208	2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl	13.1 ± 0.78
PCB 209	2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl	8.32 ± 0.60

Indicative values for further PCB congeners, chlorinated pesticides and PAHs

NIST-4350b — River sediment - Radioactivity — 85 g

Certified values

^{241}Am 1.5 x 10^{-4} Bq/g	^{152}Eu 2.90 x 10^{-2} Bq/g	^{238}Pu 1.3 x 10^{-5} Bq/g
^{60}Co 4.64 x 10^{-3} Bq/g	^{154}Eu 3.78 x 10^{-3} Bq/g	^{239}Pu + ^{240}Pu 5.08 x 10^{-4} Bq/g
^{137}Cs 2.90 x 10^{-2} Bq/g	^{226}Ra 3.58 x 10^{-2} Bq/g	

NIST-4354 — Lake Sediment Powder — 25 g

Certified values

^{241}Am 0.0011 Bq/g	^{228}Th 0.0286 Bq/g	^{238}Pu 0.00026 Bq/g
^{60}Co 0.320 Bq/g	^{232}Th 0.0268 Bq/g	^{239}Pu + ^{240}Pu 0.00400 Bq/g
^{137}Cs 0.0592 Bq/g	^{235}U 0.00075 Bq/g	
^{90}Sr 1.09 Bq/g	^{238}U 0.0174 Bq/g	

NIST-RM 8704 — Buffalo river sediment - Metals — 50 g

This Reference Material (RM) is intended primarily for use in the analysis of sediments, soils, or materials of a similar matrix. A unit of RM 8704 consists of 50 g of freeze-dried, radiation-sterilized, homogenized, river sediment that was collected from the Buffalo River in the area of the Ohio Street Bridge, Buffalo, New York.

Reference values are given for 25 trace elements however these values are noncertified values that are the best estimate of the true value; the values do not meet the NIST criteria for certification and are provided with associated uncertainties that may not include all sources of uncertainty.

NWSUD-1 — Lake sediment - Trace metals — 100 g

Sediment collected from Lake Ramsay in Sudbury, Ontario, Canada, a well-known mining area. It has high cobalt, copper and nickel levels, but low mercury levels.

Certified values

Aluminium (Al)	58049 µg/g	Lead (Pb)	56.3 µg/g
Chromium (Cr)	81.2 µg/g	Manganese (Mn)	578 µg/g
Cobalt (Co)	44.2 µg/g	Nickel (Ni)	936 µg/g
Copper (Cu)	561 µg/g	Vanadium (V)	67.8 µg/g
Iron (Fe)	32688 µg/g	Zinc (Zn)	768 µg/g

Indicative values for As, B, Ba, Be, Bi, Ca, Cd, Ce, Cs, Ga, Hg, K, La, Li, Mg, Mo, Na, Nb, P, Rb, Sb, Sc, Se, Sn, Sr, Ti, Tl, U, W, and Y, plus information values for recoverable and leachable element concentrations

Code	Product	Unit
NWWQB-1	Lake sediment - Trace elements Sediment collected from Lake Ontario, Canada Certified values Aluminium (Al) ... 78134 µg/g Arsenic (As) ... 23.00 µg/g Cobalt (Co) ... 20.1 µg/g Copper (Cu) ... 79.6 µg/g Iron (Fe) ... 47358 µg/g Lead (Pb) ... 83.7 µg/g Manganese (Mn) ... 2237 µg/g Mercury (Hg) ... 1.09 µg/g Nickel (Ni) ... 61.5 µg/g Selenium (Se) ... 1.02 µg/g Vanadium (V) ... 129 µg/g Zinc (Zn) ... 275 µg/g Indicative values for Ag, B, Ba, Be, Bi, Ca, Cd, Ce, Cr, Cs, Ga, K, La, Li, Mg, Mo, Na, Nb, P, Rb, Sb, Sc, Sn, Sr, Ti, Tl, U, W and Y, plus information values for recoverable and leachable element concentrations	100 g
NWWQB-3	Lake sediment - Trace elements A blend of sediments collected from the heavy industrial areas of Hamilton Harbour and Lake Ontario, Canada. Certified values Aluminium (Al) ... 52700 µg/g Arsenic (As) ... 18.8 µg/g Cobalt (Co) ... 15.3 µg/g Copper (Cu) ... 81.6 µg/g Iron (Fe) ... 60000 µg/g Lead (Pb) ... 240 µg/g Manganese (Mn) ... 1264 µg/g Mercury (Hg) ... 2.75 µg/g Nickel (Ni) ... 52.0 µg/g Selenium (Se) ... 1.15 µg/g Vanadium (V) ... 90.7 µg/g Zinc (Zn) ... 1396 µg/g Indicative values for Ag, B, Ba, Be, Bi, Ca, Cd, Ce, Cr, Cs, Ga, K, La, Li, Mg, Mo, Na, Nb, P, Rb, Sb, Sc, Sn, Sr, Ti, Tl, U, W and Y, plus information values for recoverable and leachable element concentrations	100 g
RTC-CLNSED2-100G	Clean Sediment #2 Metals analysis Al ... 3540 mg/kg As ... 2.0 mg/kg Ba ... 50 mg/kg Ca ... 20.5 meq/L Cation exchange capacity ... 13.9 meq/100g Fe ... 3160 mg/kg Hg ... 0.03 mg/kg K ... 5.72 meq/L Mg ... 228 meq/L Mn ... 97.3 mg/kg Na ... 38.7 meq/L Se ... 0.40 mg/kg V ... 16.0 mg/kg Zn ... 21.3 mg/kg Soil analysis Carbon (total) ... 1770 µg/g Carbonate (total as $CaCO_3$) ... 4.6 % Conductivity (25°C) ... 14.9 mmhos/cm Exchangable acidity ... 11.3 meq/100g Cation exchange capacity ... 13.9 meq/100g Organic matter ... 1.85 % pH ... 8.4 units Solids ... 86.0 % Sulfate (soluble in Water) ... 16700 mg/kg Sulfur (total) ... 12.7 % Wet chemistry Nitrate as N, (soluble in water) ... 34.3 mg/kg Nitrogen, ammonia (KCl) ... 4.7 mg/kg Nitrogen, total Kjeldahl ... 0.13 % Phosphorus (extractable) ... 1.0 mg/kg Phosphorus (total) ... 0.02 %	100 g
RTC-CLNSED2-250G	Clean Sediment #2, 250g	250 g
RTC-CNS301-50G	Trace Elements on Fresh Water Sediment Lot 002462 Certified values Ag ... 2.35 mg/kg Al ... 10900 mg/kg As ... 14.6 mg/kg Ba ... 137 mg/kg Cd ... 35.6 mg/kg Co ... 26.3 mg/kg Cr ... 30.7 mg/kg Cu ... 44.2 mg/kg Fe ... 12400 mg/kg Hg ... 0.815 mg/kg Mn ... 187 mg/kg Mo ... 38.9 mg/kg Ni ... 28.6 mg/kg Sb ... 20.1 mg/kg Se ... 8.24 mg/kg Sn ... 2.48 mg/kg V ... 88.4 mg/kg Zn ... 89.0 mg/kg COD ... 10.7 mg/kg Nitrogen, Kjeldahl ... 0.627 g/kg P (total) ... 0.348 g/kg Reference values Be ... 26.1 mg/kg	50 g

Soil, sediment and sludge

Code	Product	Unit
RTC-CNS329-50G	PCBs and PBDEs on Fresh Water Sandy Loam Sediment	50 g

Lot 010432

Certified values

PCB 28	54.1 µg/kg	PCB (total)	1330 µg/kg
PCB 52	230 µg/kg	PBDE 47	149 µg/kg
PCB 101	390 µg/kg	PBDE 99	192 µg/kg
PCB 118	175 µg/kg	PBDE 100	108 µg/kg
PCB 138	226 µg/kg	PBDE 153	160 µg/kg
PCB 153	133 µg/kg	PBDE 154	108 µg/kg
PCB 180	104 µg/kg	PBDE 183	52.6 µg/kg

Reference values

PBDE 209	81.7 µg/kg

Code	Product	Unit
RTC-CNS392-50G	Trace Elements on Fresh Water Sediment	50 g

Lot 011295

Certified values

Ag	15.8 mg/kg	Hg	12.7 mg/kg
As	6.49 mg/kg	Mn	6604 mg/kg
Ba	54.8 mg/kg	Mo	14.5 mg/kg
Be	14.3 mg/kg	Ni	32.9 mg/kg
Cd	21.5 mg/kg	Pb	121 mg/kg
Co	9.16 mg/kg	Sb	12.0 mg/kg
Cr	36.6 mg/kg	Se	8.59 mg/kg
Cu	146 mg/kg	V	41.9 mg/kg
Fe	7880 mg/kg	Zn	81.7 mg/kg
COD	0.619 g/kg	Kjeldahl-Nitrogen	0.185 g/kg
Cl^-	0.255 g/kg	P (total)	0.137 g/kg

Reference values

Al	14100 mg/kg	Ti	25.9 mg/kg

Code	Product	Unit
RTC-CRM015-50G	Trace Metals - Fresh Water Sediment 2	50 g

Lot FF15

Certified values

Al	9200 ± 976 mg/kg	K	2070 ± 127 mg/kg
As	6.60 ± 0.433 mg/kg	Mg	13600 ± 345 mg/kg
Ba	83.0 ± 3.31 mg/kg	Mn	183 ± 4.52 mg/kg
Ca	23500 ± 688 mg/kg	Na	401 ± 47.4 mg/kg
Co	6.04 ± 0.142 mg/kg	Ni	17.5 ± 0.520 mg/kg
Cr (total)	14.3 ± 1.44 mg/kg	Pb	15.0 ± 0.539 mg/kg
Cu	16.1 ± 0.585 mg/kg	V	22.1 ± 1.84 mg/kg
Fe	17100 ± 717 mg/kg	Zn	69.9 ± 2.82 mg/kg
Hg	0.221 ± 0.00619 mg/kg	Total cyanide	6.04 ± 0.774 mg/kg

Informational values

Ag	0.237 mg/kg	Se	0.800 mg/kg
B	8.60 mg/kg	Sn	<5.00 mg/kg
Bi	0.300 mg/kg	Tl	1.00 mg/kg
Cd	0.520 mg/kg	Ti	80.0 mg/kg
Mo	1.16 mg/kg		

Code	Product	Unit
RTC-CRM016-50G	Trace Metals - Fresh Water Sediment 3	50 g

Lot BE016

Certified values

Al	8920 ± 657 mg/kg	Hg	0.158 ± 0.0219 mg/kg
As	7.76 ± 0.439 mg/kg	K	1960 ± 141 mg/kg
Ba	79.3 ± 2.82 mg/kg	Mg	13200 ± 332 mg/kg
Be	0.490 ± 0.0587 mg/kg	Mn	180 ± 3.65 mg/kg
Ca	23500 ± 688 mg/kg	Na	292 ± 15.7 mg/kg
Cd	0.470 ± 0.0761 mg/kg	Ni	16.7 ± 0.498 mg/kg
Co	5.96 ± 0.243 mg/kg	Pb	14.1 ± 0.657 mg/kg
Cr (total)	14.5 ± 1.36 mg/kg	V	22.5 ± 1.62 mg/kg
Cu	16.1 ± 0.585 mg/kg	Zn	69.7 ± 2.11 mg/kg
Fe	16800 ± 517 mg/kg		

Informational values

Trace metal acid digestion by Aqua Regia (NEN 57, NEN 64.. series)

Al	21900 mg/kg	Cr	33.3 mg/kg
Ba	128 mg/kg	K	4080 mg/kg
Cd	0.30 mg/kg		

Informational values

Trace metal acid digestion by USEPA 3050B

Ag	0.7 mg/kg	Si	347 mg/kg
B	13.0 mg/kg	Sr	61 mg/kg
Mo	0.97 mg/kg	Tl	4.6 mg/kg
Se	1.0 mg/kg		

RTC-CRM104-50G	PAH - Sediment 1	50 g

The certified values were determined by USEPA SW846 (3rd edition) Methods 3540A (Soxhlet extraction) and 8270C (Semivolatile organics by GC/MS).

Certified values

Lot 016136

Naphthalene	2790 µg/kg	2,4-Dimethylphenol	3020 µg/kg
Nitrobenzene	2470 µg/kg	Dimethyl phthalate	2740 µg/kg
1,2,4-Trichlorobenzene	9430 µg/kg	2,4-Dinitrophenol	3050 µg/kg
Acenaphthene	8580 µg/kg	2,4-Dinitrotoluene (2,4-DNT)	5060 µg/kg
Anthracene	5950 µg/kg	2,6-Dinitrotoluene (2,6-DNT)	5730 µg/kg
Benzo(a)anthracene	1690 µg/kg	Di-n-octyl phthalate	12600 µg/kg
Benzo(a)pyrene	3020 µg/kg	bis(2-Ethylhexyl) phthalate (DEHP)	10700 µg/kg
Benzo(b)fluoranthene	4740 µg/kg	Fluoranthene	453 µg/kg
Benzo(k)fluoranthene	1050 µg/kg	Fluorene	8660 µg/kg
4-Bromophenyl phenyl ether	1860 µg/kg	Hexachlorobenzene	5480 µg/kg
Butyl benzyl phthalate	1550 µg/kg	Hexachlorocyclopentadiene	6550 µg/kg
4-Chloro-3-methylphenol	2060 µg/kg	Isophorone	9060 µg/kg
bis(2-Chloroethoxy) methane	7090 µg/kg	2-Methyl-4,6-dinitrophenol	7920 µg/kg
bis(2-Chloroisopropyl) ether	6960 µg/kg	2-Methylnaphthalene	3400 µg/kg
2-Chloronapthalene	4450 µg/kg	2-Methylphenol (o-Cresol)	8190 µg/kg
2-Chlorophenol	8500 µg/kg	2-Methylphenol (p-Cresol)	7810 µg/kg
4-Chlorophenyl phenylether	10700 µg/kg	3+4-Methylphenol (m+p-Cresol)	9270 µg/kg
Dibenzofuran	7240 µg/kg	2-Nitrophenol	6590 µg/kg
Di-n-butyl phthalate	11700 µg/kg	4-Nitrophenol	6810 µg/kg
1,2-Dichlorobenzene	7210 µg/kg	n-Nitrosodimethylamine	1720 µg/kg
1,3-Dichlorobenzene	3900 µg/kg	n-Nitroso-di-n-propylamine	6510 µg/kg
1,4-Dichlorobenzene	2470 µg/kg	Phenanthrene	5570 µg/kg
Hexachlorobutadiene	5430 µg/kg	Phenol	7930 µg/kg
Hexachloroethane	4510 µg/kg	Pyrene	3040 µg/kg
2,6-Dinitrophenol	4060 µg/kg	2,4,5-Trichlorophenol	10100 µg/kg
Diethyl phthalate	2240 µg/kg		

RTC-CRM132-10G	Nitroaromatics/Nitrosamines - Sediment 1	10 g

Lot LRAA0277

Nitrobenzene	3,520 ± 188 µg/Kg	4-Amino-2,6-dinitrotoluene	969 ± 51.8 µg/Kg
1,3-Dinitrobenzene (1,3-DNB)	2,710 ± 145 µg/Kg	RDX	2,150 ± 115 µg/Kg
2,4-Dinitrotoluene (2,4-DNT)	9,100 ± 406 µg/Kg	2-Nitrotoluene	5,150 ± 275 µg/Kg
2,6-Dinitrotoluene (2,6-DNT)	4,600 ± 246 µg/Kg	3-Nitrotoluene	8,360 ± 447 µg/Kg
Nitroglycerin	6,830 ± 365 µg/Kg	4-Nitrotoluene	3,500 ± 187 µg/Kg
2-Amino-4,6-dinitrotoluene	2,810 ± 150 µg/Kg	HMX	1,490 ± 79.9 µg/Kg

Soil, sediment and sludge

Code	Product	Unit
RTC-CRM640-25G	VOCs - Sediment 2	25 g

Certified values

Lot 014727

Acetone	20200 µg/kg	Isopropylbenzene	4430 µg/kg
Benzene	4610 µg/kg	Methyl bromide	1410 µg/kg
Bromobenzene	3650 µg/kg	Methyl chloride	4400 µg/kg
Bromodichloromethane	7950 µg/kg	Methylene chloride	9130 µg/kg
Bromoform	7100 µg/kg	4-Methyl-2-pentanone (MIBK)	13900 µg/kg
2-Butanone (Methyl ethyl ketone, MEK)	18400 µg/kg	Methyl tert-butyl ether (MTBE)	5450 µg/kg
Carbon tetrachloride	8640 µg/kg	Naphthalene	6090 µg/kg
Chlorobenzene	3420 µg/kg	Styrene	6370 µg/kg
Chloroethane	2960 µg/kg	1,1,1,2-Tetrachloroethane	3220 µg/kg
1,2-Dibromo-3-chloropropane	7730 µg/kg	1,1,2,2-Tetrachloroethane	4110 µg/kg
Dibromochloromethane	2580 µg/kg	Toluene	2700 µg/kg
Dibromomethane	7010 µg/kg	1,2,4-Trichlorobenzene	3340 µg/kg
1,2-Dichlorobenzene	7440 µg/kg	1,1,1-Trichloroethane	7650 µg/kg
1,3-Dichlorobenzene	4020 µg/kg	Trichloroethene	7620µg/kg
1,4-Dichlorobenzene	2370 µg/kg	Trichlorofluoromethane	5340 µg/kg
1,1-Dichloroethane	6390 µg/kg	1,2,3-Trichloropropane	7330 µg/kg
1,2-Dichloroethane	8500 µg/kg	1,2,4-Trimethylbenzene	13700µg/kg
1,1-Dichloroethylene	7200 µg/kg	1,3,5-Trimethylbenzene	16300µg/kg
cis-1,2-Dichloroethylene	5460 µg/kg	Vinyl chloride	8370 µg/kg
trans-1,3-Dichloropropene	2370 µg/kg	m+p-Xylene	11500 µg/kg
trans-1,2-Dichloroethylene	6360 µg/kg	o-Xylene	2790 µg/kg
Ethylbenzene	5490 µg/kg	Xylene	14500 µg/kg
2-Hexanone	15800 µg/kg		

RTC-CRM750-30G	Cyanide - Sediment	30 g

Lot 017081

Cyanide 65.3 ± 7.92 mg/Kg

RTC-CRM775-30G	Sulfide - Sediment	30 g

Lot 016383

Sulfide 41.3 ± 16.7 mg/Kg

RTC-CRM850-50G	Toxaphene - Sediment 1	50 g

Assigned value

Toxaphene (Chlorinated camphene) 198 ug/Kg

RTC-CRM851-50G	OP Pesticides - Sediment 1	50 g

Lot 002536

Certified values

Azinphos-methyl (Guthion)	1.76 mg/kg	Parathion, ethyl	3.23 mg/kg
Chlorfenvinphos	1.76 mg/kg	Ronnel	2.14 mg/kg
Diazinon	0.217 mg/kg	Tetrachlorvinphos	0.673 mg/kg
Malathion	4.14 mg/kg	Disulfoton	5.18 mg/kg
Parathion, methyl	5.80 mg/kg		

RTC-CRM852-50G	Chlordane - Sediment 1	50 g

Certified value

Lot 002531

Chlordane (total) 235 µg/kg

Soil

LGC6115	Soil - PCBs and PAHs	50 g

LGC6115 is a contaminated sandy loam soil sourced from the Czech Republic. It has been produced to meet the demands of laboratories seeking to validate methods for accreditation to the UK Environment Agency's MCERTS soil testing scheme or similar schemes worldwide.

Certified values

PCB 101	93 µg/kg	Benzo(a)anthracene	36 mg/kg
PCB 118	116 µg/kg	Benzo(a)pyrene	0.13 mg/kg
Phenanthrene	178 mg/kg	Benzo(ghi)perylene	0.33 mg/kg
Fluoranthene	312 mg/kg		

Assesed values

PCB 138	16 µg/kg	PCB 153	19 µg/kg	PCB 180	9.6 µg/kg

Code	Product	Unit

LGC6145 — Contaminated clay loam soil - Extractable metals, PAHs and inorganics — 50 g

LGC6145 is a contaminated clay – loam soil sourced from the Czech Republic. It has been produced to meet the demands of laboratories seeking to validate methods for accreditation to the UK Environment Agency's MCERTS soil testing scheme or similar schemes worldwide.

Certified values

As	38.7 mg/kg	Pb	45.1 mg/kg
Cd	0.65 mg/kg	Se	1.81 mg/kg
Cr	47.6 mg/kg	V	53.9 mg/kg
Cu	62.2 mg/kg	Zn	137 mg/kg
Ni	39.0 mg/kg		

Assessed values

Naphthalene	9.3 mg/kg	Benzo(*b*)fluoranthene	12 mg/kg
Acenaphthylene	0.79 mg/kg	Indeno(1,2,3-*cd*)pyrene	0.97 mg/kg
Phenanthrene	325 mg/kg	Water soluble chloride	65 mg/kg
Anthracene	8.4 mg/kg	Water soluble sulfate	5.3 g/L
Chrysene	45 mg/kg		

Indicative value for Acenaphthene, Fluorene, Fluoranthene, Pyrene, Benzo(*a*)anthracene, Benzo(*k*)fluoranthene, Benzo(*a*)pyrene, Dibenzo(*a,h*)anthracene, Benzo(*ghi*)perylene, Easily liberated cyanide and Total cyanide, Total sulfur, Al_2O^3, CaO, Fe_2O_3, K_2O, MgO, SO_3, SiO_2, TiO_2, Soil textural class (UK), Loss on drying, pH, Loss on ignition, Quartz SiO_2, Kaoline clay, Muscovite clay

LGCQC3013 — Loamy sand soil 2 - Total Petroleum Hydrocarbons — 100 g

Quality control reference material

The method used for the determination of TPH was based on the ISO 16703:2004(E) Standard Soil Quality-Determination of content of hydrocarbons in the range of C10 to C40 by gas chromatography.

Indicative values

Textural classification

Sand: 2.00-0.063 mm	87 %
Silt: 0.063 – 0.002	6 %
Clay: < 0.002 mm	7 %

Constituent

Total Petroleum Hydrocarbons (C10-C40) ..... 4100 mg/kg

BCR-142R — Light sandy soil - Trace elements — 40 g

Certified values

Cd	0.34 mg/kg	Hg	0.067 mg/kg	Pb	40.2 mg/kg
Co	12.1 mg/kg	Mn	970 mg/kg		
Cu	69.7 mg/kg	Ni	64.5 mg/kg		

Indicative values for Cr, Zn

Aqua regia soluble content

Certified values

Cd	0.25 mg/kg	Pb	25.7 mg/kg
Ni	61.1 mg/kg	Zn	93.3 mg/kg

Indicative values for Co, Cr, Cu, Mn

BCR-461 — Clay - Fluorine — 30 g

Certified value

F ..... 568 mg/kg ± 60 mg/kg

BCR-481 — Industrial soil - PCBs — 25 g

Compound (IUPAC Code)	Certified value mg/kg	Uncertainty mg/kg
PCB 101	37	3
PCB 118	9.4	0.7
PCB 128	9.1	0.8
PCB 149	97	7
PCB 153	137	7
PCB 156	7.0	0.5
PCB 170	52	4
PCB 180	124	6

BCR-524 — Contaminated industrial soil - PAHs — 40 g

Compound	Certified value mg/kg	Uncertainty mg/kg
Pyrene	173	11
Benzo(a)anthracene	22.5	1.8
Benzo(a)pyrene	8.6	0.5
Benzo(e)pyrene	10.6	1.4
Benzo(b)fluoranthene	13.5	1.6
Benzo(k)fluoranthene	6.2	0.7
Benzo(b)naphtho(2,1-d)thiophene	3.8	0.6
Indeno(1,2,3-cd)pyrene	5.1	0.4
Pentachlorophenol	0.034	0.005

Soil, sediment and sludge

Code	Product	Unit

BCR-529 — Industrial sandy soil - PCDDs and PCDFs — 50 g

Compound	Certified value mg/kg	Uncertainty mg/kg
1,2,3-Trichlorobenzene	0.63	0.11
3,4-Dichlorophenol	0.23	0.04
2,4,5-Trichlorophenol	1.51	0.10
Pentachlorophenol	0.23	0.04
	µg/kg	µg/kg
2,3,7,8-TCDD	4.5	0.6
1,2,3,7,8-PeCDD	0.44	0.05
1,2,3,4,7,8-HxCDD	1.2	0.3
1,2,3,6,7,8-HxCDD	5.4	0.9
1,2,3,7,8,9-HxCDD	3.0	0.4
2,3,7,8-TCDF	0.078	0.013
1,2,3,7,8-PeCDF	0.14	0.03
2,3,4,7,8-PeCDF	0.36	0.07
1,2,3,4,7,8-HxCDF	3.4	0.5
1,2,3,6,7,8-HxCDF	1.09	0.15
1,2,3,7,8,9-HxCDF	0.022	0.010
2,3,4,6,7,8-HxCDF	0.37	0.04

BCR-530 — Industrial clay soil - Dioxins and furans — 50 g

Compound	Certified value mg/kg	Uncertainty mg/kg
1,2,3-Trichlorobenzene	15	4
3,4-Dichlorophenol	6.0	0.5
2,4,5-Trichlorophenol	40	7
Pentachlorophenol	0.47	0.08
	µg/kg	µg/kg
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.061	0.011
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.022	0.003
1,2,3,7,8-Pentachlorodibenzofuran	0.24	0.04
2,3,4,7,8-Pentachlorodibenzofuran	0.62	0.07
1,2,3,4,7,8-Hexachlorodibenzofuran	0.321	0.015
1,2,3,6,7,8-Hexachlorodibenzofuran	0.19	0.03
2,3,4,6,7,8-Hexachlorodibenzofuran	0.126	0.012

BCR-700 — Organic rich soil - Extractable trace elements — 40 g

Certified values

EDTA

Cd 65.2 mg/kg	Cu 89.4 mg/kg	Pb 103 mg/kg
Cr 10.1 mg/kg	Ni 53.2 mg/kg	Zn 510 mg/kg

Acetic acid

Cd 67.5 mg/kg	Cu 36.3 mg/kg	Pb 4.85 mg/kg
Cr 19 mg/kg	Ni 99 mg/kg	Zn 719 mg/kg

ERM-CC007A — Soil - Pesticides — 103 g

Certified values

alpha-HCH 219 ± 23 µg/kg	4,4'-DDE 380 ± 60 µg/kg
beta-HCH 1570 ± 210 µg/kg	2,4'-DDT 340 ± 50 µg/kg
gamma-HCH 21.4 ± 2.6 µg/kg	4,4'-DDT 960 ±140 µg/kg

ERM-CC008 — Soil - Pentachlorophenol — 30 g

Certified value

Pentachlorophenol... 2.04 mg/kg

ERM-CC009 — Soil - Pentachlorophenol — 30 g

Certified value

Pentachlorophenol... 2.91 mg/kg

ERM-CC010 — Soil - AOX (DIN 38414 Part 18) — 5.7 g

Certified value

AOX 1349.4 mg/kg

AOX - Absorbed Organically Bound Halogens

ERM-CC011 — Soil - AOX (DIN 38414 Part 18) — 4.2 g

Certified value

AOX 80.4 mg/kg

AOX - Absorbed Organically Bound Halogens

Code	Product	Unit

ERM-CC018 — Contaminated sandy soil - Trace elements — 55 g

Aqua regia extractable elements according to ISO 11466

Arsenic (As)	22.9 ± 1.9 mg/kg	Lead (Pb)	289 ± 10 mg/kg
Cadmium (Cd)	5.4 ± 0.5 mg/kg	Mercury (Hg)	1.38 ± 006 mg/kg
Chromium (Cr)	129 ± 6 mg/kg	Nickel (Ni)	25.8 ± 1.8 mg/kg
Cobalt (Co)	5.9 ± 0.4 mg/kg	Vanadium (V)	19.4 ± 1.0 mg/kg
Copper (Cu)	80 ± 4 mg/kg	Zinc (Zn)	313 ± 13 mg/kg

ERM-CC141 — Loam soil - Trace elements — 24 g

Certified values

Total content

As	9.9 ± 1.5 mg/kg	Cu	14.4 ± 1.4 mg/kg	Pb	41 ± 4 mg/kg
Cd	0.35 ± 0.05 mg/kg	Hg	0.083 ± 0.017 mg/kg	Zn	57 ± 4 mg/kg
Co	8.5 ± 0.5 mg/kg	Mn	464 ± 18 mg/kg		
Cr	86 ± 8 mg/kg	Ni	26.4 ± 2.4 mg/kg		

Aqua regia extractable content according to ISO 11466

As	7.5 ± 1.4 mg/kg	Cu	12.4 ± 0.9 mg/kg	Pb	32.2 ± 1.4 mg/kg
Cd	0.25 ± 0.04 mg/kg	Hg	0.080 ± 0.008 mg/kg	Zn	50 ± 4 mg/kg
Co	7.9 ± 0.9 mg/kg	Mn	387 ± 17 mg/kg		
Cr	31 ± 4 mg/kg	Ni	21.9 ± 1.6 mg/kg		

ERM-CC690 — Calcareous soil - Trace elements — 70 g

Certified values

Ce	49.1 mg/kg	Nd	19.1 mg/kg	Th	7.64 mg/kg
Dy	2.90 mg/kg	Sc	7.81 mg/kg	Tm	0.232 mg/kg
Gd	3.25 mg/kg	Sm	3.50 mg/kg	U	1.90 mg/kg
La	24.4 mg/kg	Tb	0.503 mg/kg	Yb	1.57 mg/kg

Indicative values for: As, Au, Co, Cr, Cs, Cu, Er, Eu, Fe, Hf, Ho, Lu, Ni, Pb, Pr, Sb, Ta, W, Y and Zn

IRMM-443-1 — EUROSOIL 1 — 200 g

Parameter	Value	Parameter	Value
K_f of Atrazine (1)	7.0	1/n of 2,4-D (1)	0.9
1/n of Atrazine (1)	0.91	pH in Water (2)	6.21
K_f of 2,4-D (1)	2.5	pH in 0.01M $CaCl_2$ (2)	5.65

Non-certified indicative values

Parameter	Value	Parameter	Value
K_f of Lindane (1)	68	Organic carbon content	32.7 g/kg
1/n of Lindane (1)	0.9	Total nitrogen content	3.4 g/kg
Total carbon content	33.9 g/kg		

(1) Determination according OECD Test guideline 106

(2) Measurement based on ISO Standard 10390

IRMM-443-2 — EUROSOIL 2 — 200 g

Certified values

Parameter	Value	Parameter	Value
K_f of Atrazine (1)	2.7	K_f of Lindane (1)	48
1/n of Atrazine (1)	0.93	1/n of Lindane (1)	0.98
K_f of 2,4-D (1)	0.99	pH in Water (2)	8.1
1/n of 2,4-D (1)	0.96	pH in 0.01M $CaCl_2$ (2)	7.5

Non-certified indicative values

Parameter	Value	Parameter	Value
Total carbon content	108.1 g/kg	Total nitrogen content	2.5 g/kg
Organic carbon content	37.2 g/kg		

(1) Determination according OECD Test guideline 106

(2) Measurement based on ISO 10390

IRMM-443-3 — EUROSOIL 3 — 200 g

Certified values

Parameter	Value	Parameter	Value
K_f of Atrazine (1)	2.4	1/n of 2,4-D (1)	0.93
1/n of Atrazine (1)	0.91	pH in Water (2)	6.2
K_f of 2,4-D (1)	1.31	pH in 0.01M $CaCl_2$ (2)	5.5

Non-certified indicative values

Parameter	Value	Parameter	Value
K_f of Lindane (1)	36	Organic carbon content	30.1 g/kg
1/n of Lindane (1)	1.0	Total nitrogen content	3.1 g/kg
Total carbon content	32.5 g/kg		

(1) Determination according OECD Test guideline 106

(2) Measurement based on ISO 10390

Soil, sediment and sludge

Code	Product	Unit
IRMM-443-4	EUROSOIL 4 Certified values	200 g

Parameter	Value	Parameter	Value
K_f of Atrazine [1]	0.7	K_f of Lindane [1]	8.3
1/n of Atrazine [1]	0.87	1/n of Lindane [1]	0.96
K_f of 2,4-D[1]	0.39	pH in Water[2]	7.5
1/n of 2,4-D[1]	0.86	pH in 0.01M $CaCl_2$ [2]	6.8

Non-certified indicative values

Parameter	Value	Parameter	Value
Total carbon content	14.5 g/kg	Total nitrogen content	1.6 g/kg
Organic carbon content	13.1 g/kg		

[1] Determination according OECD Test guideline 106

[2] Measurement based on ISO 10390

Code	Product	Unit
IRMM-443-5	EUROSOIL 5 Certified values	200 g

Parameter	Value	Parameter	Value
K_f of Atrazine [1]	13	1/n of 2,4-D[1]	0.9
1/n of Atrazine [1]	0.9	pH in Water[2]	4.1
K_f of 2,4-D[1]	18	pH in 0.01M $CaCl_2$ [2]	3.1

Non-certified indicative values

Parameter	Value	Parameter	Value
K_f of Lindane [1]	99	Organic carbon content	59.6 g/kg
1/n of Lindane [1]	0.9	Total nitrogen content	2.3 g/kg
Total carbon content	64.3 g/kg		

[1] Determination according OECD Test guideline 106

[2] Measurement based on ISO 10390

Code	Product	Unit
IRMM-443-7	EUROSOIL 7 Certified values	200 g

Parameter	Value	Parameter	Value
K_f of Atrazine [1]	4.8	1/n of 2,4-D[1]	0.88
1/n of Atrazine [1]	0.92	pH in Water[2]	5.1
K_f of 2,4-D[1]	8.2	pH in 0.01M $CaCl_2$ [2]	4.3

Non-certified indicative values

Parameter	Value	Parameter	Value
K_f of Lindane [1]	58	Organic carbon content	56.2 g/kg
1/n of Lindane [1]	0.9	Total nitrogen content	4.8 g/kg
Total carbon content	58.7 g/kg		

[1] Determination according OECD Test guideline 106

[2] Measurement based on ISO 10390

Code	Product	Unit
NIST-2586	Soil containing lead from paint - Trace elements	55 g

Soil collected from urban areas where the principal source of lead is believed to be from old lead-based house paint.

Certified values

As	8.7 mg/kg	Cr	301 mg/kg
Cd	2.71 mg/kg	Pb	432 mg/kg

Indicative values for a wide range of additional elements

Code	Product	Unit
NIST-2587	Soil containing lead from paint - Trace elements	55 g

Soil collected from a suburban garden known to have been contaminated by lead-based house paint.

Certified values

As	13.7 mg/kg	Cr	92 mg/kg
Cd	1.92 mg/kg	Pb	3242 mg/kg

Indicative values for a wide range of additional elements

Code	Product	Unit
NIST-2701	Contaminated soil - Hexavalent chromium (high level)	75 g

Certified values

Hexavalent Cr	551.2 mg/kg ± 34.5 mg/kg	Fe	23.73 % ± 0.19 %
Total Cr	4.26 % ± 0.12 %	Mn	0.2137 % ± 0.0014 %

Indicative values for selected elements.

Code	Product	Unit

NIST-2709A — San Joaquin soil - Trace and constituent elements (baseline) — 50 g

Certified values

Aluminum ..... 7.37 ± 0.16 %	Iron ..... 3.36 ± 0.07 %	Sodium ..... 1.22 ± 0.03 %
Antimony ..... 1.55 ± 0.06 mg/kg	Lead ..... 17.3 ± 0.1 mg/kg	Strontium ..... 239 ± 6 mg/kg
Calcium ..... 1.91 ± 0.09 %	Magnesium ..... 1.46 ± 0.02 %	Titanium ..... 0.336 ± 0.007 %
Barium ..... 979 ± 28 mg/kg	Manganese ..... 529 ± 18 mg/kg	Vanadium ..... 110 ± 11 mg/kg
Cadmium ..... 0.371 ± 0.002	Phosphorus . 0.0688 ± 0.0013 %	Zirconium ..... 195 ± 46 mg/kg
Chromium ..... 130 ± 9 mg/kg	Potassium ..... 2.11 ± 0.06 %	
Cobalt ..... 12.8 ± 0.2 mg/kg	Silicon ..... 30.3 ± 0.4 %	

NIST-2710A — Montana I soil - Trace and constitutent elements (highly elevated) — 50 g

Certified values

Aluminum ..... 5.95 ± 0.05 %	Iron ..... 4.32 ± 0.08 %	Silicon ..... 31.1 ± 0.4 %
Antimony ..... 52.5 ± 1.6 mg/kg	Lanthanum ..... 30.6 ± 1.2 mg/kg	Sodium ..... 0.894 ± 0.019 %
Arsenic ..... 0.154 ± 0.010 %	Lead ..... 0.552 ± 0.003 %	Strontium ..... 255 ± 7 mg/kg
Barium ..... 792 ± 36 mg/kg	Magnesium ..... 0.734 ± 0.038 %	Titanium ..... 0.311 ± 0.007 %
Calcium ..... 0.964 ± 0.045 %	Manganese ..... 0.214 ± 0.006 %	Uranium ..... 9.11 ± 0.30 mg/kg
Cadmium ..... 12.3 ± 0.3 mg/kg	Mercury ..... 9.88 ± 0.21 mg/kg	Zinc ..... 0.418 ± 0.015 %
Cobalt ..... 5.99 ± 0.14 mg/kg	Phosphorus ..... 0.105 ± 0.004 %	
Copper ..... 0.342 ± 0.005 %	Potassium ..... 2.17 ± 0.13 %	

NIST-2711A — Montana II Soil - Trace and constituent elements (mod. elevated) — 50 g

This Standard Reference Material (SRM®) is intended primarily for use in the analysis of soils, sediments, or other materials of a similar matrix. One unit of NIST-2711a consists of 50 g of the dried, powdered soil.

Al ..... 6.72 ± 0.06 %	Hg ..... 7.42 ± 0.18 mg/kg	Sb ..... 23.8 ± 1.4 mg/kg
As ..... 107 ± 5 mg/kg	K ..... 2.53 ± 0.10 %	Si ..... 31.4 ± 0.7 %
Ba ..... 730 ± 15 mg/kg	Mg ..... 1.07 ± 0.06 %	Sr ..... 242 ± 10 mg/kg
Ca ..... 2.42 ± 0.06 %	Mn ..... 675 ± 18 mg/kg	Ti ..... 0.317 ± 0.008 %
Ca ..... 54.1 ± 0.5 mg/kg	Na ..... 1.20 ± 0.01 %	U ..... 3.01 ± 0.12 mg/kg
Co ..... 9.89 ± 0.18 mg/kg	Ni ..... 21.7 ± 0.7 mg/kg	V ..... 80.7 ± 5.7 mg/kg
Cr ..... 52.3 ± 2.9 mg/kg	P ..... 842 ± 11 mg/kg	Zn ..... 414 ± 11 mg/kg
Cu ..... 140 ± 2 mg/kg	Pb ..... 0.140 ± 0.001 %	
Fe ..... 2.82 ± 0.04 %	Sa ..... 5.93 ± 0.28 mg/kg	

RTC-CLNLOAM6-100G — Clean Loam Soil — 100 g

Metals analysis

Al ..... 3860 mg/kg	K ..... 5.72 mg/kg
As ..... 2.0 mg/kg	Mg ..... 28.0 mg/kg
Ba ..... 5.0 mg/kg	Mn ..... 97.3 mg/kg
Ca ..... 20.5 meq/L	Na ..... 38.7 mg/kg
Cation exchange capacity 13.9 meq/100g	Se ..... 0.40 mg/kg
Fe ..... 383 mg/kg	V ..... 1.8 mg/kg
Hg ..... 0.03 mg/kg	Zn ..... 2.13 mg/kg

Soil analysis

Carbon (total) ..... 183 µg/g	pH ..... 7.2 units
Carbonate (total as $CaCO_3$) ..... 4.6 %	Solids ..... 99.0 %
Conductivity (25°C) ..... 14.9 mmhos/cm	Sulfate (soluble in Water) ..... 100 mg/kg
Exchangeable acidity 11.3 meq/100g	Sulfur (total) ..... 0.1 %
Organic matter ..... 1.85 %	

Wet chemistry

Nitrate as N (soluble in water) ..... 30.3 mg/kg	Phosphorus (extractable) ..... 1.0 mg/kg
Nitrogen (total Kjeldahl) ..... 0.13 %	Phosphorus (total) ..... 0.02 %
Nitrogen (ammonia, KCl) ..... 0.02 mg/kg	

RTC-CLNLOAM6-250G — Clean Loam Soil 250G — 250 g

RTC-CLNSAND4-100G — Clean Sand #4 — 100 g

Metals analysis

Al ..... 1400 mg/kg	Fe ..... 257 mg/kg
Ba ..... 5.2 mg/kg	Mn ..... 40.1 mg/kg
Ca ..... 5.8 meq/L	Zn ..... 10.0 mg/kg
Cation exchange capacity 2.0 meq/100g	

Soil analysis

Carbon (total) ..... 240 µg/g	Organic matter ..... 0.21 %
Carbonate (total as $CaCO_3$) ..... 1.5 %	pH ..... 7.2 units
Conductivity (25°C) ..... 0.67 mmhos/cm	Solids ..... 99.7 %
Exchangeable acidity 9.9 meq/100g	Sulfate (soluble in Water) ..... 19 mg/kg

Wet chemistry

Phosphorus (total) ..... 0.01 %

RTC-CLNSAND4-250G — Clean Sand #4 250g — 250 g

Soil, sediment and sludge

Code	Product	Unit
RTC-CLNSOIL1-100G	Clean Loam Soil #1	100 g

Lot CF001

Metals analysis reference values

Al	1400 mg/kg	Fe	2170 mg/kg
As	0.33 mg/kg	K (soluble)	0.65 meq/L
Ba	23.1 mg/kg	Mn	90.8 mg/kg
Ca (soluble)	5.8 meq/L	Mg	0.74 meq/L
Cation Exchange Capacity	2.0 meq/100g	Na (soluble)	0.26 meq/L
Co	0.33 mg/kg	Ni	2.3 mg/kg
Cr (total)	3.3 mg/kg	Pb	4.0 mg/kg
Cu	2.0 mg/kg	Zn	10.0 mg/kg

Soil analysis reference values

Carbon (total)	5620 µg/g	Organic matter	0.48 %
Carbonate as CaCO3 (total)	2.5 %	pH	7.5
Conductivity (25°C)	0.67 mmhos/cm	Solids	99.6 %
Exchangeable acidity	9.9 meq/100g	Sulfate (soluble)	130 mg/kg

Wet chemistry reference values

Nitrate as N (soluble)	1.2 mg/kg	P, extractable (AB-DTPA)	6.7 mg/kg
Nitrogen, ammonia (KCl)	2.0 mg/kg	P (total)	0.01 %

RTC-CLNSOIL1-250G	Clean Loam Soil #1, 250g	250 g
RTC-CLNSOIL2-100G	Clean Soil #2	100 g

Lot CF002

Metals analysis reference values

Al	3540 mg/kg	Mn	97.3 mg/kg
As	2.0 mg/kg	Mg	228 meq/L
Ba	50.0 mg/kg	Na (soluble)	38.7 meq/L
Ca (soluble)	20.5 meq/L	Ni	2.3 mg/kg
Cation Exchange Capacity	13.9 meq/100g	Se	0.40 mg/kg
Fe	3160 mg/kg	V	16.0 mg/kg
Hg	0.03 mg/kg	Zn	21.3 mg/kg
K (soluble)	5.72 meq/L		

Soil analysis reference values

Carbon (total)	1770 µg/g	pH	8.4
Carbonate as CaCO3 (total)	4.6 %	Solids	86.0 %
Conductivity (25°C)	14.9 mmhos/cm	Sulfate (soluble)	16700 mg/kg
Exchangeable acidity	11.3 meq/100g	Sulfur (total)	12.7 mg/kg
Organic matter	1.85 %		

Wet chemistry reference values

Nitrate as N (soluble)	34.3 mg/kg	P, extractable (AB-DTPA)	1.0 mg/kg
Nitrogen, ammonia (KCl)	4.7 mg/kg	P (total)	0.02 %
Nitrogen (total Kjeldahl)	0.13 %		

RTC-CLNSOIL2-250G	Clean Soil #2, 250g	250 g

Code	Product	Unit
RTC-CLNSOIL3-100G	Clean Soil #3	100 g

Lot CF003

Metals analysis reference values

Al	11000 mg/kg	Hg	0.31 mg/kg
As	2.0 mg/kg	K (soluble)	0.92 meq/L
Ba	204 mg/kg	Mn	577 mg/kg
Be	0.70 mg/kg	Mg	3.04 meq/L
Ca (soluble)	11.0 meq/L	Na (soluble)	0.48 meq/L
Cd	0.53 mg/kg	Ni	8.0 mg/kg
Co	9.3 mg/kg	Pb	17.3 mg/kg
Cr (total)	9.0 mg/kg	Se	0.30 mg/kg
Cu	9.7 mg/kg	V	17.4 mg/kg
Cation Exchange Capacity	14.7 meq/100g	Zn	112 mg/kg
Fe	27000 mg/kg		

Soil analysis reference values

Carbon (total)	45100 µg/g	pH	5.8
Carbonate as CaCO3 (total)	0.04 %	Solids	96.4 %
Conductivity (25°C)	1.27 mmhos/cm	Sulfate (soluble)	527 mg/kg
Exchangeable acidity	19.1 meq/100g	Sulfur (total)	0.02 %
Organic matter	5.96 %		

Wet chemistry reference values

Nitrate as N (soluble)	0.57 mg/kg	P, extractable (AB-DTPA)	14.3 mg/kg
Nitrogen, ammonia (KCl)	5.17 mg/kg	P (total)	0.09 %
Nitrogen (total Kjeldahl)	0.19 %		

RTC-CLNSOIL3-250G	Clean Soil #3, 250g	250 g
RTC-CLNSOIL5-100G	Clean Clay #5	100 g

Lot 014530

Metals analysis reference values

Al	4400 mg/kg	Fe	1280 mg/kg
Ba	5.2 mg/kg	K (soluble)	0.92 meq/L
Ca (soluble)	5.8 meq/L	Mn	40 mg/kg
Cation Exchange Capacity	2.0 meq/100g	Zn	10.0 mg/kg

Soil analysis reference values

Carbon (total)	20 µg/g	Organic matter	0.1 %
Carbonate as CaCO3 (total)	3.5 %	pH	7.2
Conductivity (25°C)	0.67 mmhos/cm	Solids	99.7 %
Exchangeable acidity	9.9 meq/100g	Sulfate (soluble)	19 mg/kg

Wet chemistry reference values

P (total)	0.01 %

RTC-CLNSOIL5-250G	Clean Clay Soil #5, 250g	250 g
RTC-CRM004-100G	Trace Metals - Diatomaceous Earth	100 g

Lot AY04

Certified values

Ba	1590 ± 40.6 mg/kg	Cr (total)	21.4 ± 2.98 mg/kg
Cd	2.40 ± 0.372 mg/kg	Pb	11900 ± 406mg/kg

Informational values

Ag	1 mg/kg	Mg	17100 mg/kg
Al	28900 mg/kg	Mn	91 mg/kg
As	<0.1 mg/kg	Mo	4mg/kg
B	1160 mg/kg	Na	4160 mg/kg
Ba	5 mg/kg	Ni	138 mg/kg
Be	<0.1 mg/kg	P	<10 mg/kg
Ca	28100 mg/kg	Se	2050 mg/kg
Cd	4 mg/kg	Sn	586 mg/kg
Co	138 mg/kg	Sr	82 mg/kg
Cu	19 mg/kg	Tl	30 mg/kg
Fe	<500 mg/kg	V	20 mg/kg
Hg	3 mg/kg	Zn	8470 mg/kg
K	<500 mg/kg	pH	3.46 units

Soil, sediment and sludge

Code	Product	Unit
RTC-CRM005-50G	Trace Metals - Sewage Amended Soil	50 g

Lot 019718

Aluminum, Al	12,900 ± 1480 mg/Kg	Mercury, Hg	3.22 ± 0.134 mg/Kg
Antimony, Sb	64.3 ± 7.59 mg/Kg	Molybdenum, Mo	33.5 ± 1.17 mg/Kg
Arsenic, As	38.6 ± 1.30 mg/Kg	Nickel, Ni	52.5 ± 1.44 mg/Kg
Barium, Ba	826 ± 19.5 mg/Kg	Potassium, K	6,440 ± 176 mg/Kg
Beryllium, Be	43.3 ± 1.02 mg/Kg	Selenium, Se	28.4 ± 1.81 mg/Kg
Boron, B	97.8 ± 2.97 mg/Kg	Silicon, Si	539 ± 215 mg/Kg
Cadmium, Cd	45.9 ± 1.03 mg/Kg	Silver, Ag	30.6 ± 1.02 mg/Kg
Calcium, Ca	23,000 ± 520 mg/Kg	Sodium, Na	2,500 ± 62.7 mg/Kg
Chromium, Cr (total)	59.9 ± 1.87 mg/Kg	Strontium, Sr	129 ± 5.31 mg/Kg
Cobalt, Co	44.8 ± 1.22 mg/Kg	Thallium, Tl	42.1 ± 1.38 mg/Kg
Copper, Cu	368 ± 7.16 mg/Kg	Tin, Sn	105 ± 4.02 mg/Kg
Iron, Fe	14,800 ± 357 mg/Kg	Titanium, Ti	38.0 ± 5.54 mg/Kg
Lead, Pb	87.9 ± 2.13 mg/Kg	Vanadium, V	128 ± 3.40 mg/Kg
Lithium, Li	101 ± 6.43 mg/Kg	Zinc, Zn	584 ± 13.7 mg/Kg
Magnesium, Mg	6,630 ± 176 mg/Kg	pH	6.86 ± 0.207
Manganese, Mn	192 ± 8.15 mg/Kg	Phosphorus, P	3,330 ± 151 mg/Kg

RTC-CRM020-50G	Trace Metals - Sandy Loam 2		50 g

Lot D020

Certified values

Ag	38.5 ± 0.526 mg/kg	Hg	1.12 ± 0.0279 mg/kg
Al	1760 ± 86.4 mg/kg	Mg	2690 ± 28.2 mg/kg
As	400 ± 4.33 mg/kg	Mn	945 ± 7.43 mg/kg
Ba	24.8 ± 1.02 mg/kg	Ni	16.9 ± 0.402 mg/kg
Ca	25600 ± 846 mg/kg	Pb	5110 ± 50.8 mg/kg
Cd	15.4 ± 0.248 mg/kg	Se	6.57 ± 0.446 mg/kg
Co	4.51 ± 0.220 mg/kg	Tl	5.91 ± 0.301 mg/kg
Cu	729 ± 5.57 mg/kg	V	6.47 ± 0.427 mg/kg
Fe	192000 ± 4870 mg/kg	Zn	3010 ± 22.3 mg/kg

Informational values

K	857 mg/kg	Sr	24.7 mg/kg
Na	79.2 mg/kg	pH	2.96 units

RTC-CRM021-100G	Trace Metals - Sandy Loam 3		100 g

Lot E021

Certified values

Ag	6.50 ± 0.403 mg/kg	Fe	6480 ± 484 mg/kg
Al	2730 ± 184 mg/kg	Hg	4.70 ± 0.179 mg/kg
As	24.8 ± 2.46 mg/kg	K	1010 ± 39.3 mg/kg
Ba	586 ± 8.70 mg/kg	Mn	174 ± 6.02 mg/kg
Ca	5430 ± 154 mg/kg	Na	380 ± 27.2 mg/kg
Cd	1.20 ± 0.0893 mg/kg	Ni	12.6 ± 0.893 mg/kg
Cr (total)	10.7 ± 1.03 mg/kg	Zn	546 ± 16.8 mg/kg
Cu	4790 ± 216 mg/kg		

Informational values

Co	2.7 mg/kg	Sn	304 mg/kg
Pb	145000 mg/kg	Tl	0.6 mg/kg
Mg	2370 mg/kg	V	8.7 mg/kg

RTC-CRM022-20G	Trace Metals/Cyanide - Loam 5		20 g

Lot D522

Certified values

Al	10060± 334 mg/kg	K	3170 ± 106 mg/kg
As	5.40 ± 0.308 mg/kg	Mg	9524 ± 176 mg/kg
Ba	109 ± 1.51 mg/kg	Mn	318 ± 7.31 mg/kg
Be	0.500 ± 0.0140 mg/kg	Na	268 ± 7.83 mg/kg
Ca	27242 ± 541 mg/kg	Ni	15.8 ± 0.224 mg/kg
Cd	3.10 ± 0.0560 mg/kg	Pb	415 ± 77.2 mg/kg
Co	5.70 ± 0.0980 mg/kg	V	23.2 ± 0.700 mg/kg
Cr (total)	18.8 ± 0.546 mg/kg	Zn	45.7 ± 1.12 mg/kg
Cu	12.4 ± 0.252 mg/kg	Total cyanide	26.6 ± 0.630 mg/kg
Fe	13555 ± 362 mg/kg		

Code	Product	Unit

RTC-CRM023-50G — Trace Metals - Sandy Loam 7 — 50 g

Lot DG023

Certified values

Al	8470 ± 917 mg/kg	K	2230 ± 262 mg/kg
As	380 ± 6.70 mg/kg	Mg	3060 ± 156 mg/kg
Ba	75.5 ± 4.06 mg/kg	Mn	206 ± 7.38 mg/kg
Be	0.430 ± 0.0406 mg/kg	Na	296 ± 25.0 mg/kg
Ca	5420 ± 240 mg/kg	Ni	11.0 ± 0.565 mg/kg
Cd	0.920 ± 0.308 mg/kg	Pb	213 ± 6.97 mg/kg
Co	4.68 ± 0.206 mg/kg	Se	105 ± 3.04 mg/kg
Cr (total)	31.0 ± 2.23 mg/kg	Sr	32.6 ± 106 mg/kg
Cu	8.90 ± 0.521 mg/kg	Tl	111 ± 4.13 mg/kg
Fe	10700 ± 592 mg/kg	V	21.7 ± 2.18 mg/kg
Hg	77.8 ± 5.18 mg/kg	Zn	93.8 ± 4.77 mg/kg

Informational values

B	11.0 mg/kg	Si	353 mg/kg

RTC-CRM024-50G — Trace Metals - Loamy Sand 1 — 50 g

Lot II024

Certified values

Ag	13.3 ± 0.718 mg/kg	Hg	0.710 ± 0.0341 mg/kg
Al	8680 ± 981 mg/kg	K	2102 ± 162 mg/kg
As	3.42 ± 0.353 mg/kg	Mg	2945 ± 128 mg/kg
B	7.22 ± 0.783 mg/kg	Mn	199 ± 5.45 mg/kg
Ba	79.6 ± 2.80 mg/kg	Mo	0.580 ± 0.0805 mg/kg
Be	0.430 ± 0.0495 mg/kg	Na	287 ± 17.4 mg/kg
Ca	5530 ± 175 mg/kg	Ni	15.0 ± 1.65 mg/kg
Cd	2.15 ± 0.167 mg/kg	Pb	15.7 ± 1.43 mg/kg
Cr (total)	25.4 ± 3.25 mg/kg	Sr	35.4 ± 0.777 mg/kg
Cu	8.70 ± 0.409 mg/kg	V	20.8 ± 2.18 mg/kg
Fe	10196 ± 624 mg/kg	Zn	37.3 ± 1.92 mg/kg

Informational values

Sb	1.17 mg/kg	Si	404 mg/kg
Se	0.54 mg/kg	Tl	13.6 units

RTC-CRM025-50G — Trace Metals - Sandy Loam 8 — 50 g

Lot JG025

Certified values

Ag	132 ± 28.0 mg/kg	Hg	99.8 ± 10.7 mg/kg
Al	7640 ± 541 mg/kg	K	1990 ± 150 mg/kg
As	339 ± 17.3 mg/kg	Mg	4380 ± 172 mg/kg
Ba	1840 ± 375 mg/kg	Mn	173 ± 5.08 mg/kg
Be	0.330 ± 0.00 mg/kg	Na	313 ± 16.9 mg/kg
Ca	28300 ± 1536 mg/kg	Ni	12.2 ± 1.20 mg/kg
Cd	369 ± 15.7 mg/kg	Pb	1450 ± 68.7 mg/kg
Cr (total)	441 ± 17.0 mg/kg	Se	518 ± 25.0 mg/kg
Cu	7.76 ± 0.569 mg/kg	V	19.3 ± 1.52 mg/kg
Fe	9440 ± 416 mg/kg	Zn	51.8 ± 2.81 mg/kg

Informational values

Sb	<3.2 mg/kg	Sr	408 mg/kg
B	17.2 mg/kg	Tl	<4.8 mg/kg
Mo	<0.8 mg/kg		

RTC-CRM026-50G — Trace Metals - Sandy Loam 9 — 50 g

This soil is from a slightly contaminated site located in the Western United States. The following certified values were determined by USEPA SW846 (3rd edition) Methods 3050 and 6010, except for arsenic (7060A), mercury (7471) and selenium (7740). The sample is suitable for other 3000-series metals digestion procedures and 7000-series spectroscopic methods.

Certified values

Lot LRAA1192

Ag	57.2 mg/kg	Fe	5190 mg/kg	Sb	47.6 mg/kg
Al	6680 mg/kg	Hg	11.9 mg/kg	Se	93.9 mg/kg
As	175 mg/kg	K	5680 mg/kg	Sn	95.9 mg/kg
Ba	421 mg/kg	Li	81.6 mg/kg	Sr	203 mg/kg
Be	83.1 mg/kg	Mg	6260 mg/kg	Ti	41.3 mg/kg
Ca	4630 mg/kg	Mn	173 mg/kg	Tl	147 mg/kg
Cd	298 mg/kg	Mo	33.8 mg/kg	V	146 mg/kg
Cr (total)	219 mg/kg	Ni	70.6 mg/kg	Zn	641 mg/kg
Co	98.4 mg/kg	Pb	187 mg/kg	pH	7.96 units
Cu	204 mg/kg	S	322 mg/kg		

Code	Product	Unit
RTC-CRM027-50G	Trace Metals - Sandy Loam 10	50 g

This soil is from a moderately contaminated site located in the Western United States. The Reference Values were determined by USEPA SW846 (3rd edition) Methods 3050B and 6010, except for mercury (Method 7471) and pH (method 9045).The sample is suitable for other 3000-series metals digestion procedures and 7000-series spectroscopic methods.

Certified values

Lot HC027

Ag 5.98 mg/kg	Co 4.70 mg/kg	Ni 10.5 mg/kg
Al 8537 mg/kg	Cu 9.87 mg/kg	Pb 51.9 mg/kg
As 12.4 mg/kg	Fe 11173 mg/kg	Sb 3.28 mg/kg
Ba 166 mg/kg	Hg 3.80 mg/kg	Se 14.0 mg/kg
Be 2.73 mg/kg	K 2115 mg/kg	Sr 43.0 mg/kg
Ca 5970 mg/kg	Mg 2755 mg/kg	V 21.4 mg/kg
Cd 12.0 mg/kg	Mn 259 mg/kg	Zn 51.3 mg/kg
Cr 26.9 mg/kg	Na 241 mg/kg	

Indicative values for B, Mo, Si ,Tl

Code	Product	Unit
RTC-CRM028-50G	Trace Metals - Sandy Loam 11	50 g

This soil is from a moderately contaminated site location in the Western United States.The Reference Values were determined by USEPA SW846 (3rd edition) Methods 3050 and 6010, except for mercury (Method 7471) and pH (method 9045). The sample is suitable for other 3000-series metals digestion procedures and 7000-series spectroscopic methods.

Certified values

Lot IH028

Al 7562 mg/kg	Cr 19.0 mg/kg	Mn 209 mg/kg
As 3.83 mg/kg	Co 4.3 mg/kg	Na 231 mg/kg
Ba 73.2 mg/kg	Cu 8.51 mg/kg	Ni 11.0 mg/kg
Be 0.38 mg/kg	Fe 10000 mg/kg	Pb 10.4 mg/kg
Ca 5883 mg/kg	K 2045 mg/kg	V 19.2 mg/kg
Cd 0.50 mg/kg	Mg 2995 mg/kg	Zn 75.0 mg/kg

Indicative values for B, Si, Sr

Code	Product	Unit
RTC-CRM030-50G	Trace Metals - Sandy Loam 2	50 g

This soil is from a moderately contaminated site location in the Western United States. The Reference Values were determined by USEPA SW846 (3rd edition) Methods 3050/3051 and 6010/6020, except for arsenic (7060A), mercury (7471A) and selenium (7740. The sample is suitable for other 3000-series metals digestion procedures and 7000-series spectroscopic methods.

Certified values

Lot JC030

Al 4810 mg/kg	Cu 5.68 mg/kg	Na 997 mg/kg
As 13.1 mg/kg	Fe 8320 mg/kg	Ni 6.63 mg/kg
Ba 56.1 mg/kg	Hg 6.13 mg/kg	Pb 7.13 mg/kg
Be 5.97 mg/kg	K 1480 mg/kg	Se 18.5 mg/kg
Ca 14200 mg/kg	Mg 2470 mg/kg	V 29.0 mg/kg
Cd 58.4 mg/kg	Mn 127 mg/kg	Zn 74.8 mg/kg
Cr (total) 43.8 mg/kg	Mo 8.78 mg/kg	

Informational values

Ag 0.04 mg/kg	F 29.4 mg/kg	Sr 54.4 mg/kg
B 5.29 mg/kg	Sb 2.32 mg/kg	pH 6.54 units
Cyanide 10.4 mg/kg	Si 169 mg/kg	

Code	Product	Unit
RTC-CRM033-50G	Trace Metals - Loamy Sand 10	50 g

This soil is from a moderately contaminated site location in the Western United States. The Reference Values were determined by USEPA SW846 (3rd edition) Methods 3050/3051 and 6010/6020, except for arsenic (7060A), mercury (7471A) and selenium (7740. The sample is suitable for other 3000-series metals digestion procedures and 7000-series spectroscopic methods.

Certified values

Lot 019390

Ag 73.5 mg/kg	Fe 5280 mg/kg	Pb 108 mg/kg
Al 8180 mg/kg	Hg 25.1 mg/kg	S 347 mg/kg
As 132 mg/kg	K 2660 mg/kg	Sb 49.3 mg/kg
B 120 mg/kg	Li 136 mg/kg	Se 80.5 mg/kg
Ba 132 mg/kg	Mg 2000 mg/kg	Si 860 mg/kg
Be 96.0 mg/kg	Mn 130 mg/kg	Sr 240 mg/kg
Ca 3210 mg/kg	Mo 46.1 mg/kg	V 148 mg/kg
Cd 122 mg/kg	Na 919 mg/kg	Zn 203 mg/kg
Cr (total) 63.2 mg/kg	Ni 284 mg/kg	pH 6.02 units
Cu 212 mg/kg	P 277 mg/kg	

Code	Product	Unit

RTC-CRM034-50G Trace Metals - Loamy Sand 3 — 50 g

The values were determined by USEPASW846 (3rd edition) Methods 3050/3051, 6010/6020 except for arsenic (7060A), mercury (7471A) and selenium (7740). The sample is suitable for these and other similar methods.

Certified values

Lot 010579

Ag ..... 78.8 mg/kg	Cr ..... 227 mg/kg	Ni ..... 73.7 mg/kg
Al ..... 13600 mg/kg	Cu ..... 94.7 mg/kg	Pb ..... 103 mg/kg
As ..... 82.3 mg/kg	Fe ..... 6160 mg/kg	Se ..... 92.4 mg/kg
B ..... 87.7 mg/kg	Hg ..... 24.2 mg/kg	Sr ..... 76.0 mg/kg
Ba ..... 375 mg/kg	K ..... 3720 mg/kg	Tl ..... 74.4 mg/kg
Be ..... 47.7 mg/kg	Mg ..... 4240 mg/kg	V ..... 92.2 mg/kg
Ca ..... 5820 mg/kg	Mn ..... 269 mg/kg	Zn ..... 334 mg/kg
Cd ..... 142 mg/kg	Mo ..... 15.5 mg/kg	
Co ..... 37.7 mg/kg	Na ..... 6330 mg/kg	

RTC-CRM041-30G Soil - Hexavalent Chromium VI — 30 g

Lot 015905

Certified value

Chromium VI, Cr(VI) ..... 91.4 ± 5.11 mg/kg

RTC-CRM042-50G Trace Metals - Loam 3 — 50 g

This soil is from a moderately contaminated site location in the Western United States. The Reference Values were determined by USEPA SW846 (3rd edition) Methods 3050/3051 and 6010/6020, except for arsenic (7060A), mercury (7471A) and selenium (7740. The sample is suitable for other 3000-series metals digestion procedures and 7000-series spectroscopic methods.

Certified values

Lot 013023

Ag ..... 21.5 mg/kg	Cu ..... 79.1 mg/kg	P ..... 214 mg/kg
Al ..... 7150 mg/kg	Fe ..... 15200 mg/kg	Pb ..... 133 mg/kg
As ..... 129 mg/kg	Hg ..... 24.0 mg/kg	Sb ..... 43.9 mg/kg
B ..... 79.2 mg/kg	K ..... 3900 mg/kg	Se ..... 38.8 mg/kg
Ba ..... 129 mg/kg	Li ..... 176 mg/kg	Si ..... 975 mg/kg
Be ..... 40.1 mg/kg	Mg ..... 2930 mg/kg	Sr ..... 333 mg/kg
Ca ..... 14200 mg/kg	Mn ..... 175 mg/kg	Tl ..... 42.4 mg/kg
Cd ..... 210 mg/kg	Mo ..... 76.3 mg/kg	V ..... 65.3 mg/kg
Co ..... 67.4 mg/kg	Na ..... 2030 mg/kg	Zn ..... 717 mg/kg
Cr (total) ..... 55.0 mg/kg	Ni ..... 126 mg/kg	pH ..... 6.07 units

RTC-CRM044-50G Trace Metals - Silt Loam 1 — 50 g

The values were determined by using USEPA SW846 Method 7060A for arsenic, by using USEPA SW846 Method 7471B for mercury, and by using Aqua Regia Method for cadmium, chromium, copper, lead, nickel, and zinc.

Certified values

Lot CF044

Ag ..... 114 mg/kg	Cu ..... 64.0 mg/kg	Sb ..... 106 mg/kg
Al ..... 3540 mg/kg	Fe ..... 3180 mg/kg	Se ..... 81.1 mg/kg
As ..... 52.3 mg/kg	Hg ..... 9.70 mg/kg	Si ..... 991 mg/kg
B ..... 113 mg/kg	K ..... 1480 mg/kg	Sn ..... 93.5 mg/kg
Ba ..... 145 mg/kg	Mg ..... 8920 mg/kg	Sr ..... 4520 mg/kg
Be ..... 37.3 mg/kg	Mn ..... 204 mg/kg	Ti ..... 138 mg/kg
Ca ..... 206000 mg/kg	Mo ..... 14.5 mg/kg	Tl ..... 65.3 mg/kg
Cd ..... 71.6 mg/kg	Na ..... 651 mg/kg	V ..... 82.1 mg/kg
Co ..... 50.6 mg/kg	Ni ..... 87.1 mg/kg	Zn ..... 136 mg/kg
Cr ..... 88.5 mg/kg	Pb ..... 77.8 mg/kg	pH 6.82

RTC-CRM045-50G Trace Metals - Silty Clay 1 — 50 g

The values were determined by using USEPA SW846 Method 7060A for arsenic, by using USEPA SW846 Method 7471B for Mercury, and by using Aqua Regia Method for cadmium, chromium, copper, lead, nickel, and zinc.

Certified values

Lot CF045

As ..... 18.4 mg/kg	Cr ..... 85.3 mg/kg	Pb ..... 42.8 mg/kg
Cd ..... 1.61 mg/kg	Hg ..... 0.795 mg/kg	Zn ..... 330 mg/kg
Co ..... 13.5 mg/kg	Mn ..... 292 mg/kg	
Cu ..... 122 mg/kg	Ni ..... 199 mg/kg	

Code	Product	Unit

RTC-CRM046-50G — Trace Metals - Clay 1 — 50 g

The values were determined by using USEPA SW846 Method 7060A for arsenic, by using USEPA SW846 Method 7471B for Mercury, and by using Aqua Regia Method for cadmium, chromium, copper, lead, nickel, and zinc.

Certified values

Lot CF046

As 7.47 mg/kg	Cu 62.2 mg/kg	Ni 37.5 mg/kg
Cd 7.01 mg/kg	Pb 45.3 mg/kg	Zn 114 mg/kg
Cr 45,7 mg/kg	Mn 118 mg/kg	
Co 8.22 mg/kg	Hg 0.153 mg/kg	

RTC-CRM048-50G — Trace Metals - Sand 1 — 50 g

The Reference Values were determined by USEPA SW846 (3rd edition) Methods 3050/3051 and 6010/6020, except for Arsenic (7060A), Mercury (7471A), Selenium (7740). The sample is suitable for other 3000-series metals digestion procedures and 7000-series spectroscopic methods.

Certified values

Lot 017065

Ag 75.5 mg/kg	Cu 277 mg/kg	Sb 139 mg/kg
Al 12900 mg/kg	Fe 12300 mg/kg	Se 177 mg/kg
As 123 mg/kg	Hg 28.0 mg/kg	Sn 93.5 mg/kg
B 135 mg/kg	K 11300 mg/kg	Sr 213 mg/kg
Ba 235 mg/kg	Mg 7050 mg/kg	Ti 178 mg/kg
Be 76.8 mg/kg	Mn 1160 mg/kg	Tl 60.5 mg/kg
Ca 6430 mg/kg	Mo 138 mg/kg	V 101 mg/kg
Cd 140 mg/kg	Na 8270 mg/kg	Zn 724 mg/kg
Co 177 mg/kg	Ni 100 mg/kg	Phosphorus, P 298 mg/kg
Cr 239 mg/kg	Pb 86.9 mg/kg	pH 6.82

RTC-CRM049-50G — Sandy clay - Trace Metals — 50 g

The Reference Values were determined by USEPA SW846 (3rd edition) Methods 3050/3051 and 6010/6020, except for Arsenic (7060A), Mercury (7471A), Selenium (7740). The sample is suitable for other 3000-series metals digestion procedures and 7000-series spectroscopic methods.

Certified values

Lot 019005

Ag 47.0 mg/kg	Fe 6,600 mg/kg	Se 203 mg/kg
Al 10,100 mg/kg	Hg 17.8 mg/kg	Sn 96.4 mg/kg
As 136 mg/kg	K 6,480 mg/kg	Sr 258 mg/kg
B 89.9 mg/kg	Mg 2,610 mg/kg	Ti 66.7 mg/kg
Ba 549 mg/kg	Mn 1,110 mg/kg	Tl 44.7 mg/kg
Be 251 mg/kg	Mo 51.5 mg/kg	V 148 mg/kg
Ca 4580 mg/kg	Na 1,500 mg/kg	Zn 433 mg/kg
Cd 87.9 mg/kg	Ni 288 mg/kg	Phosphorus, P 444 mg/kg
Co 218 mg/kg	Pb 340 mg/kg	Silica as SiO2 1,580 mg/kg
Cr (total) 135 mg/kg	S 368 mg/kg	pH 5.27
Cu 134 mg/kg	Sb 51.4 mg/kg	

RTC-CRM051-50G — Trace Metals - Clay 2 — 50 g

The values were determined by USEPA SW846 (3rd edition) Methods 3050B/3051, 6010B, 6020, and 7000 series. The sample is suitable for these and other similar methods.

Certified values

Lot 16485

Al 12600 mg/kg	Fe 6490 mg/kg	Si 453 mg/kg
Ag 29.1 mg/kg	Hg 4.08 mg/kg	Sn 218 mg/kg
As 79.4 mg/kg	K 7790 mg/kg	Sr 283 mg/kg
B 157 mg/kg	Mg 1440 mg/kg	Ti 177 mg/kg
Ba 391 mg/kg	Mn 408 mg/kg	Tl 192 mg/kg
Be 304 mg/kg	Mo 156 mg/kg	V 213 mg/kg
Ca 8320 mg/kg	Na 857 mg/kg	Zn 256 mg/kg
Cd 48.3 mg/kg	Ni 76 mg/kg	pH 4.34
Co 59.2 mg/kg	Pb 181 mg/kg	Phosphorus, P 414 mg/kg
Cr 171 mg/kg	Sb 105 mg/kg	Sulfur, S 471 mg/kg
Cu 327 mg/kg	Se 76.9 mg/kg	

Code	Product	Unit

RTC-CRM052-50G Trace Metals - Loamy Clay 1 — 50 g

The values were determined by Dutch standard methods (NEN 56..; 57..; 64..; and 66..; series) after total digestion using predominantly nitric/hydrochloric acid mixture (Aqua Regia) in pressurised microwave digester units. The sample is suitable for use by these, or other similar digestion and analytical procedures.

Certified values

Lot 015055

Ag	23.0 mg/kg	Mn	217 mg/kg
Al	9660 mg/kg	Mo	34.3 mg/kg
As	33.4 mg/kg	Ni	50.8 mg/kg
Ba	239 mg/kg	Pb	82.9 mg/kg
Be	46.0 mg/kg	Sb	37.9 mg/kg
B	90.5 mg/kg	Se	25.3 mg/kg
Cd	43.0 mg/kg	Si	667 mg/kg
Ca	2860 mg/kg	Na	319 mg/kg
Co	44.1 mg/kg	Sr	148 mg/kg
Cr	57.8 mg/kg	Sn	77.5 mg/kg
Cu	56.5 mg/kg	Tl	113 mg/kg
Fe	14700 mg/kg	Ti	43.2 mg/kg
Hg	2.40 mg/kg	V	107 mg/kg
K	2390 mg/kg	Zn	94.3 mg/kg
Li	101 mg/kg	pH	7.02
Mg	1690 mg/kg		

RTC-CRM059-50G Trace Metals - Loamy Clay 2 — 50 g

Certified values

Lot 010755

Antimony, Sb	86.0 mg/kg	Molybdenum, Mo	9.30 mg/kg
Arsenic, As	153 mg/kg	Nickel, Ni	75.5 mg/kg
Barium, Ba	138 mg/kg	Potassium, K	3720 mg/kg
Beryllium, Be	39.1 mg/kg	Selenium, Se	106 mg/kg
Boron, B	155 mg/kg	Silver, Ag	98.5 mg/kg
Cadmium, Cd	65.0 mg/kg	Sodium, Na	5710 mg/kg
Calcium, Ca	11700 mg/kg	Strontium, Sr	43.8 mg/kg
Chromium, Cr (total)	136 mg/kg	Thallium, Tl	81.1 mg/kg
Cobalt, Co	44.3 mg/kg	Tin, Sn	81.9 mg/kg
Copper, Cu	99.4 mg/kg	Titanium, Ti	14.3 mg/kg
Iron, Fe	21100 mg/kg	Vanadium, V	95.1 mg/kg
Lead, Pb	107 mg/kg	Zinc, Zn	428 mg/kg
Magnesium, Mg	1580 mg/kg	pH	6.83
Manganese, Mn	220 mg/kg	Aluminum, Al	7790 mg/kg
Mercury, Hg	9.72 mg/kg	Silicon, Si	508 mg/kg

RTC-CRM060-30G Chromium VI - Clay — 30 g

Chromium VI, Cr(VI) 176 ± 12.9 mg/kg

RTC-CRM061-30G Chromium VI - Sandy Loam — 30 g

Chromium VI, Cr(VI) 241 ± 9.00 mg/kg

RTC-CRM090-100G Nutrients - Clay Soil — 100 g

Lot 014687

Certified values

Ammonia as N	743 ± 35.2 mg/kg
Kjeldahl nitrogen, total (TKN)	2530 ± 104 mg/kg
Phosphorus, total	809 ± 79.5 mg/kg
Total organic carbon (TOC)	5280 ± 592 mg/kg

RTC-CRM091-100G Nutrients - Sandy Loam — 100 g

Lot 014104

Certified values

Ammonia as N	250 ± 21.6 mg/kg
Chemical oxygen demand (COD)	9160 ± 5420 mg/kg
Kjeldahl nitrogen, total (TKN)	1540 ± 119 mg/kg
Phosphorus, total	356 ± 49.5 mg/kg
Total organic carbon (TOC)	4130 ± 546 mg/kg

RTC-CRM092-100G Nutrients - Sand — 100 g

Lot 015409

Certified values

Ammonia as N	850 ± 44.2 mg/kg
Chemical oxygen demand (COD)	11800 ± 2820 mg/kg
Kjeldahl nitrogen, total (TKN)	2610 ± 121 mg/kg
Phosphorus, total	1030 ± 187 mg/kg
Loss on Ignition (550ºC)	6.51 ± 0.189 wt%
Total organic carbon (TOC)	5720 ± 651 mg/kg

Code	Product	Unit

RTC-CRM107-100G BNAs/Pesticides/Expl - Sandy Loam 9 — 100 g

PAH contaminated soil from a superfund site in the Western United States. The BNA values in the sample were certified by USEPA SW846, 3rd edition Extraction Methods 3540A/3541 (Soxhlet), 3550 (sonication), and analysis method 8270A (Semivolatile organics by GC/MS). The Organochlorine Pesticides and PCB values were certified using the same extraction methods and analysis method 8081 (pesticides by GC). The sample is suitable for these and other similar methods.

Certified values

Lot KG107

Acenaphthene	61.9 mg/kg	2,4-Dinitrotoluene	43.1 mg/kg
Bis(2-ethylhexyl)phthalate	38.5 mg/kg	Fluoranthene	19.2 mg/kg
2-Chlorophenol	37.5 mg/kg	Fluorene	30.8 mg/kg
2,4-D Acid	22.9 mg/kg	Hexachlorobenzene	42.9 mg/kg
4,4-DDD	11.1 mg/kg	Hexachloroethane	2.31 mg/kg
4,4-DDT	38.5 mg/kg	Lindane	34.3 mg/kg
2,4-DP	15.4 mg/kg	Naphthalene	36.8 mg/kg
Dalapon	8.09 mg/kg	2-Nitroaniline	15.1 mg/kg
Dibenzofuran	40.1 mg/kg	3-Nitroaniline	4,27 mg/kg
Dicamba	28.4 mg/kg	Nitrobenzene	35,0 mg/kg
2,4-Dichlorophenol	0.23 mg/kg	4-Nitrophenol	70.8 mg/kg
Dieldrin	10.8 mg/kg	2,4,5-T-Acid	15.0 mg/kg
2,4-Dinitrophenol	9.03 mg/kg	Pentachlorophenol	25.0 mg/kg

Indicative value for Aroclor 1248

RTC-CRM110-100G BNAs - Sandy Loam 2 — 100 g

BNA contaminated soil from a site in the Western United States. The BNA values in the sample were certified by USEPA SW846, 3rd edition Extraction Methods 3540A/3541 (Soxhlet), 3550 (sonication), and analysis method 8270B (Semivolatile organics by GC/MS). The sample is suitable for use by these and other similar methods.

Certified values

Lot LG110

Acenaphthene	55.6 mg/kg	Hexachlorobenzene	71.3 mg/kg
Bis(2-ethylhexyl)phthalate	13.1 mg/kg	Hexachloroethane	8.79 mg/kg
2-Chlorophenol	21.4 mg/kg	Naphthalene	30.3 mg/kg
Dibenzofuran	47.8 mg/kg	2-Nitroaniline	46.3 mg/kg
2,4-Dinitrophenol	9.98 mg/kg	4-Nitrophenol	26.2 mg/kg
2,4-Dinitrotoluene	44.6 mg/kg	Nitrobenzene	15.1 mg/kg
2,6-Dinitrotoluene	19.4 mg/kg	Pentachlorophenol	27.1 mg/kg
Fluoranthene	11.8 mg/kg	Phenol	13.9 mg/kg
Fluorene	14.2 mg/kg		

Indicative value for 3-Nitroaniline

RTC-CRM113-100G BNAs - Loamy Sand 1 — 100 g

BNA contaminated soil from a site in the Western region of the United States. The BNA values in the sample were certified by USEPA SW846, 3rd edition Extraction Methods 3540A/3541 (Soxhlet), 3550 (Sonication), and analysis method 8270C (Semivolatile Organics by GC/MS). The sample is suitable for use by these and other similar methods.

Certified values

Lot FI113

Bis(2-ethylhexyl)phthalate	0.97 mg/kg	Hexachlorobenzene	14.3 mg/kg
Benzo(b)fluoranthene	3.53 mg/kg	Hexachloroethane	1.65 mg/kg
Benzo(a)pyrene	3.17 mg/kg	4-Methylphenol	7.55 mg/kg
Chrysene	7.21 mg/kg	2-Nitroaniline	14.5 mg/kg
2,4-Dinitrophenol	1.64 mg/kg	3-Nitroaniline	0.98 mg/kg
2,4-Dinitrotoluene	16.0 mg/kg	Nitrobenzene	5.88 mg/kg
Fluoranthene	6.51 mg/kg	4-Nitrophenol	4.56 mg/kg
Fluorene	8.41 mg/kg	Pyrene	37.0 mg/kg

RTC-CRM114-100G BNAs - Loam 1 — 100 g

Soil contaminated with Semi-Volatile Organic compounds, from a site in the Western region of the United States. The Semi-VOA values in the sample were certified by USEPA SW846, 3rd edition Extraction Methods 3540C (Soxhlet extraction), 3550 (Sonication) and analysis method 8270C (Semivolatile organics by GC/MS). The sample is suitable for use by these and other similar methods.

Certified values

Lot II114

Benzo(a)anthracene	11.5 mg/kg	Hexachlorobenzene	77.1 mg/kg
Benzo(a)pyrene	33.8 mg/kg	Hexachloroethane	11.0 mg/kg
Benzo(ghi)perylene	6.68 mg/kg	1- and 2-Methylnaphthalene	61.3 mg/kg
2-Chlorophenol	30.7 mg/kg	3-Nitroaniline	29.2 mg/kg
2,4-Dichlorophenol	24.6 mg/kg	Nitrobenzene	29.9 mg/kg
2,4-Dinitrotoluene	30.2 mg/kg	4-Nitrophenol	45.4 mg/kg
Fluoranthene	54.4 mg/kg	Pentachlorophenol	30.9 mg/kg
Fluorene	25.4 mg/kg	Pyrene	9.2 mg/kg

Code	Product	Unit

RTC-CRM115-100G PAH - Loamy Sand 1 — 100 g

PAH contaminated soil from a site in the Western Region of the United States.

Certified values

Lot JC115

Acenaphthene	4.60 mg/kg	Fluoranthene	22.1 mg/kg
Benzo(a)anthracene	12.1 mg/kg	Fluorene	13.0 mg/kg
Benzo(b)Fluoranthene	0.930 mg/kg	Naphthalene	1.34 mg/kg
Chrysene	16.8 mg/kg	Phenanthrene	0.080 mg/kg
Dibenzofuran	10.6 mg/kg	Pyrene	7.66 mg/kg

Indicative values for Anthracene and Bis(2-ethylhexyl)phthalate

RTC-CRM122-100G BNAs - Soil 1 — 100 g

Lot 013063

1,4-Dichlorobenzene	1,040 ± 127 µg/kg	4-Chlorophenyl phenylether	1,380 ± 127 µg/kg
Hexachlorobutadiene	3,290 ± 437 µg/kg	Chrysene	7,570 ± 500 µg/kg
Naphthalene	4,780 ± 475 µg/kg	Dibenzo(a,h)anthracene	6,610 ± 610 µg/kg
Nitrobenzene	2,660 ± 321 µg/kg	Dibenzofuran	3,900 ± 258 µg/kg
1,2,4-Trichlorobenzene	2,780 ± 358 µg/kg	Di-n-butyl phthalate	7,890 ± 1240 µg/kg
Acenaphthene	425 ± 67.1 µg/kg	2,4-Dichlorophenol	2,560 ± 250 µg/kg
Acenaphthylene	329 ± 32.2 µg/kg	bis(2-Ethylhexyl) phthalate	1,590 ± 218 µg/kg
Anthracene	759 ± 120 µg/kg	Diethyl phthalate	6,090 ± 914 µg/kg
Benzo(a)anthracene	6,180 ± 500 µg/kg	Dimethyl phthalate	5,170 ± 674 µg/kg
Benzo(a)pyrene	1,890 ± 284 µg/kg	Fluoranthene	6,200 ± 475 µg/kg
Benzo(b)fluoranthene	4,160 ± 262 µg/kg	Fluorene	5,670 ± 498 µg/kg
Benzo(g,h,i)perylene	7,270 ± 682 µg/kg	Indeno(1,2,3-cd) pyrene	6,340 ± 611 µg/kg
Benzo(k)fluoranthen	6,240 ± 398 µg/kg	2-Nitrophenol	3,570 ± 613 µg/kg
Butyl benzyl phthalate	3,070 ± 363 µg/kg	n-Nitroso-di-n-propylamine	3,880 ± 682 µg/kg
4-Chloro-3-methylphenol	3,660 ± 336 µg/kg	Phenanthrene	6,720 ± 567 µg/kg
bis(2-Chloroethoxy)methane	1,240 ± 170 µg/kg	Pyrene	1,550 ± 159 µg/kg
bis(2-Chloroisopropyl) ether	1,140 ± 115 µg/kg	2,4,5-Trichlorophenol	1,080 ± 131 µg/kg
2-Chloronaphthalene	3,290 ± 316 µg/kg		

RTC-CRM123-100G BNAs - Silt Loam 1 — 100 g

BNA contaminated soil from a site in the Western United States. The certified values were determined by USEPA SW846 (3rd edition) Extraction Method 3540C (soxhlet) and 3550 (sonicaton), and Analysis Method 8270C (semivolatile organics by GC/MS).The sample is suitable for these and other similar methods.

Certified values

Lot CD123

Acenaphthene	7.52 mg/kg	Dimethylphthalate	9.56 mg/kg
Acenaphthylene	7.24 mg/kg	2,4-Dinitrotoluene	17.5 mg/kg
Anthracene	6.94 mg/kg	Di-n-oxtylphthalate	11.4 mg/kg
Benzo(a)anthracene	8.38 mg/kg	Fluoranthene	9.31 mg/kg
Benzo(a)pyrene	7.77 mg/kg	Fluorene	6.88 mg/kg
Bis(2-ethylhexyl)phthalate	8.90 mg/kg	Hexachlorobenzene	6.81 mg/kg
4-Bromophenyl-phenylether	13.0 mg/kg	Hexachlorobutadiene	5.46 mg/kg
4-Chloro-3-methylphenol	7.60 mg/kg	Hexachloroethane	10.6 mg/kg
2-Chloronaphthalene	7.42 mg/kg	Isophorone	8.07 mg/kg
2-Chlorophenol	8.45 mg/kg	2-Methylphenol (o-Cresol)	7.70 mg/kg
4-Chlorophenyl-phenylether	9.39 mg/kg	3-Methylphenol (m-Cresol)	9.80 mg/kg
Chrysene	11.3 mg/kg	4-Methylphenol (p-Cresol)	7.04 mg/kg
Dibenzofuran	8.19 mg/kg	Naphthalene	9.73 mg/kg
Di-n-butylphthalate	16.8 mg/kg	Nitrobenzene	10.6 mg/kg
1,2-Dichlorobenzene	5.15 mg/kg	2-Nitrophenol	6.30 mg/kg
1,3-Dichlorobenzene	4.25 mg/kg	Phenanthrene	7.94 mg/kg
1,4-Dichlorobenzene	3.98 mg/kg	Pyrene	6.75 mg/kg
2,4-Dichlorophenol	10.6 mg/kg	2,4,5-Trichlorophenol	5.29 mg/kg
2,4-Dimethylphenol	9.25 mg/kg		

Code	Product	Unit

RTC-CRM126-100G BNAs - Clay Loam 1 — 100 g

Certified values

Lot 010572

1,2-Dichlorobenzene	2.86 mg/kg	4-Chlorophenyl phenylether	8.33 mg/kg
1,3-Dichlorobenzene	2.57 mg/kg	Chrysene	2.37 mg/kg
Hexachlorobutadiene	1.66 mg/kg	Dibenzofuran	1.91 mg/kg
Hexachloroethane	0.450 mg/kg	Di-n-butyl phthalate	1.34 mg/kg
Naphthalene	0.610 mg/kg	2,4-Dichlorophenol	0.500 mg/kg
Nitrobenzene	6.03 mg/kg	Dimethyl phthalate	4.08 mg/kg
1,2,4-Trichlorobenzene	1.57 mg/kg	2,4-Dinitrotoluene (2,4-DNT)	0.880 mg/kg
Acenaphthene	4.25 mg/kg	Di-n-octyl phthalate	1.34 mg/kg
Anthracene	0.280 mg/kg	bis(2-Ethylhexyl) phthalate (DEHP)	4.88 mg/kg
Benzo(a)pyrene	0.630 mg/kg	Fluoranthene	0.120 mg/kg
Benzo(b)fluoranthene	0.610 mg/kg	Fluorene	1.45 mg/kg
Benzo(g,h,i)perylene	0.570 mg/kg	Hexachlorobenzene	0.620 mg/kg
Benzo(k)fluoranthene	0.720 mg/kg	Isophorone	6.12 mg/kg
Benzo(b+k)fluoranthene	1.29 mg/kg	2-Methyl-4,6-dinitrophenol	3.93 mg/kg
Benzyl alcohol	7.10 mg/kg	2-Methylphenol (o-Cresol)	2.57 mg/kg
4-Bromophenyl phenyl ether	10.6 mg/kg	3+4-Methylphenol (m+p-Cresol)	3.58 mg/kg
4-Chloro-3-methylphenol	0.650 mg/kg	4-Nitrophenol	5.83 mg/kg
4-Chloroaniline	0.580 mg/kg	Pentachlorophenol	0.380 mg/kg
2-Chloronaphthalene	3.89 mg/kg	Phenol	0.740 mg/kg
2-Chlorophenol	1.99 mg/kg	2,4,5-Trichlorophenol	2.26 mg/kg

RTC-CRM128-10G Nitroaromatics/Nitrosamin - Sandy Loam 1 — 10 g

Lot O34

Nitrobenzene	10.4 ± 0.0592 mg/kg	2-Nitrotoluene	16.1 ± 0.376 mg/kg
1,3-Dinitrobenzene (1,3-DNB)	12.4 ± 0.204 mg/kg	3-Nitrotoluene	18.4 ± 0.331 mg/kg
2,6-Dinitrotoluene (2,6-DNT)	8.82 ± 0.210 mg/kg		

RTC-CRM130-10G Nitroaromatics/Nitrosamine - Clay Loam 1 — 10 g

Lot 001963

Nitrobenzene	36.1 ± 2.97 mg/kg	2-Nitrotoluene	82.9 ± 2.13 mg/kg
2,4-Dinitrotoluene (2,4-DNT)	33.9 ± 0.741 mg/kg	3-Nitrotoluene	39.3 ± 1.04 mg/kg
2,6-Dinitrotoluene (2,6-DNT)	8.10 ± 0.173 mg/kg	4-Nitrotoluene	32.1 ± 0.876 mg/kg

RTC-CRM131-100G BNAs - Clay Loam 2 — 100 g

The values were determined by USEPA SW846 (3rd edition) Extraction Method 3540C (soxhlet) and 3550 (sonicaton), and Analysis Method 8270C (semivolatile organics by GC/MS). The sample is suitable for these and other similar methods.

Certified values

Lot 013243

1,2-Dichlorobenzene	1580 µg/kg	2,6-Dichlorophenol	959 µg/kg
1,3-Dichlorobenzene	1400 µg/kg	Diethyl phthalate	3950 µg/kg
1,4-Dichlorobenzene	502 µg/kg	Dimethyl phthalate	2970 µg/kg
Hexachloroethane	1180 µg/kg	2,4-Dichlorophenol	1550 µg/kg
Naphthalene	1200 µg/kg	2,4-Dinitrotoluene	1530 µg/kg
Nitrobenzene	1810 µg/kg	2,6-Dinitrotoluene	2340 µg/kg
Acenaphthene	260 µg/kg	Di-n-octyl phthalate	1990 µg/kg
Anthracene	389 µg/kg	Fluoranthene	3870 µg/kg
Benzo(a)anthracene	4060 µg/kg	Fluorene	5670 µg/kg
Benzo(a)pyrene	406 µg/kg	Hexachlorobenzene	1240 µg/kg
Benzo(b)fluoranthene	1560 µg/kg	Indeno(1,2,3-cd) pyrene	1840 µg/kg
Benzo(g,h,i)perylene	4720 µg/kg	2-Methyl-4,6-dinitrophenol	4250 µg/kg
Benzo(k)fluoranthene	3820 µg/kg	2-Methylnapthalene	1350 µg/kg
4-Bromophenyl phenyl ether	8732 µg/kg	2-Methylphenol (o-Cresol)	280 µg/kg
Butyl benzyl phthalate	2780 µg/kg	4-Nitrophenol	3550 µg/kg
bis(2-Chloroethoxy)methane	878 µg/kg	n-Nitroso-di-n-propylamine	2000 µg/kg
bis(2-Chlorophenyl)ether	1230 µg/kg	Pentachlorophenol	3190 µg/kg
2-Chlorophenol	3525 µg/kg	Phenanthrene	1900 µg/kg
4-Chlorophenyl phenyether	1180 µg/kg	Phenol	899 µg/kg
Chrysene	6790 µg/kg	Pyrene	1110 µg/kg
Dibenz(a,h) anthracene	4800 µg/kg	2,4,6-Trichlorophenol	5950 µg/kg
Dibenzofuran	4400 µg/kg		

RTC-CRM133-10G Nitroaromatics/Nitrosamine - Clay Loam 2 — 10 g

Assigned values

Nitrobenzene	7.46 mg/Kg	2-Nitrotoluene	19.7 mg/Kg
1,3-Dinitrobenzene (1,3-DNB)	12.3 mg/Kg	3-Nitrotoluene	6.47 mg/Kg
2,4-Dinitrotoluene (2,4-DNT)	16.0 mg/Kg	4-Nitrotoluene	10.7 mg/Kg
2,6-Dinitrotoluene (2,6-DNT)	20.2 mg/Kg	2,4,6-Trinitrotoluene (2,4,6-TNT)	13.8 mg/Kg
4-Amino-2,6-dinitrotoluene (4-am-dnt)	1.83 mg/Kg	HMX	2.00 mg/Kg

Code	Product	Unit

RTC-CRM135-100G BNAs - Silty Clay 1 — 100 g

Certified values

Lot 010382

1,2-Dichlorobenzene	673 µg/kg	2-Chlorophenol	1670 µg/kg
1,3-Dichlorobenzene	329 µg/kg	4-Chlorophenyl phenylether	7620 µg/kg
1,4-Dichlorobenzene	163 µg/kg	Dibenzofuran	5100 µg/kg
Hexachlorobutadiene	155 µg/kg	Di-n-butyl phthalate	4600 µg/kg
Hexachloroethane	156 µg/kg	2,4-Dichlorophenol	1550 µg/kg
Naphthalene	640 µg/kg	2,4-Dimethylphenol	3270 µg/kg
Nitrobenzene	4370 µg/kg	Dimethyl phthalate	3780 µg/kg
1,2,4-Trichlorobenzene	1710 µg/kg	2,4-Dinitrophenol	2220 µg/kg
Acenaphthene	1390 µg/kg	Di-n-octyl phthalate	5140 µg/kg
Acenaphthylene	1210 µg/kg	Fluoranthene	328 µg/kg
Aniline	2310 µg/kg	Fluorene	3410 µg/kg
Anthracene	848 µg/kg	Isophorone	742 µg/kg
Benzo(a)anthracene	3520 µg/kg	2-Methyl-4,6-dinitrophenol	4280 µg/kg
Benzo(a)pyrene	347 µg/kg	2-Methylphenol (o-Cresol)	3500 µg/kg
Benzoic acid	1900 µg/kg	4-Methylpheno (p-Cresol)	5900 µg/kg
Benzyl alcohol	1560 µg/kg	3+4-Methylphenol (m+p-Cresol)	6830 µg/kg
4-Bromophenyl phenyl ether	5260 µg/kg	2-Nitroaniline	5090 µg/kg
Butyl benzyl phthalate	3130 µg/kg	3-Nitroaniline	4930 µg/kg
Carbazole	5400 µg/kg	4-Nitroaniline	1730 µg/kg
4-Chloro-3-methylphenol	602 µg/kg	2-Nitrophenol	3820 µg/kg
4-Chloroaniline	749 µg/kg	4-Nitrophenol	3680 µg/kg
bis(2-Chloroethyl) ether	694 µg/kg	Pentachlorophenol	3420 µg/kg
2-Chloronaphthalene	2030 µg/kg	Phenanthrene	2010 µg/kg

RTC-CRM137-10G Nitroaromatics/Nitrosamin - Loamy Sand 1 — 10 g

Certified using USEPA SW846, 3rd edition, method 8330 or by similar HPLC methods.

Certified values

Nitrobenzene	4.88 mg/kg	RDX	1.16 mg/kg
1,3-Dinitrobenzene (1,3-DNB)	1.72 mg/kg	2-Nitrotoluene	3.65 mg/kg
42,4-Dinitrotoluene (2,4-DNT)	4.62 mg/kg	3-Nitrotoluene	3.13 mg/kg
2,6-Dinitrotoluene (2,6-DNT)	1.57 mg/kg	HMX	1.96 mg/kg
2-Amino-4,6-dinitrotoluene	6.86 mg/kg	Tetryl	1.96 mg/kg
4-Amino-2,6-dinitrotoluene	3.10 mg/kg	2,4,6-Trinitrotoluene(2,4,6-TNT)	5.02 mg/kg

RTC-CRM138-10G Nitroaromatics/Nitrosamin - Silty Loam 1 — 10 g

Certified values

Nitrobenzene	7.06 mg/Kg	2-Nitrotoluene	6.85 mg/kg
2,4-Dinitrotoluene (2,4-DNT)	5.22 mg/kg	3-Nitrotoluene	6.09 mg/kg
2,6-Dinitrotoluene (2,6-DNT)	6.78 mg/kg	4-Nitrotoluene	7.89 mg/kg

RTC-CRM140-100G BNAs/PAH - Clay 3 — 100 g

USEPA Method 8270C was the primary method for certification (GC-MS).

Lot 012878

1,2-Dichlorobenzene	2,140 µg/kg	Di-n-butyl phthalate	5,550 µg/kg
1,4-Dichlorobenzene	571 µg/kg	2,4-Dichlorophenol	1,090 µg/kg
Hexachlorobutadiene	1,620 µg/kg	2,6-Dichlorophenol	1,670 µg/kg
Naphthalene	1,080 µg/kg	bis(2-Ethylhexyl) phthalate (DEHP)	3,920 µg/kg
Nitrobenzene	5,150 µg/kg	Diethyl phthalate	6,470 µg/kg
Pyridine	520 µg/kg	2,4-Dimethylphenol	1,590 µg/kg
1,2,4-Trichlororbenzene	3,510 µg/kg	Dimethyl phthalate	6,470 µg/kg
Acenaphthene	1,700 µg/kg	Di-n-octyl phthalate	3,830 µg/kg
Acenaphthylene	1,370 µg/kg	Fluoranthene	1,910 µg/kg
Anthracene	1,550 µg/kg	Fluorene	3,270 µg/kg
Benzo(a)pyrene	2,750 µg/kg	Hexachlorocyclopentadiene	2,120 µg/kg
Benzo(b)fluoranthene	2,170 µg/kg	Indeno(1,2,3-cd) pyrene	883 µg/kg
Benzo(g,h,i)perylene	1,290 µg/kg	2-Methyl-4,6-dinitrophenol	1,520 µg/kg
Benzo(k)fluoranthene	1,550 µg/kg	2-Methylnaphthalene	3,890 µg/kg
4-Bromophenyl phenyl ether	7,780 µg/kg	2-Methylphenol (o-Cresol)	4,150 µg/kg
Butyl benzyl phthalate	1,540 µg/kg	2-Nitrophenol	1,940 µg/kg
4-Chloro-3-methylphenol	3,620 µg/kg	4-Nitrophenol	2,410 µg/kg
bis(2-Chloroethoxy) methane	6,910 µg/kg	Pentachlorophenol	2,520 µg/kg
bis(2-Chloroethyl) ether	3,860 µg/kg	Phenanthrene	5,020 µg/kg
1-Chloronaphthalene	1,530 µg/kg	Phenol	4,460 µg/kg
2-Chloronaphthalene	1,070 µg/kg	Pyrene	5,280 µg/kg
2-Chlorophenol	1,590 µg/kg	2,4,5-Trichlorophenol	2,790 µg/kg
Chrysene	1,350 µg/kg	2,4,6-Trichlorophenol	2,840 µg/kg

Code	Product	Unit

RTC-CRM141-50G — PAH - Loamy Clay 1 — 50 g

The organic sample is a soil containing extractable PAHs for analysis by 8100, 8270, 8310 or equivalent methods.

Certified values

Lot: 015161

Naphthalene	188 ± 40.3 µg/kg	Benzo(k)fluoranthene	253 ± 43.9 µg/kg
Acenaphthene	693 ± 174 µg/kg	Chrysene	316 ± 52.0 µg/kg
Acenaphthylene	176 ± 45.5 µg/kg	Dibenzo(a,h)anthracene	451 ± 70.4 µg/kg
Anthracene	393 ± 130 µg/kg	Fluoranthene	176 ± 40.3 µg/kg
Benzo(a)anthracene	409 ± 83.0 µg/kg	Fluorene	338 ± 111 µg/kg
Benzo(a)pyrene	198 ± 25.8 µg/kg	Indeno(1,2,3-cd)pyrene	394 ± 52.0 µg/kg
Benzo(b)fluoranthene	364 ± 48.6 µg/kg	Phenanthrene	719 ± 221 µg/kg
Benzo(g,h,i)perylene	618 ± 109 µg/kg	Pyrene	331 ± 62.0 µg/kg

RTC-CRM142-50G — PAHs - Silty Loam Soil — 50 g

Analytical data for certification was obtained using USEPA SW846, 3rd edition extraction methods 3540B/3541 (soxhlet) and 3550A (sonication). Analysis was carried out according to USEPA method 8310 & 8270. The standards are intended for use in analytical systems using these and related methods.

Lot 018015

Naphthalene	593 µg/kg	Benzo(k)fluoranthene	163 µg/kg
Acenaphthene	424 µg/kg	Chrysene	260 µg/kg
Acenaphthylene	526 µg/kg	Dibenzo(a,h)anthracene	227 µg/kg
Anthracene	252 µg/kg	Fluoranthene	850 µg/kg
Benzo(a)anthracene	225 µg/kg	Fluorene	339 µg/kg
Benzo(a)pyrene	186 µg/kg	Indeno(1,2,3-cd) pyrene	195 µg/kg
Benzo(b)fluoranthene	100 µg/kg	Phenanthrene	401 µg/kg
Benzo(g,h,i)perylene	372 µg/kg	Pyrene	418 µg/kg

RTC-CRM143-50G — BNAs - Sandy Loam — 50 g

The values were determined by USEPA SW846 (3rd edition) Extraction Method 3540C (soxhlet) and 3550 (sonicaton), and Analysis Method 8270C (semivolatile organics by GC/MS). The sample is suitable for these and other similar methods.

Certified values

1,2-Dichlorobenzene	3,400 µg/kg	Fluoranthene	5,400 µg/kg
1,4-Dichlorobenzene	6,500 µg/kg	Fluorene	7,520 µg/kg
Acenaphthene	2,740 µg/kg	Hexachlorobutadiene	4,080 µg/kg
Acenaphthylene	6,950 µg/kg	Hexachloroethane	6,020 µg/kg
Anthracene	7,160 µg/kg	Hexachlorocyclopentadiene	3,390 µg/kg
Benzo(a)anthracene	3,050 µg/kg	Indeno(1,2,3-cd)pyrene	1,470 µg/kg
Benzo(b)fluoranthene	5,370 µg/kg	Isophorone	3,860 µg/kg
Benzo(k)fluoranthene	3,690 µg/kg	2-Methyl-4,6-dinitrophenol	1,330 µg/kg
Benzo(g,h,i)perylene	2,250 µg/kg	2-Methylphenol(o-Cresol)	6,960 µg/kg
Benzo(a)pyrene	5,650 µg/kg	4-Methylphenol(p-Cresol)	2,990 µg/kg
bis(2-Ethylhexyl)phthalate	2,070 µg/kg	3+4-Methylphenol(m+p-Cresol)	2,920 µg/kg
Butylbenzylphthalate	6,310 µg/kg	Naphthalene	6,950 µg/kg
bis(2-Chloroethoxy)methane	3,290 µg/kg	Nitrobenzene	5,820 µg/kg
4-Chloro-3-methylphenol	6,560 µg/kg	2-Nitrophenol	7,330 µg/kg
2-Chloronapthalene	2,030 µg/kg	4-Nitrophenol	4,140 µg/kg
4-Chlorophenylphenylether	9,100 µg/kg	n-Nitrosodimethylamine	3,410 µg/kg
Dibenz(a,h)anthracene	2,110 µg/kg	n-Nitrosodiphenylamine	1,350 µg/kg
Di-n-butylphthalate	4,920 µg/kg	n-Nitrosodi-n-propylamine	6,810 µg/kg
2,4-Dichlorophenol	6,650 µg/kg	Phenanthrene	1,870 µg/kg
2,6-Dichlorophenol	3,330 µg/kg	Pentachlorophenol	3,350 µg/kg
Diethylphthalate	3,760 µg/kg	Phenol	3,510 µg/kg
2,4-Dimethylphenol	3,440 µg/kg	Pyrenel	1,540 µg/kg
Dimethylphthalate	6,480 µg/kg	1,2,4-Trichlorobenzene	2,600 µg/kg
Di-n-octyl phthalate	1,820 µg/kg	2,4,5-Trichlorophenol	5,330 µg/kg
2,4-Dinitrotoluene(2,4-DNT)	9,630 µg/kg		

RTC-CRM170-50G — Clay Soil - PAHs — 50 g

This soil contains extractable PAHs for analysis by 8100, 8270, 8310 or equivalent method and consist of 5 vials containing 10g of soil each.

Certified values

Lot 014934

Naphthalene	304 µg/kg	Benzo(b)fluoranthene	309 µg/kg	Fluorene	324 µg/kg
Acenaphthene	265 µg/kg	Benzo(g,h,i)perylene	747 µg/kg	Indeno(1,2,3-cd)pyrene	140 µg/kg
Acenaphthylene	486 µg/kg	Benzo(k)fluoranthene	385 µg/kg	Phenanthrene	225 µg/kg
Anthracene	162 µg/kg	Chrysene	216 µg/kg	Pyrene	314 µg/kg
Benzo(a)anthracene	284 µg/kg	Dibenzo(a,h)antracene	184 µg/kg		
Benzo(a)pyrene	84.4 µg/kg	Fluoranthene	464 µg/kg		

Code	Product	Unit

RTC-CRM171-100G PAH - Loamy Sand 2 — 100 g

Analytical data for certification was obtained using USEPA SW846, 3rd edition extraction methods 3540B/3541 (soxhlet) and 3550A (sonication). Analysis was carried out according to USEPA method 8310 & 8270. The standards are intended for use in analytical systems using these and related methods.

Lot 013231

Naphthalene	223 ± 36.7 µg/kg	Benzo(k)fluoranthene	214 ± 26.8 µg/kg
Acenaphthene	133 ± 28.3 µg/kg	Chrysene	181 ± 15.6 µg/kg
Acenaphthylene	112 ± 24.3 µg/kg	Dibenzo(a,h)anthracene	44.7 ± 10.1 µg/kg
Anthracene	27.8 ± 7.81 µg/kg	Fluoranthene	213 ± 24.5 µg/kg
Benzo(a)anthracene	85.7 ± 9.63 µg/kg	Fluorene	131 ± 18.9 µg/kg
Benzo(a)pyrene	11.8 ± 1.45 µg/kg	Indeno(1,2,3-cd) pyrene	228 ± 38.2 µg/kg
Benzo(b)fluoranthene	138 ± 15.2 µg/kg	Phenanthrene	387 ± 33.9 µg/kg
Benzo(g,h,i)perylene	347 ± 82.0 µg/kg	Pyrene	177 ± 19.3 µg/kg

RTC-CRM172-100G PAHs - Sandy Loam Soil — 100 g

Analytical data for certification was obtained using USEPA SW846, 3rd edition extraction methods 3540B/3541 (soxhlet) and 3550A (sonication). Analysis was carried out according to USEPA method 8310 & 8270. The standards are intended for use in analytical systems using these and related methods.

Lot 013043

Naphthalene	140 µg/kg	Benzo(k)fluoranthene	62.6 µg/kg
Acenaphthene	94.9 µg/kg	Chrysene	154 µg/kg
Acenaphthylene	55.6 µg/kg	Dibenzo(a,h)anthracene	284 µg/kg
Anthracene	17.7 µg/kg	Fluoranthene	634 µg/kg
Benzo(a)anthracene	303 µg/kg	Fluorene	66.4 µg/kg
Benzo(a)pyrene	33.9 µg/kg	Indeno(1,2,3-cd) pyrene	179 µg/kg
Benzo(b)fluoranthene	177 µg/kg	Phenanthrene	168 µg/kg
Benzo(g,h,i)perylene	452 µg/kg	Pyrene	86.5 µg/kg

RTC-CRM2003-50G Trace Metals - Taiwan Clay 1 — 50 g

The certified values were determined by using USEPA SW846 Method 7060A for Arsenic, by using USEPA SW846 Method 7471B for Mercury, and by using Aqua Regia Method for Cadmium, Chromium, Copper, Lead, Nickel, and Zinc.

Certified values

Lot A-21

Arsenic, As	20.7 mg/kg	Lead, Pb	44.1 mg/kg
Cadmium, Cd	1.66 mg/kg	Manganese, Mn	292 mg/kg
Chromium, Cr (total)	86.8 mg/kg	Mercury, Hg	0.865 mg/kg
Cobalt, Co	13.5 mg/kg	Nickel, Ni	206 mg/kg
Copper, Cu	126 mg/kg	Zinc, Zn	342 mg/kg

RTC-CRM2004-50G Trace Metals - Taiwan Clay 2 — 50 g

The certified values were determined by using USEPA SW846 Method 7060A for Arsenic, by using USEPA SW846 Method 7471B for Mercury, and by using Aqua Regia Method for Cadmium, Chromium, Copper, Lead, Nickel, and Zinc.

Certified values

Lot B-22

Arsenic, As	7.81 mg/kg	Lead, Pb	44.9 mg/kg
Cadmium, Cd	7.89 mg/kg	Manganese, Mn	118 mg/kg
Chromium, Cr (total)	47.1 mg/kg	Mercury, Hg	0.140 mg/kg
Cobalt, Co	8.22 mg/kg	Nickel, Ni	38.5 mg/kg
Copper, Cu	65.1 mg/kg	Zinc, Zn	118 mg/kg

RTC-CRM202-225G TCLP Metals - Sandy Loam 1 — 225 g

Collected from sites located in the Western United States and analysed for eight Toxicity Characteristic Leaching Procedure (TCLP) Metals. The samples were certified using method USEPA SW 846, 3rd edition, 1311, 6011 and 7000 series.

Certified values in the Method 1311 extract

Lot 000109

Ag	4.33 mg/L	Cd	21.4 mg/L	Pb	38.2 mg/L
As	1.70 mg/L	Cr	3.64 mg/L	Se	1.96 mg/L
Ba	4.51 mg/L	Hg	2.13 mg/L	Zn	0.449 mg/L

RTC-CRM204-225G TCLP Metals - Sandy Loam 2 — 225 g

Collected from sites located in the Western United States and analysed for eight Toxicity Characteristic Leaching Procedure (TCLP) Metals. The samples were certified using method USEPA SW 846, 3rd edition, 1311, 6011 and 7000 series.

Certified values

Lot 000107

As	0.5 mg/L	Cr	3.31 mg/L
Cd	14.8 mg/L	Pb	4.51 mg/L

Indicative values for Ag, Ba, Hg, Se

Code	Product	Unit

RTC-CRM206-225G TCLP Metals - Sandy Loam 3 — 225 g

Collected from sites located in the Western United States and analysed for eight Toxicity Characteristic Leaching Procedure (TCLP) Metals. The samples were certified using method USEPA SW 846, 3rd edition, 1311, 6011 and 7000 series.

Certified values

Lot 000117

Ag	0.605 mg/L	Cd	8.20 mg/L	Pb	1.78 mg/L
As	11.7 mg/L	Cr	0.0747 mg/L	Se	20.3 mg/L
Ba	0.247 mg/L	Hg	1.17 mg/L		

RTC-CRM207-225G TCLP Metals - Loamy Sand 3 — 225 g

Collected from sites located in the Western United States and analysed for eight Toxicity Characteristic Leaching Procedure (TCLP) Metals. The samples were certified using method USEPA SW 846, 3rd edition, 1311, 6011 and 7000 series.

Certified values

Lot 000165

Ag	0.965 mg/L	Cd	7.30 mg/L	Pb	2.54 mg/L
As	8.61 mg/L	Cr	0.762 mg/L	Se	21.1 mg/L
Ba	0.426 mg/L	Hg	0.0304 mg/L		

RTC-CRM209-225G TCLP Metals - Sandy Loam 11 — 225 g

Collected from sites located in the Western United States and analysed for six Toxicity Characteristic Leaching Procedure (TCLP) Metals. The samples were certified using method USEPA SW 846, 3rd edition, 1311, 6011 and 7000 series.

Certified values

Lot 000153

As	12.3 mg/L	Cd	4.75 mg/L	Pb	31.3 mg/L
Ba	0.265 mg/L	Cr	0.243 mg/L		

RTC-CRM210-225G TCLP Metals - Sandy Loam 12 — 225 g

Collected from sites located in the Western United States and analysed for eight Toxicity Characteristic Leaching Procedure (TCLP) Metals. The samples were certified using method USEPA SW 846, 3rd edition, 1311, 6011 and 7000 series.

Certified values

Lot 000442

Ag	0.12 mg/L	Cd	6.50 mg/L	Pb	133 mg/L
As	1.98 mg/L	Cr	0.46 mg/L	Se	1.38 mg/L
Ba	0.50 mg/L	Hg	0.45 mg/L		

RTC-CRM211-225G TCLP Metals - Sandy Loam 13 — 225 g

Collected from sites located in the Western United States and analysed for eight Toxicity Characteristic Leaching Procedure (TCLP) Metals. The samples were certified using method USEPA SW 846, 3rd edition, 1311, 6011 and 7000 series.

Certified values

Lot 000534

As	4.49 mg/L	Cr	0.533 mg/L	Zn	1.43 mg/L
Ba	0.320 mg/L	Pb	0.867 mg/L		
Cd	3.18 mg/L	Se	1.68 mg/L		

RTC-CRM212-225G TCLP Metals - Loamy Sand 1 — 225 g

Collected from sites located in the Western United States and analysed for eight Toxicity Characteristic Leaching Procedure (TCLP) Metals. The samples were certified using method USEPA SW 846, 3rd edition, 1311, 6011 and 7000 series.

Certified values

Lot 000609

As	0.295 mg/L	Cd	0.377 mg/L	Se	0.310 mg/L
Ba	0.716 mg/L	Cr	0.0187 mg/L		

Indicative values for Cu, Ag, Hg, Zn

RTC-CRM213-225G TCLP Metals - Loamy Sand 2 — 225 g

Collected from sites located in the Western United States and analysed for eight Toxicity Characteristic Leaching Procedure (TCLP) Metals. The samples were certified using method USEPA SW 846, 3rd edition, 1311, 6011 and 7000 series.

Certified values

Lot 000718

As	3.12 mg/L	Cd	13.1 mg/L	Hg	1.36 mg/L
Ag	0.0335 mg/L	Cr	0.280 mg/L	Se	7.56 mg/L
Ba	2.12 mg/L	Pb	4.83 mg/L		

Code	Product	Unit

RTC-CRM215-225G TCLP Metals - Sandy Loam 6 — 225 g

Collected from sites located in the Western United States and analysed for eight Toxicity Characteristic Leaching Procedure (TCLP) Metals. The samples were certified using method USEPA SW 846, 3rd edition, 1311, 6011 and 7000 series.

Certified values

Lot 000962

	Extraction fluid 1	Extraction fluid 2
As	3.3 mg/L	5.76 mg/L
Ba	16.5mg/L	17.4 mg/L
Cd	31.4 mg/L	54.1 mg/L
Cr	0.912 mg/L	2.09 mg/L
Pb	0.565 mg/L	1.93 mg/L
Hg	1.48 mg/L	1.78 mg/L
Se	1.31 mg/L	1.87 mg/L
Ag	ND	ND

ND: not detected

RTC-CRM217-225G TCLP Metals - Sandy Loam 8 — 225 g

Collected from sites located in the Western United States and analysed for eight Toxicity Characteristic Leaching Procedure (TCLP) Metals. The samples were certified using method USEPA SW 846, 3rd edition, 1311, 6011 and 7000 series.

Certified values

Lot BC217

As	1.84 mg/L	Cr	0.467 mg/L	Se	8.63 mg/L
Ba	3.43 mg/L	Pb	1.75 mg/L	Ag	0.037 mg/L
Cd	8.85 mg/L	Hg	0.198 mg/L		

RTC-CRM218-225G TCLP Metals - Loam 1 — 225 g

Collected from sites located in the Western United States and analysed for eight Toxicity Characteristic Leaching Procedure (TCLP) Metals. The samples were certified using method USEPA SW 846, 3rd edition, 1311, 6011 and 7000 series. All values are expressed in mg/L in the Method 1311 extract.

Certified values

Lot 017197

As	5.04 mg/L	Cu	0.0572 mg/L	Se	40.6 mg/L
Ag	0.0377 mg/L	Hg	1.03 mg/L	V	0.794 mg/L
Ba	49.4 mg/L	Pb	6.73 mg/L	Zn	41.3 mg/L
Cd	48.6 mg/L	Ni	0.0213 mg/L		
Cr	0.243 mg/L	Sb	0.0154 mg/L		

RTC-CRM304-30G BTEX - Clay 1 — 30 g

This soil is typical of that found in the backfill surrounding a leaking underground diesel storage tank (LUST). The sample has been analyzed by a minimum of 20 laboratories to meet the requirements specified by the IPA/AALA RM-03, ISO Guides 34 and 35. The soil was certified by USEPA SW846, 3rd edition Method 5030A and 8020A or 8040B and is suitable for use by these and other similar methods.

Certified values

Lot 002520

Benzene	3.57 mg/kg	o-Xylene	2.40 mg/kg
Ethylbenzene	8.73 mg/kg	Xylene, total	7.02 mg/kg
Toluene	3.84 mg/kg	Gasoline range organics (C6-C12)	65.5 mg/kg
m+p-Xylene	2.43 mg/kg		

RTC-CRM305-30G BTEX - Silt Loam 1 — 30 g

The sample was certified by USEPA SW846, 3rd edition Method 5030A and 8020A or 8240B and is suitable for use by these and other similar methods.

Certified values

Lot 010406

Benzene	57.5 mg/kg	m+p-Xylene	42.7 mg/kg
Ethylbenzene	3.49 mg/kg	o-Xylene	23.2 mg/kg
Methyl tert-butyl ether (MTBE)	31.6 mg/kg	Xylene, total	66.7 mg/kg
Toluene	15.5 mg/kg	Gasoline range organics (C6-C12)	235 mg/kg

RTC-CRM306-30G BTEX - Soil 3 — 30 g

This soil is typical of that found in the backfill surrounding a leaking underground diesel storage tank (LUST). The soil was certified by USEPA SW846, 3rd edition Method 5030A and 8021B or 8260B and is suitable for use by these and other similar methods.

Certified values

Lot 010590

Benzene	20.2 mg/kg	o-Xylene	33.6 mg/kg
Ethylbenzene	40.1 mg/kg	m+p Xylene	30.4 mg/kg
Methyl tert-butyl ether (MTBE)	9.45 mg/kg	Total Xylene	69.5 mg/kg
Toluene	51.4 mg/kg		

Soil, sediment and sludge

Code	Product	Unit
RTC-CRM307-30G	BTEX/GRO - Loamy Clay 1	30 g

This soil is typical of that found in the backfill surrounding a leaking underground diesel storage tank (LUST). The soil was certified by USEPA SW846, 3rd edition Method 5030A and 8021B or 8260B and is suitable for use by these and other similar methods. The value for GRO was determined by GC method 8015M.

Certified values

Lot 015190

Benzene	4240 µg/kg	1,3,5 – Trimethylbenzene	1750 µg/kg
Ethylbenzene	6540 µg/kg	m+p-Xylene	6300 µg/kg
MTBE	5430 µg/kg	o-Xylene	3190 µg/kg
Napthalene	3560 µg/kg	Total Xylene	9820 µg/kg
Toluene	2790 µg/kg	Total purgeable hydrocarbons	65500 µg/kg
1,2,4 –Trimethylbenzene	2190 µg/kg		

RTC-CRM308-30G	BTEX - Loamy Sand 1		30 g

Certified values

Lot 014714

Benzene	4150 µg/kg	Toluene	4940 µg/kg
1,2- Dichlorobenzene	6400 µg/kg	1,2,4-Trimethylbenzene	5100 µg/kg
1,3-Dichlorobenzene	1500 µg/kg	1,3,5-Trimethylbenzene	2690 µg/kg
1,4-Dichlorobenzene	5670 µg/kg	m+p-Xylene	5170 µg/kg
Ethylbenzene	1550 µg/kg	o-Xylene	2320 µg/kg
Methyl tert-butyl ether (MTBE)	4720 µg/kg	Xylene, total	7390 µg/kg
Napthalene	3200 µg/kg	Total purgeable Hydrocarbons	67300 µg/kg

RTC-CRM309-30G	BTEX - Clay 2		30 g

Certified values

Lot 013253

Benzene	2300 µg/kg	m+p-Xylene	7240 µg/kg
Ethylbenzene	6130 µg/kg	o-Xylene	6440 µg/kg
Methyl tert-butyl ether (MTBE)	5070 µg/kg	Xylenes, total	12100 µg/kg
Toluene	5190 µg/kg		

RTC-CRM350-100G	TPH - Sandy Clay Loam 1	100 g

This soil is typical of that found in the backfill surrounding a leaking underground diesel storage tank (LUST). The soil was certified by USEPA 418.1.

Certified value

Lot 013246

TPH 8300 mg/kg

RTC-CRM352-100G	TPH - Loamy Sand 1	100 g

Lot 019605

non-Polar Extractable Material 2,050 ± 531 mg/kg

(TPH)

RTC-CRM353-100G	TPH - Sandy Loam 3	100 g

This soil is typical of that found in the backfill surrounding a leaking underground diesel storage tank (LUST). The soil was certified by USEPA 418.1.

Certified value

Lot 012182

TPH 2200 mg/kg

RTC-CRM355-100G	TPH - Sandy Loam 1	100 g

This soil is typical of that found in the backfill surrounding a leaking underground diesel storage tank (LUST). The soil was certified by USEPA 418.1.

Certified value

Lot JC355

TPH 7040 mg/kg

RTC-CRM357-100G	TPH - Sandy Loam 2	100 g

This soil is typical of that found in the backfill surrounding a leaking underground diesel storage tank (LUST). The soil was certified by USEPA 418.1.

Certified value

Lot JF357

TPH 3220 mg/kg

RTC-CRM358-100G	TPH - Loamy Sand 3	100 g

The value was determined by USEPA Method 8015M, 418.1, Total Recoverable Petroleum Hydrocarbons.

Certified value

TPH 3650 mg/kg

Code	Product	Unit

RTC-CRM359-100G TPH - Clay Loam 1 — 100 g

Certified value

Lot 015649

Diesel range organics, C10-C28 ..... 982 mg/kg
Diesel Range Organics (DRO) ..... 1030 mg/kg
Total EPH ..... 1110 mg/kg

RTC-CRM360-100G TPH - Sandy Loam 4 — 100 g

Lot 014472

RRO (Residual Range Organics, C25-C36) ..... 610 ± 145 mg/kg

RTC-CRM371-100G Loamy Soil - TPH Banded — 100 g

The soil is to be extracted and analyzed using an appropriate extraction and analytical method for TPH, assuming a high concentration sample.

Certified values

Lot 013042

C10 to C12 Aliphatics ..... 280 ± 14.8 mg/kg
C12 to C16 Aliphatics ..... 764 ± 42.1 mg/kg
C16 to C21 Aliphatics ..... 574 ± 30.4 mg/kg
C21 to C35 Aliphatics ..... 63.4 ± 6.89 mg/kg
C10 to C12 Aromatics ..... 60.0 ± 6.70 mg/kg
C12 to C16 Aromatics ..... 210 ± 35.9 mg/kg
C16 to C21 Aromatics ..... 168 ± 12.4 mg/kg
C21 to C35 Aromatics ..... 23.6 ± 4.78 mg/kg
Total Petroleum Hydrocarbons(C6-C35) (TPH) ..... 1,570 ± 286 mg/kg

RTC-CRM372-100G TPH - Sand 1 — 100 g

Certified values

Lot 014092

Total Petroleum Hydrocarbon ..... 2020 mg/kg
C10 to C12 Aliphatics ..... 70.9 mg/kg
C12 to C16 Aliphatics ..... 314 mg/kg
C16 to C21 Aliphatics ..... 209 mg/kg
C21 to C35 Aliphatics ..... 460 mg/kg
C10 to C12 Aromatics ..... 17.1 mg/kg
C12 to C16 Aromatics ..... 112 mg/kg
C16 to C21 Aromatics ..... 96.2 mg/kg
C21 to C35 Aromatics ..... 39.4 mg/kg

RTC-CRM373-100G Clay Soil - TPH Banded — 100 g

The soil is to be extracted and analyzed using an appropriate extraction and analytical method for TPH, assuming a high concentration sample. The values given are based on GC-FID/PID and column separation methods for aliphatics and aromatics.

Certified values

Lot 014476

C10 to C12 Aliphatics ..... 93.6 ± 10.5 mg/kg
C12 to C16 Aliphatics ..... 302 ± 23.2 mg/kg
C16 to C21 Aliphatics ..... 205 ± 10.3 mg/kg
C21 to C35 Aliphatics ..... 539 ± 30.9 mg/kg
C10 to C12 Aromatics ..... 36.8 ± 8.15 mg/kg
C12 to C16 Aromatics ..... 151 ± 24.0 mg/kg
C16 to C21 Aromatics ..... 86.8 ± 11.1 mg/kg
C21 to C35 Aromatics ..... 26.7 ± 6.50 mg/kg
Total Petroleum Hydrocarbons C6-C35 . 1050 ± 101 mg/kg

RTC-CRM402-225G TCLP Semi-Volatiles - Sandy Loam 1 — 225 g

The reference values were determined by USEPA SW846 (3rd edition) Extraction Method 1311 and Analytical Methods 8081, 8150, and 8270. The sample is suitable for these and other similar methods.

Certified values

CD402

Nitrobenzene ..... 12.2 mg/L
2,4-Dinitrotoluene (2,4-DNT) ..... 0.619 mg/L
BHC (Lindane) ..... 1.28 mg/L
2,4-D ..... 67.1 mg/L

RTC-CRM497-100G pH - Sandy Clay — 100 g

Lot 014662

pH ..... 5.83 ± 0.0471

RTC-CRM498-100G pH/Conductivity - Clay Soil — 100 g

The soil is to be extracted and analyzed using an appropriate extraction and analytical method to determine pH corrosivity, such as USEPA Method SW-846 9040B or 9045C.

Lot 015914

Specific conductance conductivity (25 ºC) ..... 2100 ± 389 µmhos/cm
pH ..... 9.20 ± 0.0754

Code	Product	Unit
RTC-CRM499-100G	pH - Loamy Sand	100 g

The soil is to be extracted and analyzed using an appropriate extraction and analytical method to determine pH corrosivity such as USEPA Method SW-846 9040B or 9045C.

Lot 015063

pH ..... 9.18 ± 0.0577

Code	Product	Unit
RTC-CRM501-30G	BTEX/GRO - Loamy Clay 2	30 g

The sample was certified by USEPA Method 8015B, and is suitable for use by this and other similar methods.

Certified values

Lot 010589

Benzene	10.5 mg/kg	o-Xylene	12.6 mg/kg
Ethylbenzene	9.63 mg/kg	Xylene, total	46.3 mg/kg
Toluene	42.6 mg/kg	Gasoline range organics (C6-C12)	480 mg/kg
m+p-Xylene	34.2 mg/kg		

Code	Product	Unit
RTC-CRM502-30G	BTEX/GRO - Clay 1	30 g

The sample was certified by USEPA Method 8015B, and is suitable for use by this and other similar methods.

Certified values

Lot 013606

Benzene	8.79 mg/kg	o-Xylene	8.66 mg/kg
Ethylbenzene	5.77 mg/kg	Xylene, total	33.0 mg/kg
Toluene	27.4 mg/kg	Gasoline range organics (C5-C10)	357 mg/kg
m+p-Xylene	23.4 mg/kg		

Code	Product	Unit
RTC-CRM504-30G	BTEX/GRO - Silty Clay 1	30 g

The certified values were determined by USEPA SW846 (3rd edition) Method 8015B.

Certified values

Lot 016116

GRO (Gasoline Range Organics)	886 mg/kg	o-Xylene	26.1 mg/kg
Benzene	22.5 mg/kg	Total Xylene	92.9 mg/kg
Ethylbenzene	16.5 mg/kg	Naphthalene	3.94 mg/kg
Toluene	76.9 mg/kg	GRO (C5-C10)	685 mg/kg
m+p-Xylene	70.7 mg/kg		

Code	Product	Unit
RTC-CRM513-30G	BTEX/GRO - Sandy Loam 2	30 g

Certified values

Lot 011783

Benzene	5.11 mg/kg	o-Xylene	5.70 mg/kg
Ethylbenzene	3.86 mg/kg	Xylene, total	18.7 mg/kg
Toluene	18.6 mg/kg	Gasoline range organic (GRO), C5-C10	242 mg/kg
m+p-Xylene	14.5 mg/kg		

Code	Product	Unit
RTC-CRM550-100G	Diesel - Soil 1	100 g

This soil is typical of that found in the backfill surrounding a leaking underground diesel storage tank (LUST). The soil was certified by USEPA SW846 (3rd edition) Method 8015B..

Certified value

Lot 015644

Diesel Range Organics 963mg/kg

Code	Product	Unit
RTC-CRM558-100G	Diesel - Clay Loam 1	100 g

The sample was certified by USEPA Method 8015B, and is suitable for use by this and other similar methods.

Certified values

EPH ..... 591 mg/kg
Diesel range organics (DRO) ..... 544 mg/kg

Code	Product	Unit
RTC-CRM560-100G	Diesel - Soil 4	100 g

Certified

Diesel Range Organics (DRO) ..... 485 mg/Kg

Code	Product	Unit
RTC-CRM608-25G	Sandy loam 1 - Volatile organic compounds (VOCs) Certified values Lot 016530	25 g

Acetone	8620 µg/kg	Hexachloroethane	2030 µg/kg
Benzene	7750 µg/kg	2-Hexanone	16800 µg/kg
Bromobenzene	7660 µg/kg	Isopropylbenzene	5800 µg/kg
Bromodichloromethane	2490 µg/kg	Methyl bromide (Bromomethane)	5010 µg/kg
Bromoform	8840 µg/kg	Methyl chloride (Chloromethane)	2480 µg/kg
2-Butanone (Methyl ethyl ketone, MEK)	20900 µg/kg	Methylene chloride	6220 µg/kg
Carbon tetrachloride	3050 µg/kg	4-Methyl-2-pentanone (MIBK)	5690 µg/kg
Chlorobenzene	5730 µg/kg	Methyl tert-butyl ether (MTBE)	3340 µg/kg
Chloroform	5790 µg/kg	Naphthalene	4830 µg/kg
1,2-Dibromo-3-chloropropane	5200 µg/kg	Styrene	4780 µg/kg
1,2-Dibromoethane (Ethylenesibromide)	7190 µg/kg	1,1,2,2-Tetrachloroethane	4060 µg/kg
Dibromomethane	8620 µg/kg	Tetrachloroethylene	4460 µg/kg
1,2-Dichlorobenzene	2460 µg/kg	Toluene	8180 µg/kg
1,3-Dichlorobenzene	7150 µg/kg	1,2,4-Trichlorolbenzene	6160 µg/kg
1,4-Dichlorobenzene	5850 µg/kg	1,1,1-Trichloroethane	5830 µg/kg
1,1-Dichloroethane	2270 µg/kg	1,1,2-Trichloroethane	2050 µg/kg
1,2-Dichloroethane	8210 µg/kg	Trichlorofluoromethane	5140 µg/kg
1,1-Dichloroethylene	9860 µg/kg	1,2,3-Trichloropropane	2820µg/kg
cis-1,2-Dichloroethylene	7810 µg/kg	1,2,4-Trimethylbenzene	4670 µg/kg
1,2-Dichloropropane	8690 µg/kg	1,3,5-Trimethylbenzene	6140 µg/kg
cis-1,2-Dichloropropene	7960 µg/kg	Vinyl chloride	1560 µg/kg
trans-1,3-Dichloropropene	4300 µg/kg	m+p-Xylene	9940 µg/kg
trans-1,2-Dichloroethylene	9050 µg/kg	o-Xylene	8350 µg/kg
Ethylbenzene	7770 µg/kg	Xylene, total	18200 µg/kg

Code	Product	Unit
RTC-CRM636-25G	VOCs - Loamy Sand 5 Certified values Lot 016530	25 g

Acrolein	1080 µg/kg	Ethylbenzene	6150 µg/kg
Acetone	27900 µg/kg	2-Hexanone	11700 µg/kg
Benzene	5110 µg/kg	Isopropylbenzene	5440 µg/kg
Bromobenzene	3810 µg/kg	Methyl bromide	1980 µg/kg
Bromodichloromethane	3500 µg/kg	Methyl chloride	3620 µg/kg
2-Butanone (Methyl ethyl ketone, MEK)	15800 µg/kg	4-Methyl-2-pentanone (MIBK)	10700 µg/kg
Carbon tetrachloride	3110 µg/kg	Methyl tert-butyl ether (MTBE)	6600 µg/kg
Chlorobenzene	4740 µg/kg	Naphthalene	6780 µg/kg
Chloroethane	4010 µg/kg	Styrene	7070 µg/kg
2-Chloroethyl vinyl ether	923 µg/kg	1,1,1,2-Tetrachloroethane	5580 µg/kg
Chloroform	8260 µg/kg	1,1,2,2-Tetrachloroethane	7070 µg/kg
1,2-Dibromo-3-chloropropane	5280 µg/kg	Tetrachloroethylene	8430 µg/kg
Dibromochloromethane	8680 µg/kg	Toluene	4840 µg/kg
Dibromomethane	7950 µg/kg	1,2,4-Trimethylbenzene	8400 µg/kg
1,2-Dichlorobenzene	5330 µg/kg	1,1,2-Trichloroethane	2260 µg/kg
1,3-Dichlorobenzene	6440 µg/kg	Trichloroethene	7630 µg/kg
1,4-Dichlorobenzene	5680 µg/kg	Trichlorofluoromethane	8280 µg/kg
1,1-Dichloroethane	5770 µg/kg	1,2,3-Trichloropropane	8550µg/kg
1,2-Dichloroethane	8540 µg/kg	1,2,4-Trimethylbenzene	7650 µg/kg
1,1-Dichloroethylene	5310 µg/kg	1,3,5-Trimethylbenzene	12000 µg/kg
cis-1,2-Dichloroethylene	9050 µg/kg	Vinyl chloride	5360 µg/kg
1,2-Dichloropropane	7800 µg/kg	m+p-Xylene	8920 µg/kg
trans-1,3-Dichloropropene	6690 µg/kg	o-Xylene	2680 µg/kg
trans-1,2-Dichloroethylene	6720 µg/kg	Xylene	11300 µg/kg

Code	Product	Unit
RTC-CRM638-25G	VOCs - Clay 4 Certified values Lot 015215	25 g

Acetone	27900 µg/kg	2-Hexanone	15800 µg/kg
Benzene	5390 µg/kg	Isopropylbenzene	8520 µg/kg
Bromobenzene	3660 µg/kg	Methyl bromide	5020 µg/kg
Bromodichloromethane	3870 µg/kg	Methyl chloride	1970 µg/kg
2-Butanone (Methyl ethyl ketone, MEK)	11100 µg/kg	4-Methyl-2-pentanone (MIBK)	10600 µg/kg
Carbon tetrachloride	6910 µg/kg	Methyl tert-butyl ether (MTBE)	3060 µg/kg
Chlorobenzene	9080 µg/kg	Naphthalene	6250 µg/kg
Chloroethane	4060 µg/kg	Styrene	5650 µg/kg
Chloroform	5800 µg/kg	1,1,1,2-Tetrachloroethane	5280 µg/kg
1,2-Dibromo-3-chloropropane	5730 µg/kg	Tetrachloroethylene	7200 µg/kg
Dibromochloromethane	3320 µg/kg	Toluene	8060 µg/kg
1,2-Dibromomethane	6300 µg/kg	1,2,4-Trichlorobenzene	2960 µg/kg
Dibromomethane	6240 µg/kg	1,1,1-Trichloroethane	9380 µg/kg
1,2-Dichlorobenzene	9130 µg/kg	1,1,2-Trichloroethane	2940 µg/kg
1,3-Dichlorobenzene	3600 µg/kg	Trichloroethene	7470µg/kg
1,4-Dichlorobenzene	3320 µg/kg	Trichlorofluoromethane	8400 µg/kg
1,2-Dichloroethane	7970 µg/kg	1,2,3-Trichloropropane	3490 µg/kg
1,1-Dichloroethylene	5780 µg/kg	1,2,4-Trimethylbenzene	11400 µg/kg
cis-1,2-Dichloroethylene	5050 µg/kg	1,3,5-Trimethylbenzene	18800 µg/kg
1,2-Dichloropropane	6900 µg/kg	Vinyl chloride	8370 µg/kg
cis-1,3-Dichloropropene	6640 µg/kg	m+p-Xylene	11500 µg/kg
trans-1,2-Dichloroethylene	9380 µg/kg	o-Xylene	2790 µg/kg
Ethylbenzene	6480 µg/kg	Xylene	14500 µg/kg

RTC-CRM700-50G	Anions - Sandy Loam 1 Lot 019372	50 g

Bromide	98.2 ± 4.39 mg/Kg
Chloride	761 ± 37.7 mg/Kg
Fluoride	244 ± 15.3 mg/Kg
Nitrate as N	71.5 ± 2.75 mg/Kg
Nitrate+nitrite as N	75.1 ± 3.29 mg/Kg
Orthophosphate as P	128 ± 3.37 mg/Kg
Sulfate	163 ± 5.85 mg/Kg

RTC-CRM701-50G	Anions - Clay 1 Lot 014084	50 g

Bromide	137 ± 3.99 mg/Kg
Chloride	348 ± 16.4 mg/Kg
Fluoride	245 ± 26.2 mg/Kg
Nitrate as N	51.8 ± 1.91 mg/Kg
Nitrate+nitrite as N	51.8 ± 2.64 mg/Kg
Orthophosphate as P	73.5 ± 8.79 mg/Kg
Sulfate	374 ± 12.0 mg/Kg

RTC-CRM702-50G	Anions - Loamy Sand 1 Lot 015911	50 g

Bromide	154 ± 3.32 mg/Kg
Chloride	85.1 ± 12.4 mg/Kg
Fluoride	51.7 ± 18.4 mg/Kg
Nitrate as N	198 ± 8.25 mg/Kg
Nitrate+nitrite as N	196 ± 9.89 mg/Kg
Orthophosphate as P	46.5 ± 20.4 mg/Kg
Sulfate	2080 ± 113 mg/Kg

RTC-CRM751-30G	Cyanide - Clay Cyanide Concentration 61.4 mg/kg (values may vary by lot)	30 g
RTC-CRM752-30G	Cyanide - Sandy Loam Cyanide Concentration 83.7 mg/kg (Values may vary by lot)	30 g
RTC-CRM776-30G	Sulfide - Clay Lot 016510 Sulfide 91.7 ± 30.6 mg/Kg	30 g
RTC-CRM777-30G	Sulfide - Sandy Loam Lot 017082 Sulfide 167 ± 16.3 mg/Kg	30 g

Code	Product	Unit

RTC-CRM803-50G — Herbicides - Sandy Loam 1 — 50 g

Soil contaminated with herbicide compounds from an agricultural region in the Western region of the United States. The sample was certified by USEPA SW846, 3rd edition Methods 8151 (herbicides by GC). The sample is suitable for these and other similar methods.

Certified values

Lot GF803

2,4-D ..... 44600 µg/kg	2,4,5-T .....25746 µg/kg	2,4,5-TP ..... 41334 µg/kg

RTC-CRM804-50G — Pesticides - Sandy Loam 1 — 50 g

Soil contaminated with pesticide compounds from an agricultural region in the Western region of the United States. The sample was certified by USEPA SW846, 3rd edition Methods 3540A/3541 (Soxhlet extraction), 3550 (Sonication), and 8081 (Pesticides by GC). The sample is suitable for these and other similar methods.

Certified values

Lot DG804

Aldrin..... 18 µg/kg	4,4'-DDT.....1060 µg/kg	EndosulfanII..... 1128 µg/kg
4,4'-DDD ..... 1531 µg/kg	Dieldrin .....1863 µg/kg	Endrin ..... 62.2 µg/kg
4,4'-DDE ..... 1520 µg/kg	Endosulfan I .....1464 µg/kg	Lindane..... 491 µg/kg

RTC-CRM805-50G — Pesticides - Sandy Loam 2 — 50 g

Soil contaminated with pesticide compounds from an agricultural region in the Western region of the United States. The sample was certified by USEPA SW846, 3rd edition Methods 3540A/3541 (Soxhlet extraction), 3550 (Sonication), and 8081 (Pesticides by GC). The sample is suitable for use by these and other similar methods.

Certified values

Lot FH805

DDD ..... 19500 µg/kg	Endosulfan I .....6900 µg/kg	Endrine aldehyde ..... 95.5 µg/kg
DDE ..... 18613 µg/kg	Endosulfan II .....5940 µg/kg	Lindane..... 10618 µg/kg
DDT ..... 786 µg/kg	Endrin.....12967 µg/kg	Methoxychlor ..... 15800 µg/kg

RTC-CRM806-100G — Chlordane - Loamy Sand 1 — 100 g

The certified value was determined by USEPA SW846 (3rd edition) Extraction Methods 3540B/3541 (soxhlet), 3550A (sonication) and Analysis Method 8081 (pesticides by GC). The sample is suitable for these and other similar methods.

Certified value

Lot FH806

Chlordane ..... 7.19 mg/kg

RTC-CRM808-50G — Herbicides - Loam 1 — 50 g

Soil fortified with herbicides to meet the requirements of NELAC Fields of Testing. The sample was certified by USEPA SW846 (3rd edition) method 8151 (herbicides by GC). The sample is suitable for these and other similar methods.

Certified values

Lot AC808

2,4-D ..... 314 µg/kg	Dicamba.....307 µg/kg	2,4,5-TP..... 302 µg/kg
2,4-DB ..... 252 µg/kg	2,4,5-T acid .....222 µg/kg	

Indicative value for Pentachlorophenol

RTC-CRM810-50G — Herbicides - Loamy Sand 1 — 50 g

Soil fortified with herbicides to meet the requirements of NELAC Fields of Testing. The sample was certified by USEPA SW846 (3rd edition) method 8151A (herbicides by GC). The sample is suitable for these and other similar methods.

Certified values

Lot BC810

2,4,5-T ..... 171 µg/kg	2,4-D .....311 µg/kg	Dicamba ..... 369 µg/kg
2,4,5-TP (Silvex)..... 249 µg/kg	Dalapon.....156 µg/kg	

RTC-CRM812-50G — Chlordane - Sandy Loam 1 — 50 g

The certified value was determined by USEPA SW846 (3rd edition) Extraction Methods 3540B/3541 (soxhlet), 3550A (sonication) and Analysis Method 8081 (pesticides by GC). The sample is suitable for these and other similar methods.

Certified value

Lot AL812

Chlordane ..... 205 µg/kg

RTC-CRM813-50G — Toxaphene - Sandy Loam 1 — 50 g

The certified value was determined by USEPA SW846 (3rd edition) Extraction Methods 3540B/3541 (soxhlet), 3550A (sonication) and Analysis Method 8081 (pesticides by GC). The sample is suitable for these and other similar methods.

Certified value

Lot BC813

Toxaphene..... 254 µg/kg

Code	Product	Unit

RTC-CRM814-50G — Pesticides - Sandy Loam 3 — 50 g

The sample was certified by USEPA SW846 (3rd edition) method 8081A (Pesticides by GC). The sample is suitable for these and other similar methods.

Certified values

Lot 014692

Aldrin	80.1 µg/kg	Endrin ketone	125 µg/kg
4,4'-DDD	189 µg/kg	Heptachlor	99.4 µg/kg
4,4'-DDE	410 µg/kg	Hexachlorobenzene	255 µg/kg
4,4'-DDT	322 µg/kg	alpha-HCH	258 µg/kg
Dieldrin	182 µg/kg	beta-HCH	140 µg/kg
Endosulfan I	425 µg/kg	gamma-HCH (Lindane)	276 µg/kg
Endosulfan II	58.3 µg/kg	alpha- Chlordane	92.5 µg/kg
Endosulfan sulfate	62.0 µg/kg	gamma – Chlordane	63.9 µg/kg
Endrin	393 µg/kg	Methoxychlor	327 µg/kg
Endrin aldehyde	149 µg/kg	Propachlor	98.0 µg/kg

RTC-CRM817-50G — Herbicides - Loam 2 — 50 g

Soil fortified with herbicides to meet the requirements of NELAC Fields of Testing. The sample was certified by USEPA SW846 (3rd edition) method 8151A (herbicides by GC). The sample is suitable for these and other similar methods.

Certified values
Lot BE817

Dalapon	112 µg/kg	Dicamba	247 µg/kg	2,4,5-T acid	84.5 µg/kg
2,4-D acid	250 µg/kg	MCPP	4800 µg/kg	2,4,5-TP	188 µg/kg
2,4-DB	188 µg/kg	Pentachlorophenol	267 µg/kg		

RTC-CRM818-50G — Pesticides - Loam 1 — 50 g

Soil fortified with pesticide compounds to meet the requirements of NELAC Fields of Testing. The sample was certified by USEPA SW846 (3rd edition) method 8081A (Pesticides by GC). The sample is suitable for these and other similar methods.

Certified values

Aldrin	182 µg/kg	Endosulfan Sulfate	345 µg/kg
4,4'-DDD	553 µg/kg	Endrin	340 µg/kg
4,4'-DDE	417 µg/kg	Heptachlor	194 µg/kg
4,4'-DDT	446 µg/kg	alpha-HCH	394 µg/kg
Dieldrin	344 µg/kg	beta-HCH	333 µg/kg
Endosulfan I	318 µg/kg	gamma-HCH (Lindane)	416 µg/kg
Endosulfan II	357 µg/kg	Methoxychlor	280 µg/kg

RTC-CRM821-50G — OP Pesticides - Sandy Loam 1 — 50 g

Certified values

Lot 014702

Azinphos-methyl (Guthion)	0.792 mg/kg	Malathion	0.277 mg/kg
Chlorfenvinphos	0.186 mg/kg	Parathion, methyl	0.629 mg/kg
Chlorpyrifos	0.150 mg/kg	Parathion, ethyl	0.432 mg/kg
Diazinon	0.509 mg/kg	Phorate	0.0903 mg/kg
EPN	0.508 mg/kg	Ronnel	0.250 mg/kg
Ethoprop	0.328 mg/kg	Sulfotepp	0.026 mg/kg
Famphur	0.526 mg/kg	Tetrachlorvinphos	0.642 mg/kg
Fenthion	0.311 mg/kg	Disulfoton	0.117 mg/kg

RTC-CRM823-50G — Herbicides - Soil 2 (Please ask for details) — 50 g

Soil fortified with pesticide compounds to meet the requirements of NELAC Fields of Testing RCRA Solid. Analytical data for Certification was obtained using USEPA SW846, 3rd edition extraction methods 3540B/3541 (soxhlet) and 3550A (sonication). Analysis was carried out according to USEPA method 8270 (Semi-volatile Organics by GC/MS). The standards are intended for use in analytical systems using these and related methods.

Certified values

2,4-D	412 µg/kg	Dinoseb	474 µg/kg
2,4-D8	879 µg/kg	Pentachlorophenol	129 µg/kg
Dalapon	189 µg/kg	Silvex (2,4,5-TP)	382 µg/kg
Disulfoton	114 µg/kg	2,4,5-T	538 µg/kg

RTC-CRM824-50G — Pesticides - Sandy Loam 4 — 50 g

Soil fortified with pesticide compounds to meet the requirements of NELAC Fields of Testing. The sample was certified by USEPA SW846 (3rd edition) method 8081A (Pesticides by GC). The sample is suitable for these and other similar methods.

Certified values

Lot BL824

4,4'-DDD	367 µg/kg	Endrin aldehyde	398 µg/kg
4,4'-DDE	396 µg/kg	Heptachlor	338 µg/kg
4,4'-DDT	363 µg/kg	Heptachlor epoxide (beta)	317 µg/kg
Endosulfan I	361 µg/kg	alpha-HCH	361 µg/kg
Endosulfan II	340 µg/kg	beta-HCH	382 µg/kg
Endosulfan sulfate	327 µg/kg	gamma-HCH (Lindane)	371 µg/kg
Endrin	358 µg/kg	Methoxychlor	365 µg/kg

Indicative value for Endrin ketone

Code	Product	Unit

RTC-CRM825-50G — Chlordane - Sandy Loam 2 — 50 g

The certified value was determined by USEPA SW846 (3rd edition) Extraction Methods 3540B/3541 (soxhlet), 3550A (sonication) and Analysis Method 8081 (pesticides by GC). The sample is suitable for these and other similar methods.

Certified value

Lot BL825

Chlordane ..... 392 µg/kg

RTC-CRM826-50G — Toxaphene - Soil 2 — 50 g

The Certified value was determined by USEPA SW846 (3rd edition) Extraction Methods 3540B/3541 (soxhlet), 3550A (sonication) and Analysis Method 8081 (pesticides by GC). The sample is suitable for these and other similar methods.

Certified value

Lot BL826

Toxaphene..... 257 µg/kg

RTC-CRM828-50G — OP Pesticides - Sandy Loam 2 — 50 g

Fortified to meet the requirements of NELAC Fields of Testing, RCRA Solid. The Reference Values were determined by USEPA SW846 (3rd edition) method 8081A.

Certified values

Lot 001682

Aldrin	126 µg/Kg	Endosulfan sulfate	319 µg/Kg
4,4'-DDD	397 µg/Kg	Endrin	336 µg/Kg
4,4'-DDE	293 µg/Kg	alpha-HCH	338 µg/Kg
4,4'-DDT	302 µg/Kg	beta-HCH	272 µg/Kg
Dieldrin	225 µg/Kg	gamma-HCH (Lindane)	384 µg/Kg
Endosulfan I	170 µg/Kg	Heptachlor	136 µg/Kg
Endosulfan II	223 µg/Kg	Methoxychlor	279 µg/Kg

RTC-CRM829-50G — Toxaphene - Silt Loam 1 — 50 g

Certified value

Lot 01678

Toxaphene..... 221 µg/kg

RTC-CRM831-50G — Herbicides - Silt Loam 1 — 50 g

Fortified to meet the requirements of NELAC Fields of Testing, RCRA Solid. The Reference Values were determined by USEPA SW846 (3rd edition) Analysis Method 8151. (herbicides by GC).

Certified values

Lot 001679

Pentachlorophenol	161 µg/kg	2,4-DB	361 µg/kg	2,4,5-T	172 µg/kg
2,4-D	415 µg/kg	Dicamba	374 µg/kg		
Dalapon	158 µg/kg	Silvex (2,4,5-TP)	297 µg/kg		

RTC-CRM837-50G — OP Pesticides - Silt Loam 1 — 50 g

The reference values were determined by USEPA SW846 (3rd edition) Analysis Method 8141A.

Certified values

Lot 015621

Azinphos-methyl (Guthion)	299 µg/kg	Malathion	706 µg/kg
Chlorpyrifos	292 µg/kg	Methyl parathion (Parathion, methyl)	227 µg/kg
Diazinon	624 µg/kg	Parathion, ethyl	782 µg/kg
EPN	553 µg/kg	Ronnel	180 µg/kg
Ethoprop	300 µg/kg	Tetrachlorvinphos	254 µg/kg

RTC-CRM846-50G — Pesticides - Loamy Sand 1 — 50 g

The reference values were determined by USEPA SW846 (3rd edition) method 8081A. The sample is suitable for this and other similar methods.

Certified values

Lot 015141

Aldrin	63.8 µg/kg	Endrin ketone	82.7 µg/kg
alpha-Chlordane	98.3 µg/kg	Endrin	222 µg/kg
gamma-Chlordane	376 µg/kg	delta-HCH	100 µg/kg
4,4'-DDD	259 µg/kg	alpha-HCH	256 µg/kg
4,4'-DDE	243 µg/kg	beta-HCH	327 µg/kg
4,4'-DDT	190 µg/kg	gamma-HCH (Lindane)	147 µg/kg
Dieldrin	290 µg/kg	Heptachlor	70.8 µg/kg
Endosulfan I	187 µg/kg	Heptachlor epoxide	238 µg/kg
Endosulfan II	119 µg/kg	Methoxychlor	238 µg/kg
Endosulfan sulfate	160 µg/kg	Propachlor	287 µg/kg
Endrin aldehyde	116 µg/kg	Trifluralin	282 µg/kg

Code	Product	Unit
RTC-CRM847-50G	**Pesticides - Clay Loam 1** The certified values were determined by USEPA SW846 (3rd edition) method 8081A. The sample is suitable for this and other similar methods. Certified values Lot 002405 4,4'-DDD ..... 228 µg/kg 4,4'-DDE ..... 218 µg/kg 4,4'-DDT ..... 172 µg/kg Aldrin ..... 115 µg/kg Dieldrin ..... 125 µg/kg Endosulfan I ..... 160 µg/kg Endosulfan II ..... 233 µg/kg Endosulfan sulfate ..... 270 µg/kg Endrin ..... 377 µg/kg Endrin aldehyde ..... 49.3 µg/kg alpha-HCH ..... 225 µg/kg beta-HCH ..... 92.4 µg/kg delta-HCH ..... 67.6 µg/kg gamma-HCH (Lindane) ..... 340 µg/kg Heptachlor ..... 109 µg/kg Heptachlor epoxide (beta) ..... 98.7 µg/kg Methoxychlor ..... 172 µg/kg	50 g
RTC-CRM853-50G	**Toxaphene - Clay 1** Certified value Lot 010770 Toxaphene ..... 306 µg/kg	50 g
RTC-CRM860-50G	**Pesticides - Loamy Sand 2** Certified values Lot 010760 Hexachlorobenzene ..... 83.3 µg/kg delta-BHC ..... 65.7 µg/kg alpha-BHC (alpha-Hexachlorocyclohexane) ..... 115 µg/kg beta-BHC (beta-Hexachlorocyclohexane) ..... 109 µg/kg alpha-Chlordane ..... 74.0 µg/kg gamma-Chlordane ..... 101 µg/kg 4,4'-DDD ..... 116 µg/kg 4,4'-DDE ..... 70.8 µg/kg 4,4'-DDT ..... 49.4 µg/kg Dieldrin ..... 79.7 µg/kg Endosulfan I ..... 91.5 µg/kg Endosulfan II ..... 111 µg/kg Endosulfan sulfate ..... 58.6 µg/kg Endrin aldehyde ..... 50.2 µg/kg Endrin ketone ..... 119 µg/kg Endrin ..... 75.3 µg/kg Heptachlor ..... 68.1 µg/kg Heptachlor epoxide ..... 106 µg/kg Methoxychlor ..... 96.6 µg/kg	50 g
RTC-CRM910-50G	**PCB 1242 - Loam** Real-world waste produced from a contaminated site in the Eastern United States. The sample was certified by USEPA SW846, 3rd edition Method 3540A/8081 and is suitable for use by these and other similar methods. Certified value D910 Aroclor 1242 ..... 39.4 mg/kg	50 g
RTC-CRM911-50G	**PCB 1254 - Loam** Real-world waste collected from a percolation pond at an electric generating facility in the Southeastern United States. The sample was certified by USEPA SW846 (3rd edition) Methods 3540A/3545/3550 and 8082. The sample is suitable for use by these and other similar methods. Certified value BC911 Aroclor 1254 ..... 1.28 mg/kg	50 g
RTC-CRM913-50G	**PCB 1254 - Sandy Loam** Real-world waste collected from electric utility storage site Western United States.The PCB value was certified using extraction method 3540A and analysis method 8081 (PCBs by GC) and is suitable for use by these and other similar methods. Certified value Lot DG913 Aroclor 1254 ..... 5.93 mg/kg	50 g
RTC-CRM915-50G	**PCB 1260 - Sandy Loam** Real-world waste collected from a site in the Western United States. The sample was certified by USEPA SW846, 3rd edition Method 3540A/8081 and is suitable for use by these and other similar methods. Certified values Lot JG915 Aroclor 1260 ..... 1.50 mg/kg	50 g

Code	Product	Unit
RTC-CRM916-50G	PCB 1248 - Loamy Sand Real-world waste collected from a site in the Western United States. The sample was certified by USEPA SW846, 3rd edition Method 3540A/8081 and is suitable for use by these and other similar methods. Certified value Lot IH916 Aroclor 1248 ..... 10.7 mg/kg	50 g
RTC-CRM917-50G	PCB 1242 - Loamy Sand Real-world waste collected from a site in the Western United States. The sample was certified by USEPA SW846, 3rd edition Method 3540A/8081 and is suitable for use by these and other similar methods. Certified value Lot II917 Aroclor 1242 ..... 5.05 mg/kg	50 g
RTC-CRM918-50G	PCB 1254 - Sandy Loam Real-world waste collected from a site in the Western United States. The sample was certified by USEPA SW846, 3rd edition Method 3540A/8081 and is suitable for use by these and other similar methods. Certified value Lot JI918 Aroclor 1252 ..... 274 mg/kg	50 g
RTC-CRM919-50G	PCB 1221 - Sandy Loam Aroclor-1221 (PCB-1221)..... 22.0 ± 2.05 mg/kg	50 g
RTC-CRM921-50G	PCB 1242 - Sandy Loam Real-world waste collected from a site in the Western United States. The sample was certified by USEPA SW846, 3rd edition Method 3540A/8081 and is suitable for use by these and other similar methods. Certified value Lot AL921 Aroclor 1242 ..... 29.8 mg/kg	50 g
RTC-CRM922-50G	PCB 1016 - Loam Real-world waste collected from a site in the Western United States. The sample was certified by USEPA SW846, 3rd edition Method 3540A/8081 and is suitable for use by these and other similar methods. Certified value Aroclor 1016 ..... 8.30 mg/kg	50 g
RTC-CRM923-50G	PCB 1254 - Silt Loam Real-world waste collected from a site in the Western United States. The sample was certified by USEPA SW846, 3rd edition Method 3540A/8081 and is suitable for use by these and other similar methods. Certified value BL923 Aroclor 1254 ..... 5.47 mg/kg	50 g
RTC-CRM924-50G	PCB 1242 - Silt Loam Certified value Lot P76 Aroclor 1242 ..... 8.27 mg/kg	50 g
RTC-CRM927-50G	PCB 1242 - Clay Loam The certified value was determined by USEPA SW846 (3rd edition) Methods 8081A and 8082. The sample is suitable for use by these and other similar methods. Certified value Lot 002392 Aroclor 1242 ..... 7.03 mg/kg	50 g

Soil, sediment and sludge

Code	Product	Unit
RTC-CRM961-50G	PCB Congeners - Clay Certified values Lot 013366	50 g

PCBs, total	3,100 ± 516 µg/kg
2,4,4'-Trichlorobiphenyl (PCB 28)	135 ± 19.8 µg/kg
2,2',5,5'-Tetrachlorobiphenyl (PCB 52)	85.9 ± 18.2 µg/kg
3,3',4,4'-Tetrachlorobiphenyl (PCB 77)	223 ± 31.5 µg/kg
3,4,4',5-Tetrachlorobiphenyl (PCB 81)	205 ± 35.8 µg/kg
2,2',4,5,5'-Pentachlorobiphenyl (PCB 101)	106 ± 11.0 µg/kg
2,3,3',4,4'-Pentachlorobiphenyl (PCB 105)	147 ± 18.5 µg/kg
2,3',4,4',5-Pentachlorobiphenyl (PCB 118)	173 ± 19.9 µg/kg
2,3',4,4',5'-Pentachlorobiphenyl (PCB 123)	170 ± 24.0 µg/kg
2,3,4,4',5-Pentachlorobiphenyl (PCB 114)	183 ± 28.9 µg/kg
3,3',4,4',5-Pentachlorobiphenyl (PCB 126)	213 ± 26.6 µg/kg
2,2',3,4,4',5'-Hexachlorobiphenyl (PCB 138)	130 ± 22.8 µg/kg
2,2',4,4',5,5'-Hexachlorobiphenyl (PCB 153)	137 ± 18.5 µg/kg
2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167)	236 ± 43.7 µg/kg
3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169)	124 ± 15.5 µg/kg
2,2',3,4,4',5,5'-Heptachlorobiphenyl (PCB 180)	116 ± 11.6 µg/kg
2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189)	247 ± 60.2 µg/kg
PCB (156)+(157)	370 ± 4.59 µg/kg

Code	Product	Unit
RTC-CRM962-50G	PCB Congeners - Loamy Sand Certified values Lot 012222	50 g

2,4,4'-Trichlorobiphenyl (PCB 28)	180 ± 53.6 µg/kg
2,2',5,5'-Tetrachlorobiphenyl (PCB 52)	179 ± 40.7 µg/kg
3,3',4,4'-Tetrachlorobiphenyl (PCB 77)	221 ± 32.1 µg/kg
3,4,4',5-Tetrachlorobiphenyl (PCB 81)	165 ± 2.73 µg/kg
2,2',4,5,5'-Pentachlorobiphenyl (PCB 101)	119 ± 39.5 µg/kg
2,3,3',4,4'-Pentachlorobiphenyl (PCB 105)	108 ± 19.6 2 µg/kg
2,3',4,4',5-Pentachlorobiphenyl (PCB 118)	154 ± 11.8 2 µg/kg
2,3',4,4',5'-Pentachlorobiphenyl (PCB 123)	187 ± 28.0 µg/kg
2,3,4,4',5-Pentachlorobiphenyl (PCB 114)	128 ± 3.69 µg/kg
3,3',4,4',5-Pentachlorobiphenyl (PCB 126)	124 ± 23.3 µg/kg
2,2',3,4,4',5'-Hexachlorobiphenyl (PCB 138)	265 ± 84.9 µg/kg
2,2',4,4',5,5'-Hexachlorobiphenyl (PCB 153)	204 ± 74.9 µg/kg
2,3,3',4,4',5'-Hexachlorobiphenyl (PCB 157)	241 ± 101 µg/kg
2,3,3',4,4',5-Hexachlorobiphenyl (PCB 156)	211 ± 60.3 µg/kg
2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167)	225 ± 35.0 µg/kg
3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169)	178 ± 32.9 µg/kg
2,2',3,4,4',5,5'-Heptachlorobiphenyl (PCB 180)	287 ± 66.5 µg/kg
2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189)	204 ± 35.7 µg/kg
PCB (156)+(157)	450 ± 29.7 µg/kg

Code	Product	Unit
RTC-CRM963-50G	PCB Congeners - Silty Loam Certified values (Values may vary by lot)	50 g

2,4,4'-Trichlorobiphenyl (PCB 28)	86.3 µg/kg
2,2',5,5'-Tetrachlorobiphenyl (PCB 52)	41.2 µg/kg
2,2',4,5,5'-Pentachlorobiphenyl (PCB 101)	77.5 µg/kg
2,3',4,4',5-Pentachlorobiphenyl (PCB 118)	80.1 µg/kg
2,2',3,4,4',5'-Hexachlorobiphenyl (PCB 138)	50.3 µg/kg
2,2',4,4',5,5'-Hexachlorobiphenyl (PCB 153)	55.5 µg/kg
2,2',3,4,4',5,5'-Heptachlorobiphenyl (PCB 180)	89.2 µg/kg

Code	Product	Unit
RTC-CRM981-10G	Dioxin in Soil Certified values Lot 013623	10 g

1,2,3,4,6,7,8-HpCDF	789 ± 50.7 pg/g	1,2,3,4,6,7,8,9-OCDD	305 ± 36.9 pg/g
1,2,3,4,6,7,8-HpCDD	196 ± 12.4 pg/g	1,2,3,7,8-PeCDD	83.9 ± 8.43 pg/g
HpCDD (total)	196 ± 11.0 pg/g	PeCDD (total)	95.4 ± 2.34 pg/g
HpCDF (total)	796 ± 54.3 pg/g	2,3,7,8-TCDD	804 ± 57.6 pg/g
1,2,3,4,7,8-HxCDD	479 ± 40.5 pg/g	2,3,7,8-TCDF	306 ± 28.9 pg/g
1,2,3,6,7,8-HxCDD	87.0 ± 11.0 pg/g	TCDF (total)	323 ± 30.0 pg/g
1,2,3,7,8,9-HxCDD	908 ± 55.5 pg/g	TCDD (total)	804 ± 56.9 pg/g
HxCDD (total)	1430 ± 137 pg/g	PCDD (total)	2750 ± 136 pg/g
1,2,3,4,7,8-HxCDF	228 ± 13.0 pg/g	PCDD + PCDF (total)	4690 ± 275 pg/g
HxCDF (total)	235 ± 10.2 pg/g	PCDF (total)	1950 ± 183 pg/g
1,2,3,4,6,7,8,9-OCDF	700 ± 64.3 pg/g		

Code	Product	Unit
RTC-SQC001-50G	Metals in Soil Lot LRAA0982 Certified values	50 g

Ag	114 ± 9.31 mg/kg	Mn	204 ± 14.3 mg/kg
Al	3540 ± 379 mg/kg	Mo	14.5 ± 1.02 mg/kg
As	52.3 ± 7.17 mg/kg	Na	651 ± 77.2 mg/kg
Ba	145 ± 13.7 mg/kg	Ni	87.1 ± 4.64 mg/kg
Be	37.3 ± 2.09 mg/kg	Pb	77.8 ± 2.07 mg/kg
B	113 ± 6.73 mg/kg	Sb	103 ± 16.2 mg/kg
Cd	71.6 ± 3.05 mg/kg	Se	81.1 ± 7.07 mg/kg
Co	50.6 ± 5.62 mg/kg	Si	991 ± 157 mg/kg
Cr (total)	88.5 ± 7.04 mg/kg	Sn	94.8 ± 10.7 mg/kg
Cu	64.0 ± 2.53 mg/kg	Sr	4520 ± 326 mg/kg
Fe	3180 ± 284 mg/kg	Ti	138 ± 18.1 mg/kg
Hg	9.70 ± 0.650 mg/kg	Tl	65.3 ± 6.45 mg/kg
K	1480 ± 213 mg/kg	V	82.1 ± 6.44 mg/kg
Li	926 ± 45.3 mg/kg	Zn	136 ± 4.13 mg/kg
Mg	8920 ± 464 mg/kg	pH	8.27 ± 0.0300 units

RTC-SQC011-100G	Soil - Cyanide - QC Analyte Concentration Range: 0.0 to 100 mg/kg. Amenable Cyanide/Cyanide	100 g
RTC-SQC014-100G	Soil - Nutrients Lot 015915 Certified values	100 g

Ammonia as N	2160 mg/kg	Phosphorus, total	490 mg/kg
COD	16000 mg/kg	TOC	6510 mg/kg
Kjeldahl nitrogen, total	3270 mg/kg		

RTC-SQC016-10G	Dioxins and Furans in Soil Analyte Concentration Range: 5 to 5000 pg/g.	10 g

1,2,3,4,6,7,8-HpCDD	1,2,3,7,8,9-HxCDF
1,2,3,4,6,7,8-HpCDF	1,2,3,4,6,7,8,9-OCDD
1,2,3,4,7,8,9-HpCDF	1,2,3,4,6,7,8,9-OCDF
1,2,3,4,7,8-HxCDD	1,2,3,7,8-PeCDD
1,2,3,6,7,8-HxCDD	1,2,3,7,8-PeCDF
1,2,3,7,8,9-HxCDD	2,3,4,7,8-PeCDF
1,2,3,4,7,8-HxCDF	2,3,7,8-TCDD
1,2,3,6,7,8-HxCDF	2,3,7,8-TCDD
2,3,4,6,7,8-HxCDF	

RTC-SQC022-30G	Nitroaromatics/Nitrosamines in Soil Lot 013567 Certified values	30 g

Nitrobenzene	9,410 µg/kg
1,3-Dinitrobenzene (1,3-DNB)	8,110 µg/kg
2,4-Dinitrotoluene (2,4-DNT)	5,770 µg/kg
2,6-Dinitrotoluene (2,6-DNT)	7,350 µg/kg
Tetryl (Methyl-2,4,6-trinitrophenylnitramine)	3,120 µg/kg
1,3,5-Trinitrobenzene (1,3,5-TNB)	3,860 µg/kg
2-Amino-4,6-dinitrotoluene (2-am-dnt)	7,520 µg/kg
4-Amino-2,6-dinitrotoluene (4-am-dnt)	2,720 µg/kg
2-Nitrotoluene	3,810 µg/kg
3-Nitrotoluene	11,400 µg/kg
4-Nitrotoluene	4,140 µg/kg
Pentaerythritoltetranitrate (PETN)	1,710 µg/kg
2,4,6-Trinitrotoluene (2,4,6-TNT)	2,050 µg/kg
HMX (Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine)	3,480 µg/kg

RTC-SQC023-100G	Corrosivity/pH in soil Analyte Concentration Range: 2 to 12 pH Units (Conductivity: 100 to 10000 µmhos/cm)	100 g
RTC-SQC026-100G	TPH in Soil Analyte Concentration Range: 0 to 10,000 mg/kg	100 g

Soil, sediment and sludge

Code	Product	Unit
RTC-SQC026TXL-30G	Total Petroleum Hydrocarbons (TPH) in Soil - Low Level Lot 018064	30 g

C6 Aliphatics	16.9 ± 0.466 mg/kg
>C6 to C8 Aliphatics	18.9 ± 0.602 mg/kg
>C8 to C10 Aliphatics	7.84 ± 0.269 mg/kg
>C10 to C12 Aliphatics	8.80 ± 0.302 mg/kg
>C12 to C16 Aliphatics	7.91 ± 0.259 mg/kg
>C16 to C21 Aliphatics	6.92 ± 0.235 mg/kg
>C21 to C35 Aliphatics	32.5 ± 0.699 mg/kg
>C7-C8 Aromatics	6.42 ± 0.201 mg/kg
>C8 to C10 Aromatics	14.2 ± 0.436 mg/kg
>C10 to C12 Aromatics	11.1 ± 0.342 mg/kg
>C12 to C16 Aromatics	9.07 ± 0.279 mg/kg
>C16 to C21 Aromatics	5.87 ± 0.186 mg/kg
>C21 to C35 Aromatics	19.0 ± 0.599 mg/kg
TPH (C6-C35)	132 ± 37.6 mg/kg
Diesel-range TPH (>C12-C28)	50.8 ± 4.19 mg/kg
Gasoline Range Organics (C6-C12)	62.2 ± 11.4 mg/kg

RTC-SQC068-50G	Soil - PCB Congeners Certified values Lot 019678	50 g

PCBs, total	1,910 ± 222 µg/kg
2,4,4'-Trichlorobiphenyl (PCB 28)	263 ± 39.3 µg/kg
3,3',4,4'-Tetrachlorobiphenyl (PCB 77)	332 ± 59.9 µg/kg
3,4,4',5-Tetrachlorobiphenyl (PCB 81)	37.1 ± 12.0 µg/kg
2,2',4,5,5'-Pentachlorobiphenyl (PCB 101)	197 ± 53.7 µg/kg
2,3,3',4,4'-Pentachlorobiphenyl (PCB 105)	22.0 ± 2.24 µg/kg
2,3',4,4',5-Pentachlorobiphenyl (PCB 118)	194 ± 8.50 µg/kg
2,3,4,4',5-Pentachlorobiphenyl (PCB 114)	65.3 ± 8.06 µg/kg
3,3',4,4',5-Pentachlorobiphenyl (PCB 126)	271 ± 18.9 µg/kg
2,2',3,4,4',5'-Hexachlorobiphenyl (PCB 138)	129 ± 98.7 µg/kg
2,2',4,4',5,5'-Hexachlorobiphenyl (PCB 153)	82.4 ± 1.83 µg/kg
2,3,3',4,4',5-Hexachlorobiphenyl (PCB 156)	89.2 ± 17.9 µg/kg
2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167)	237 ± 9.40 µg/kg
3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169)	65.9 ± 6.29 µg/kg
2,2',3,4,4',5,5'-Heptachlorobiphenyl (PCB 180)	44.0 ± 3.20 µg/kg
2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189)	232 ± 7.50 µg/kg

RTC-SQC082-100G	Solids in soil Percent Dry Weight Percent Moisture Solids, Fixed Solids, Total Solids, Volatile	100 g

Sewage sludge

LGC6181	Sewage sludge - Extractable metals The extractable metal content refers to metals soluble in Aqua Regia using methods based on ISO11466 (1995). Certified values	100 g

Ag 55 mg/kg	Cr 78 mg/kg	Ni 45 mg/kg
As 7.8 mg/kg	Fe 40300 mg/kg	Pb 105 mg/kg
Cd 5.8 mg/kg	Hg 4.9 mg/kg	V 20 mg/kg
Cu 354 mg/kg	Mn 454 mg/kg	Zn 1100 mg/kg

LGC6182	Sewage sludge - PAHs A digested sewage sludge of mixed origin was taken from a city water treatment plant immediately after discharge from a digestion tank. Assessed Values	30 g

Acenaphthene	0.10 mg/kg	Chrysene	0.84 mg/kg
Anthracene	0.17 mg/kg	Fluoranthene	1.81 mg/kg
Benzo(*a*)anthracene	0.66 mg/kg	Fluorene	0.19 mg/kg
Benzo(*b*)fluoranthene	0.95 mg/kg	Indeno(1,2,3*cd*)pyrene	0.58 mg/kg
Benzo(*k*)fluoranthene	0.45 mg/kg	Naphthalene	0.33 mg/kg
Benzo(*ghi*)perylene	0.62 mg/kg	Phenanthrene	1.04 mg/kg
Benzo(a)pyrene	0.59 mg/kg	Pyrene	1.53 mg/kg

Indicative values for Acenaphthylene, Dibenzo(a,h)anthracene

Code	Product	Unit
LGC6184	**Sewage sludge - PCBs** A digested sewage sludge of mixed origin, taken from a city water treatment plant in the Czech Republic, immediately after discharge from a digestion tank. Certified values PCB 101 ..... 37 µg/kg PCB 118 ..... 17 µg/kg PCB 153 ..... 112 µg/kg Assessed values PCB 28 ..... 28 µg/kg PCB 149 ..... 63 µg/kg PCB 187 ..... 35 µg/kg PCB 52 ..... 14 µg/kg PCB 170 ..... 37 µg/kg PCB 194 ..... 13 µg/kg PCB 138 ..... 77 µg/kg PCB 180 ..... 78 µg/kg Indicative values for PCB 31, PCB 77, PCB 110	30 g
BCR-143R	**Sewage sludge amended soil - Major and trace elements** Certified values Cd ..... 71.8 mg/kg Hg ..... 1.10 mg/kg Pb ..... 179.7 mg/kg Co ..... 12.3 mg/kg Mn ..... 904 mg/kg Zn ..... 1055 mg/kg Cu ..... 130.6 mg/kg Ni ..... 299 mg/kg Aqua regia soluble content Cd ..... 72.0 mg/kg Mn ..... 858 mg/kg Pb ..... 174 mg/kg Cr ..... 426 mg/kg Ni ..... 296 mg/kg Zn ..... 1063 mg/kg	40 g
BCR-144R	**Sewage sludge (domestic origin) - Trace elements** Certified values Cd ..... 1.82 mg/kg Cu ..... 308 mg/kg Ni ..... 47.7 mg/kg Co ..... 15.0 mg/kg Hg ..... 3.14 mg/kg Pb ..... 106 mg/kg Cr ..... 104.3 mg/kg Mn ..... 207.9 mg/kg Zn ..... 932 mg/kg Aqua Regia soluble content Certified values Cd ..... 1.84 mg/kg Cu ..... 300 mg/kg Ni ..... 44.9 mg/kg Co ..... 13.3 mg/kg Hg ..... 3.11 mg/kg Pb ..... 96 mg/kg Cr ..... 90 mg/kg Mn ..... 189 mg/kg Zn ..... 919 mg/kg	40 g
BCR-145R	**Sewage sludge (mixed origin) - Trace elements** Certified values Cd ..... 3.50 mg/kg Hg ..... 2.01 mg/kg Pb ..... 286 mg/kg Co ..... 5.61 mg/kg Mn ..... 156 mg/kg Zn ..... 2122 mg/kg Cu ..... 696 mg/kg Ni ..... 247 mg/kg Indicative value for Cr Aqua Regia soluble content Certified values Cr ..... 307 mg/kg Ni ..... 251 mg/kg Zn ..... 2137 mg/kg Cu ..... 707 mg/kg Pb ..... 282 mg/kg Indicative values for Cd, Co, Hg, Mn	40 g
BCR-146R	**Sewage sludge (industrial origin) - Trace elements** Certified values Cd ..... 18.8 mg/kg Cu ..... 838 mg/kg Ni ..... 69.7 mg/kg Co ..... 7.39 mg/kg Hg ..... 8.62 mg/kg Pb ..... 609 mg/kg Cr ..... 196 mg/kg Mn ..... 324 mg/kg Zn ..... 3061 mg/kg Aqua regia soluble content Certified values Cd ..... 18.5 mg/kg Cu ..... 831 mg/kg Ni ..... 65.0 mg/kg Co ..... 6.5 mg/kg Hg ..... 8.39 mg/kg Pb ..... 583 mg/kg Cr ..... 174 mg/kg Mn ..... 298 mg/kg Zn ..... 3043 mg/kg	40 g
BCR-483	**Sewage sludge amended soil - Extractable trace elements** EDTA-extractable Certified values Cd ..... 24.3 mg/kg Cu ..... 215 mg/kg Pb ..... 229 mg/kg Cr ..... 28.6 mg/kg Ni ..... 28.7 mg/kg Zn ..... 612 mg/kg Acetic acid-extractable Certified values Cd ..... 18.3 mg/kg Cu ..... 33.5 mg/kg Pb ..... 2.10 mg/kg Cr ..... 18.7 mg/kg Ni ..... 25.8 mg/kg Zn ..... 620 mg/kg Indicative values for the calcium chloride extractable content, the sodium nitrate extractable content and the ammonium nitrate extractable content.	70 g

Soil, sediment and sludge

Code	Product	Unit
BCR-484	Sewage sludge amended (terra rossa) soil - Extractable trace elements	70 g

EDTA-extractable

Certified values

Cd ..... 0.51 mg/kg	Ni ..... 1.39 mg/kg	Zn ..... 383 mg/kg
Cu ..... 88 mg/kg	Pb ..... 59.7 mg/kg	

Acetic acid-extractable

Certified values

Cd ..... 0.48 mg/kg	Ni ..... 1.69 mg/kg	Zn ..... 193 mg/kg
Cu ..... 33.9 mg/kg	Pb ..... 1.17 mg/kg	

Indicative values for the calcium chloride extractable content, the sodium nitrate extractable content and the ammonium nitrate extractable content.

BCR-597	Sewage sludge - Chromium (+18 degrees)	40 g

Certified value

Cr ..... 203 mg/kg

BCR-677	Sewage sludge - PCDD/PCDFs	40 g

Certified values

2,3,7,8-TCDD ..... 1.51 pg/g	2,3,4,7,8-PeCDF ..... 16.9 pg/g
1,2,3,7,8-PeCDD ..... 4.1 pg/g	1,2,3,4,7,8-HxCDF ..... 14.5 pg/g
1,2,3,6,7,8-HxCDD ..... 235 pg/g	1,2,3,6,7,8-HxCDF ..... 6.1 pg/g
1,2,3,7,8,9-HxCDD ..... 79 pg/g	1,2,3,7,8,9-HCDF ..... 0.84 pg/g
1,2,3,4,6,7,8-HpCDD ..... 3.5×10^3 pg/g	2,3,4,6,7,8-HxCDF ..... 5.6 pg/g
OCDD ..... 12.7×10^3 pg/g	1,2,3,4,6,7,8-HpCDF ..... 62 pg/g
2,3,7,8-TCDF ..... 45 pg/g	1,2,3,4,7,8,9-HpCDF ..... 6.3 pg/g
1,2,3,7,8-PeCDF ..... 24.8 pg/g	OCDF ..... 177 pg/g

NIST-2781	Domestic sludge - Metals	40 g

Certified values

As ..... 7.82 mg/kg	Mo ..... 46.7 mg/kg	Se ..... 16.0 mg/kg
Cd ..... 12.78 mg/kg	N ..... 4.78 %	Zn ..... 1273 mg/kg
Cu ..... 627.4 mg/kg	Ni ..... 80.2 mg/kg	
Hg ..... 3.64 mg/kg	Pb ..... 202.1 mg/kg	

Indicative values for Ag, Al, Ca, Cr, Fe, K, Mg, Na, P, Si, Ti

NIST-2782	Industrial sludge - Leachable and total metals	70 g

Obtained from an industrial site in northern New Jersey, USA where pharmaceutical research is carried out.

Certified values

As ..... 166 mg/kg	Hg ..... 1.10 mg/kg	Se ..... 0.44 mg/kg
Cd ..... 4.17 mg/kg	Mo ..... 10.07 mg/kg	Zn ..... 1254 mg/kg
Cr ..... 109 mg/kg	Ni ..... 154.1 mg/kg	
Cu ..... 2594 mg/kg	Pb ..... 574 mg/kg	

Indicative values for a wide range of additional elements

RTC-CRM006-50G	Trace Metals - Paint Sludge 1	50 g

Lot AS06

Certified values

Al ..... 73.4 ± 4.20 mg/kg	K ..... 8710 ± 289 mg/kg
Ba ..... 9970 ± 1147 mg/kg	Mg ..... 47.0 ± 7.41 mg/kg
Ca ..... 111 ± 17.9 mg/kg	Na ..... 91.3 ± 16.0 mg/kg
Cd ..... 32.4 ± 1.05 mg/kg	Pb ..... 753 ± 22.8 mg/kg
Cr (total) ..... 11.1 ± 1.14 mg/kg	Zn ..... 737000 ± 63959 mg/kg
Fe ..... 64.4 ± 3.08 mg/kg	

RTC-CRM009-100G	Trace Metals - Electroplating Sludge 1	100 g

Lot Y009

Certified values

Cr (total) ..... 50.3 ± 4.26 mg/kg	Ni ..... 343 ± 8.12 mg/kg
Cu ..... 121000 ± 3046 mg/kg	Ag ..... 8.90 ± 1.66 mg/kg
Pb ..... 14200 ± 406 mg/kg	

Informational values

Al ..... 894 mg/kg	Mn ..... 37 mg/kg
As ..... 23 mg/kg	Mo ..... 22 mg/kg
B ..... 150 mg/kg	Na ..... 18400 mg/kg
Ba ..... 48 mg/kg	P ..... <10 mg/kg
Be ..... <1.0 mg/kg	Sb ..... 9 mg/kg
Ca ..... 1140 mg/kg	Se ..... <0-1 mg/kg
Cd ..... 1 mg/kg	Sn ..... 38500 mg/kg
Co ..... 7 mg/kg	Sr ..... 26 mg/kg
Fe ..... 3820 mg/kg	Tl ..... 26 mg/kg
Hg ..... 1 mg/kg	V ..... 1 mg/kg
K ..... 638 mg/kg	Zn ..... 43 mg/kg
Mg ..... 155 mg/kg	pH ..... 7.99 units

Code	Product	Unit

RTC-CRM010-100G Trace Metals - Electroplating Sludge 2 — 100 g

Lot RY010

Certified values

Ag	56.4 ± 2.13 mg/kg	Fe	2700 ± 274 mg/kg
Al	693 ± 27.7 mg/kg	Mn	17.5 ± 0.677 mg/kg
Ba	173 ± 8.12 mg/kg	Ni	194 ± 5.08 mg/kg
Ca	563 ± 11.2 mg/kg	Pb	119000 ± 9475 mg/kg
Cr (total)	79.5 ± 4.74 mg/kg	Zn	183 ± 13.9 mg/kg
Cu	63200 ± 812 mg/kg		

Informational values

Hg	1.4 mg/kg	Na	1580 mg/kg
Mg	80.0 mg/kg	pH	3.86 units

RTC-CRM018-50G Trace Metals - Wet Sewage Sludge — 50 g

Certified values

Ag	72.1 ± 4.23 mg/kg	K	2660 ± 249 mg/kg
Al	22400 ± 836 mg/kg	Mg	4300 ± 249 mg/kg
As	6.63 ± 1.08 mg/kg	Mn	200 ± 5.58 mg/kg
Ba	1100 ± 45.0 mg/kg	Mo	10.5 ± 1.53 mg/kg
Be	0.300 ± 0.0440 mg/kg	Na	1000 ± 86.0 mg/kg
Ca	49100 ± 1685 mg/kg	Ni	20.4 ± 1.18 mg/kg
Cd	5.57 ± 0.355 mg/kg	Pb	126 ± 3.42 mg/kg
Co	3.22 ± 0.403 mg/kg	Se	8.38 ± 1.54 mg/kg
Cu	840 ± 30.3 mg/kg	Sr	420 ± 18.1 mg/kg
Fe	9900 ± 707 mg/kg	V	39.2 ± 1.74 mg/kg
Hg	4.78 ± 0.663 mg/kg	Zn	1120 ± 50.4 mg/kg

Informational values

B	25.8 mg/kg	TOC	15.4 mg/kg
Sb	<2.0 mg/kg	Nitrogen, total Kjeldahl	2.6 wt%
Si	609 mg/kg	P (total)	2.29 wt%
Tl	<1.0 mg/kg	Solids (total)	55.3 wt%
Ammonia as N	7170 mg/kg		

RTC-CRM029-50G Trace Metals - Sewage Sludge 2 — 50 g

Digested sewage sludge from a publicly owned treatment works (POTW), representative of a residential area with light industrial influence. The certified values were determined by USEPA SW846 (3rd edition) Methods 3050B and 6010B, except for Mercury (Method 7471). The sample is suitable for other 3000-series metals digestion procedures and 7000-series spectroscopic methods.

Certified values

Lot 013583

Ag	70.4 mg/kg	K	3370 mg/kg	Tl	44.9 mg/kg
Al	12400 mg/kg	Li	63.7 mg/kg	Ti	34.0 mg/kg
As	27.4 mg/kg	Mg	8280 mg/kg	V	41.5 mg/kg
Ba	1080 mg/kg	Mn	399 mg/kg	Zn	1400 mg/kg
Be	4.51 mg/kg	Mo	19.1 mg/kg	Ammonia as N	5450 mg/kg
B	186 mg/kg	Na	1650 mg/kg	Kjeldahl nitrogen	4.07 Wt%
Ca	48400 mg/kg	Ni	172 mg/kg	Nitrate	11200 mg/kg
Cd	487 mg/kg	Pb	300 mg/kg	pH	7.10
Co	5.70 mg/kg	Sb	5.78 mg/kg	Phosphorus, total	2.21 Wt%
Cr	345 mg/kg	Se	25.4 mg/kg	Residue, total (TS)	91.5 Wt%
Cu	1100 mg/kg	Si	828 mg/kg	Residue, volatile	59.1 Wt%
Fe	20700 mg/kg	Sn	97.1 mg/kg	S	13600 mg/kg
Hg	6.13 mg/kg	Sr	647 mg/kg	Total organic carbon	28.3 Wt%

RTC-CRM031-40G Trace Metals - Sewage Sludge 3 — 40 g

Certified values

Lot 017359

Ag	128 mg/kg	Ni	227 mg/kg
Al	16200 mg/kg	Pb	304 mg/kg
As	86.5 mg/kg	Sb	72.6 mg/kg
B	160 mg/kg	Se	122 mg/kg
Ba	761 mg/kg	Sn	118 mg/kg
Be	54.6 mg/kg	Sr	601 mg/kg
Ca	44300 mg/kg	Ti	64.0 mg/kg
Cd	87.7 mg/kg	Tl	129 mg/kg
Co	93.1 mg/kg	V	66.9 mg/kg
Cr (total)	109 mg/kg	Zn	1240 mg/kg
Cu	621 mg/kg	Ammonia as N	5130 mg/kg
Fe	19600 mg/kg	Kjeldahl nitrogen total (TKN)	3.68 %
Hg	13.3 mg/kg	Nitrate as N	1540 mg/kg
K	4340 mg/kg	pH	6.89
Li	72.6 mg/kg	Phosphorus total	2.27 %
Mg	8360 mg/kg	Residue total (TS)	91.3 %
Mn	1430 mg/kg	Residue-volatile	53.3 %
Mo	55.7 mg/kg	Sulfur	11400 mg/kg
Na	1010 mg/kg		

Code	Product	Unit

RTC-CRM055-50G Trace Metals - Sewage Sludge 4 — 50 g

The values were determined by USEPA SW846 3050(Nitric Acid/Hot Plate), 3051(Nitric Acid/Microwave), 7000 series(AA), 6010(ICP) and Dutch standard methods (NEN 56..; 57..; 64..; and 66..; series) after total digestion using predominantly nitric/hydrochloric acid mixture (Aqua Regia) in pressurised microwave digester units. The sample is suitable for use by these, or other similar digestion and analytical procedures.

Certified values

Lot 015148

Ag	64.7 mg/kg	Mo	133 mg/kg
Al	14800 mg/kg	Na	758 mg/kg
As	229 mg/kg	Ni	163 mg/kg
B	110 mg/kg	Pb	154 mg/kg
Ba	765 mg/kg	Sb	75.3 mg/kg
Be	167 mg/kg	Se	162 mg/kg
Ca	47200 mg/kg	Sn	148 mg/kg
Cd	60.6 mg/kg	Sr	445 mg/kg
Co	97.0 mg/kg	Tl	82.0 mg/kg
Cr	289 mg/kg	V	245 mg/kg
Cu	482 mg/kg	Zn	1240 mg/kg
Fe	20100 mg/kg	pH	7.16
Hg	12.5 mg/kg	Phosphorus (total)	2.14 Wt%
K	2420 mg/kg	Residue, total (TS)	86.4 Wt%
Mn	693 mg/kg	Residue-volatile	56.2 Wt%
Mg	9210 mg/kg	Sulfur	11500 mg/kg

RTC-CRM101-100G BNAs - API Separator Sludge 1 — 100 g

Polynuclear aromatic hydrocarbons (PAH) contaminated oily sludge from a refinery located in the Western United States. The values were determined by USEPA SW846 (3rd edition) Methods 3540, 3550 and 8270. Sample is suitable for use by these and other similar methods.

Certified values

Chrysene	10.6 mg/kg	Phenanthrene	169 mg/kg
2-Methylnaphthalene	250 mg/kg	Phenol	(30.09) mg/kg
Fluorene	68.4 mg/kg	Pyrene	17 mg/kg
Napthalene	89.5 mg/kg		

RTC-CRM401-225G TCLP Semi-Volatiles - Sludge 1 — 225 g

Organic contaminated soil from a superfund site in the Western United States. Certified using methods USEPA, SW846, 3rd edition, Extraction Method 1311 and analytical methods 8031, 8150 and 8270.

Lot D5401

Certified values

o-Cresol	888 mg/kg	Pentachlorophenol	117 mg/kg
Total cresol	2660 mg/kg	2,4,6-Trichlorophenol	58.7 mg/kg
Lindane	1.05 mg/kg		

Indicative values for m+p Cresol, 2,4-D

TCLP: Total Characteristic Leaching Procedure.
Superfund: US Government funding for the cleaning up of sites in the United States where dumping of hazardous waste has occurred.

Water

Drinking water

Code	Product	Unit
ERM-CA011	Hard drinking water - Metals Hard drinking water sourced from Tamworth (Staffordshire, UK) spiked with high purity metal standards to levels as close to the EU/UK drinking water regulation limits as possible (EC directive 98/83/EC). Certified values Al 209 µg/L; As 10.15 µg/L; B 952 µg/L; Ba 115.2 µg/L; Be 5.01 µg/L; Ca 73.6 mg/L; Cd 4.88 µg/L; Co 4.82 µg/L; Cu 1936 µg/L; Cr 48.2 µg/L; Fe 186 µg/L; K 5.11mg/L; Mg 14.78 mg/L; Mn 48.3 µg/L; Na 22.77 mg/L; Ni 19.27 µg/L; Pb 24.51 µg/L; Sb 5.1 µg /L; Se 9.91 µg/L; Sr 471 µg/L; Vn 4.75 µg/L; Zn 597 µg/L	250 mL
ERM-CA015	Hard drinking water - Anions Hard drinking water sourced from Teddington, UK, containing anions at concentrations close to the maximum permissible levels specified in EU/UK drinking water regulations (EC directive 98/83/EC). Certified values Cl 247 mg/L; F 1.3 mg/L; Nitrate (as NO_3) 45 mg/L; Sulfate (as SO_4) 247 mg/L	250 mL
ERM-CA016	Soft drinking water - Anions Soft drinking water sourced from Plymouth, UK, containing anions at concentrations corresponding to the maximum permissible levels specified in EU/UK drinking water regulations (EC directive 98/83/EC) Certified values Cl 250 mg/L; F 1.5 mg/L; Nitrate (as NO_3) 48 mg/L; Sulfate (as SO_4) 254 mg/L	250 mL
ERM-CA022	Soft drinking water - Metals Certified values Al 204 ± 10 µg/L; As 10.3 ± 1.3 µg/L; Ba 127 ± 13 µg/L; Ca 7.33 ± 0.25 mg/L; Cd 5.26 ± 0.21 µg/L; Cr 50.8 ± 2.7 µg/L; Cu 2100 ± 70 µg/L; Fe 201 ± 2 µg/L; Mg 1.01 ± 0.04 mg/L; Mn 52.5 ± 3.9 µg/L; Na 5.84 ± 0.14 mg/L; Ni 20.5 ± 1.6 µg/L; Pb 26 ± 0.9 µg/L; Zn 628 ± 4 µg/L	250 mL

Rainwater

Code	Product	Unit
NWAES-07	Rain water - Major ions & nutrients Certified values Ammoina (as N) 0.255 mg/L; Calcium 0.224 mg/L; Chloride 0.283 mg/L; Conductivity (25 °C) 7.81 µS/cm; Magnesium 0.0479 mg/L; pH 5.42; Potassium 0.0413 mg/L; Silica (as Si) 0.255 mg/L; Sodium 0.225 mg/L; Sulfate (as SO_4) 1.11 mg/L; Total Nitrogen 0.467 mg/L	500 mL
NWTMRAIN-04	Simulated rain water - Trace elements Lot 1011 Certified values Aluminum (Al) 2.03 µg/L; Antimony (Sb) 0.35 µg/L; Arsenic (As) 1.14 µg/L; Barium (Ba) 0.87 µg/L; Beryllium (Be) 0.38 µg/L; Cadmium (Cd) 0.52 µg/L; Chromium (Cr) 0.88 µg/L; Cobalt (Co) 0.25 µg/L; Copper (Cu) 7.04 µg/L; Iron (Fe) 24.6 µg/L; Lead (Pb) 0.35 µg/L; Lithium (Li) 0.51 µg/L; Manganese (Mn) 6.70 µg/L; Molybdenum (Mo) 0.22 µg/L; Nickel (Ni) 0.91 µg/L; Selenium (Se) 0.84 µg/L; Strontium (Sr) 1.82 µg/L; Thallium (Tl) 0.38 µg/L; Tin (Sn) 0.73 µg/L; Titanium (Ti) 0.52 µg/L; Uranium (U) 0.29 µg/L; Vanadium (V) 0.68 µg/L; Zinc (Zn) 8.40 µg/L Indicative values for Bismuth (Bi), Boron (B) and Rubidium (Rb)	500 mL

Code	Product	Unit

Fresh water

LGC6019 — River water - Trace elements — 250 mL

Collected from the River Thames downstream of Henley-on-Thames at Aston, U.K. Filtered at 0.7 µm and then at 0.45 µm. Stabilised at pH 2 by the addition of concentrated HNO_3.

Certified values

Al ..... 73 µg/L	Cu ..... 15.4 µg/L	Na ..... 24.7 mg/L
Ca ..... 109 mg/L	Fe ..... 287 µg/L	Pb ..... 5.2 µg/L
Cd ..... 0.11 µg/L	K ..... 4.78 mg/L	Zn ..... 59.7 µg/L
Cr ..... 0.78 µg/L	Mg ..... 4.62 mg/L	

LGC6020 — River water - Anions — 250 mL

Collected from the River Thames downstream of Henley-on-Thames at Aston, U.K. Filtered at 0.7 µm and then at 0.45 µm.

Certified values

Cl ..... 38.5 mg/L	Phosphate (as PO_4) .... 1.1 mg/L
Nitrate (as NO_3) ..... 39.4 mg/L	Sulfate (as SO_4) ..... 53.2 mg/L

LGC6025 — River water - Anions — 250 mL

Collected from Menethorpe Beck, Yorkshire, UK, the water was filtered sequentially through 8.0 µm and 0.2 µm membrane filters before the addition of a soluble copper salt solution (as a biocide) to provide a copper concentration of 1 mg/L.

The levels of phosphate and fluoride were adjusted by spiking the base material with high purity salts to achieve the target concentrations.

This material is intended for use in development, validation or quality control of analytical methods for the determination of anions in river waters.

Certified values

Chloride ..... 31.3 mg/L	Nitrate (as NO3) ..... 38.0 mg/L
Fluoride ..... 1.248 mg/L	Sulfate (as SO4) ..... 66.2 mg/L

Additional value

Phosphate (as PO_4) ... 0.08 mg/L

BCR-479 — Fresh water - Nitrate, low level — 100 mL

Produced by adding a solution of the required salt to ultra pure water. Final pH was around 6.8

Certified value

NO_3 ..... 214 µmol/kg

BCR-480 — Fresh water - Nitrate, high level — 100 mL

Produced by adding a solution of the required salt to ultra pure water. Final pH was around 6.8

Certified value

NO_3 ..... 885 µmol/kg

BCR-609 — Ground water - Trace elements (low level) — 500 mL

The material has been filtered at 0.45 µm and acidified with HNO_3 to around pH 1.5

Certified values

Al ..... 47.7 µg/kg	Cd ..... 0.164 µg/kg	Pb ..... 1.63 µg/kg
As ..... 1.2 µg/kg	Cu ..... 2.48 µg/kg	

BCR-610 — Ground water - Trace elements (high level) — 500 mL

The material has been filtered at 0.45 µm and acidified with HNO_3 to around pH 1.5

Certified values

Al ..... 159 µg/kg	Cd ..... 2.94 µg/kg	Pb ..... 7.78 µg/kg
As ..... 10.8 µg/kg	Cu ..... 45.7 µg/kg	

BCR-611 — Ground water - Bromide (low level) — 4 x 25 mL

(Based on IC measurements) The material has been filtered at 0.45 µm and sterilised by autoclaving

Certified value

Br ..... 93 µg/kg

BCR-612 — Ground water - Bromide (high level) — 4 x 25 mL

(Based on IC measurements) The material has been filtered at 0.45 µm and sterilised by autoclaving

Certified value

Br ..... 252 µg/kg

ERM-CA615 — Ground water - Trace elements — 95 mL

Certified values

As ..... 9.9 ± 0.7 µg/L	Hg ..... 0.037 ± 0.004 µg/L	Pb ..... 7.1 ± 0.6 µg/L
Cd ..... 0.106 ± 0.011 µg/L	Mn ..... 107 ± 5 µg/L	
Fe ..... 5.11 ± 0.26 mg/L	Ni ..... 25.3 ± 1.1 µg/L	

Code	Product	Unit
ERM-CA616	**Ground water - Trace elements, conductivity, pH** A natural groundwater fortified with ammonium dihydrogenphosphate Certified values Calcium ..... 42.6 ± 1.4 mg/L Chloride ..... 44.6 ± 0.9 mg/L Magnesium ..... 10.1 ± 0.3 mg/L *ortho*-phosphate ..... 2.24 ± 0.1 mg/L Potassium ..... 5.79 ± 0.15 mg/L Sodium ..... 27.9 ± 0.8 mg/L Electrochemical properties Conductivity (20 °C) ..... 426 ± 5 µS/cm pH (20 °C) ..... 7.12 ± 0.18	95 mL
NIST-1640A	**Natural water - Trace elements** This Standard Reference Material (SRM) is intended for use in evaluating methods used in the determination of trace elements in fresh water. NIST-1640a consists of acidified spring water with mass fractions and mass concentrations assigned for 29 elements, 22 of which were gravimetrically added. The solution contains nitric acid at a volume fraction of approximately 2 %. A unit of NIST-1640a consists of 250 mL of solution in a high-density polyethylene (HDPE) bottle sealed inside an aluminized Mylar pouch. Certified values Ag ..... 8.017 ± 0.042 µg/kg Al ..... 52.6 ± 1.8 µg/kg As ..... 8.010 ± 0.067 µg/kg B ..... 300.7 ± 3.1 µg/kg Ba ..... 150.60 ± 0.74 µg/kg Be ..... 3.002 ± 0.027 µg/kg Cd ..... 3.961 ± 0.072 µg/kg Cr ..... 40.22 ± 0.28 µg/kg Co ..... 20.08 ± 0.24 µg/kg Cu ..... 85.07 ± 0.48 µg/kg Fe ..... 36.5 ± 1.7 µg/kg Mn ..... 40.07 ± 0.35 µg/kg Mo ..... 45.24 ± 0.59 µg/kg Ni ..... 25.12 ± 0.12 µg/kg Pb ..... 12.005 ± 0.040 µg/kg Sb ..... 5.064 ± 0.045 µg/kg Se ..... 19.97 ± 0.16 µg/kg Sr ..... 125.03 ± 0.86 µg/kg Tl ..... 1.606 ± 0.015 µg/kg U ..... 25.15 ± 0.26 µg/kg V ..... 14.93 ± 0.21 µg/kg Zn ..... 55.20 ± 0.32 µg/kg	250 mL
NIST-1641E	**Natural water - Mercury** This Standard Reference Material (SRM) is intended for the calibration of instruments and techniques used for the determination of mercury in natural waters. It is designed for the preparation of calibration solutions and for use as a “spike” sample in a “method-of-additions” analytical procedure. A unit of SRM 1641e consists of 10 ampoules, each ampoule containing approximately 10 mL of solution consisting of a trace amount of mercury in approximately 3 % mass fraction nitric acid and 2 % mass fraction hydrochloric acid, equivalent to amount-of-substance concentration (molarity) values of approximately 0.5 mol/L nitric acid and 0.5 mol/L hydrochloric acid. Certified value Mercury ..... 0.1016 ± 0.0017 mg/kg	10 x 10 mL
NRCORMS-5	**River water - Mercury** Packaged in 50 mL glass ampoules stabilized with 0.5% v/v BrCl Certified mass fraction of mercury ... 26.2 ± 1.3 pg/g	3 x 50 mL
NWBATTLE-02	**River water - Major ions and nutrients** Collected from Battle River, Saskatchewan, Canada Lot 0412 Certified values Alkalinity, Total (as $CaCO_3$) ..... 297 mg/L Boron ..... 0.263 mg/L Calcium ..... 25.1 mg/L Chloride ..... 42.4 mg/L Colour (Hazen units) ..... 20.5 Conductivity (25 °C) ..... 962 µS/cm Dissolved Inorganic Carbon (DIC) ..... 69.1 mg/L Fluoride ..... 0.194 mg/L Hardness, Total (as $CaCO_3$) ..... 152 mg/L Magnesium ..... 21.7 mg/L pH ..... 8.54 Potassium ..... 5.53 mg/L Silica (as Si) ..... 0.255 mg/L Sodium ..... 163 mg/L Sulfate (as SO_4) ..... 149 mg/L Total Kjeldahl Nitrogen (TKN) ..... 0.53 mg/L Total Nitrogen ..... 0.57 mg/L Turbidity (JTU/NTU) ..... 0.157 Indicative values for Dissolved Organic Carbon (DOC) and Nitrate + Nitrite (as N).	500 mL
NWCRANBERRY-05	**Lake water - Major ions and nutrients** Collected from Cranberry Lake, New Jersey, U.S. Lot 0411 Certified values Alkalinity, Total (as $CaCO_3$) ..... 40 mg/L Calcium ..... 13.1 mg/L Chloride ..... 35.5 mg/L Colour (Hazen units) ..... 19.2 Conductivity (25°C) ..... 219 µS/cm Dissolved Inorganic Carbon (DIC) ..... 9.40 mg/L Dissolved Organic Carbon (DOC) ..... 3.60 mg/L Fluoride ..... 0.068 mg/L Hardness, Total (as $CaCO_3$) ..... 55.6 mg/L Magnesium ..... 5.65 mg/L Nitrate + Nitrite (as N) ..... 0.155 mg/L pH ..... 7.71 Potassium ..... 0.70 mg/L Silica (as Si) ..... 2.69 mg/L Sodium ..... 20.2 mg/L Sulfate (as SO_4) ..... 8.87 mg/L Total Kjeldahl Nitrogen (TKN) ..... 0.207 mg/L Total Nitrogen ..... 0.345 mg/L Turbidity (JTU/NTU) ..... 0.171 Indicative value for Boron (B)	500 mL

Code	Product	Unit
NWION-96.4	Natural Lake Water - Major ions and nutrients	500 mL

Certified values

Alkalinity, Total (as $CaCO_3$)	246 mg/L	pH	8.36
Calcium	95.2 mg/L	Potassium	3.53 mg/L
Chloride	74.2 mg/L	Silica (as Si)	0.276 mg/L
Dissolved Inorganic Carbon (DIC)	57.8 mg/L	Sodium	43.3 mg/L
Dissolved Organic Carbon (DOC)	4.80 ml/L	Conductivity (25°C)	831 µS/cm
Fluoride	0.124 mg/L	Sulfate (as SO_4)	76.4 mg/L
Hardness, Total (as $CaCO_3$)	342 mg/L	Colour (Hazen units)	13.8
Magnesium	25.5 mg/L	Total Nitrogen	3.18 mg/L
Nitrate + Nitrite (as N)	2.86 mg/L		

Indicative values for Ammonia (as N), Boron, Total Kjeldahl Nitrogen (as N)

Code	Product	Unit
NWKEJIM-02	Soft lake water - Major ions and nutrients	500 mL

Collected from Kejimkujik Lake, Nova Scotia, Canada

Lot 0411

Certified values

Alkalinity, Gran (as $CaCO_3$)	0.293 mg/L	Magnesium	0.465 mg/L
Aluminium	0.161 mg/L	pH	5.29
Calcium	0.847 mg/L	Potassium	0.225 mg/L
Chloride	5.81 mg/L	Silica (as Si)	0.797 mg/L
Colour (Hazen units)	71.2	Sodium	3.78 mg/L
Conductivity (25°C)	32.3 µS/cm	Sulfate (as SO_4)	2.44 mg/L
Dissolved Organic Carbon (DOC)	7.25 mg/L	Total Nitrogen	0.214 mg/L

Indicative values for Dissolved Inorganic Carbon (DIC), Fluoride, Total Hardness (as $CaCO_3$), Total Kjeldahl Nitrogen (TKN) (as N), Turbidity (JTU/NTU)

Code	Product	Unit
NWLON-07	Natural lake water - Major ions & nutrients	500 mL

Certified values

Alkalinity, Total (as $CaCO_3$)	92 mg/L	Nitrate + Nitrite (as N)	0.444 mg/L
Calcium	34.9 mg/L	pH	8.09
Chloride	22.4 mg/L	Potassium	1.58 mg/L
Conductivity (25°C)	308 µS/cm	Silica (as Si)	0.380 mg/L
Dissolved Organic Carbon (DOC)	22.0 mg/L	Sodium	12.9 mg/L
Fluoride	0.116 mg/L	Sulfate (as SO_4)	26.3 mg/L
Hardness, Total (as $CaCO_3$)	123 mg/L	Total Nitrogen	0.577 mg/L
Magnesium	8.78 mg/L		

Code	Product	Unit
NWMAURI-09	Soft river water - Major ions and nutrients	500 mL

Lot 0313

Certified values

Alkalinity, Gran (as $CaCO_3$)	7.03 mg/L	Nitrate + Nitrite (as N)	0.13 mg/L
Aluminum	0.08 mg/L	pH	6.91
Calcium	2.95 mg/L	Potassium	0.41 mg/L
Chloride	1.47 mg/L	Silica (as Si)	2.53 mg/L
Colour	46 units	Sodium	2.20 mg/L
Conductivity (25°C)	32.3 µS/cm	Sulfate (as SO_4)	3.78 mg/L
Dissolved Organic Carbon (DOC)	6.07 mg/L	Total Nitrogen	0.30 mg/L
Magnesium	0.75 mg/L		

Indicative values

Dissolved Inorganic Carbon (DIC)	1.7 mg/L	Hardness, Total (as $CaCO_3$)	11 mg/L
Fluoride	0.04 mg/L		

Code	Product	Unit
NWPERADE-09	River Water - Major ions and nutrients	500 mL

Collected from the St. Anne River at St-Anne-de-la-Pérade in Québec, Canada

Lot 0412

Certified values

Alkalinity, Gran (as $CaCO_3$)	9.75 mg/L	Nitrate + Nitrite (as N)	0.352 mg/L
Aluminium	0.076 mg/L	pH	7.05
Calcium	4.19 mg/L	Potassium	0.505 mg/L
Chloride	1.89 mg/L	Silica (as Si)	3.11 mg/L
Conductivity (25 °C)	40.2 µS/cm	Sodium	2.14 mg/L
Dissolved Organic Carbon (DOC)	3.70 mg/L	Sulfate (as SO_4)	3.85 mg/L
Magnesium	0.813 mg/L	Total Nitrogen	0.456 mg/L

Indicative values for Colour (Hazen units), Dissolved Inorganic Carbon (DIC) and Fluoride

Code	Product	Unit

NWSANGAMON-03 — River water - Major ions & nutrients — 500 mL

Certified values

Alkalinity, Total (as $CaCO_3$)	96.1 mg/L	Hardness, Total (as $CaCO_3$)	169 mg/L
Boron	0.0352 mg/L	Magnesium	16.0 mg/L
Calcium	40.3 mg/L	Nitrate + Nitrite (as N)	11.7 mg/L
Chloride	16.6 mg/L	pH	8.06
Colour (units)	26.3	Potassium	3.80 mg/L
Conductivity (25°C)	371 µS/cm	Silica (as Si)	3.93 mg/L
Dissolved Inorganic Carbon (DIC)	22.4 mg/L	Sodium	4.90 mg/L
Dissolved Organic Carbon (DOC)	4.40 mg/L	Sulfate (as SO_4)	18.0 mg/L
Fluoride	0.194 mg/L	Total Nitrogen	11.9 mg/L

NWSUPER-05 — Lake water - Major ions & nutrients — 500 mL

Certified values

Alkalinity, Total (as $CaCO_3$)	42.9 mg/L	Nitrate + Nitrite (as N)	0.356 mg/L
Calcium	13.3 mg/L	pH	7.83
Chloride	1.41 mg/L	Potassium	0.507 mg/L
Conductivity (25°C)	98.2 µS/cm	Silica (as Si)	1.06 mg/L
Dissolved Inorganic Carbon (DIC)	9.97 mg/L	Sodium	1.45 mg/L
Dissolved Organic Carbon (DOC)	1.30 mg/L	Sulfate (as SO_4)	3.48 mg/L
Hardness, Total (as $CaCO_3$)	46.0 mg/L	Total Nitrogen	0.427 mg/L
Magnesium	2.85 mg/L		

Sea water

LGC6016 — Estuarine water - Trace metals — 50 mL

Collected from the Severn Estuary, UK, offshore from a heavily industrialised area near Avonmouth

Certified Values

Cd	101 µg/kg	Mn	976 µg/kg	Pb	196 µg/kg
Cu	190 µg/kg	Ni	186 µg/kg		

Indicative values for Ca, K, Mg, Na, Zn

BCR-505 — Estuarine water - Trace elements — 1 L

The material has been filtered at 0.45 µm and acidified with HNO_3 to around pH 1.5

Certified values

Cd	0.80 nmol/kg	Ni	24.1 nmol/kg
Cu	29.4 nmol/kg	Zn	172 nmol/kg

BCR-579 — Coastal sea water - Mercury — 1 L

The material has been filtered at 0.45 µm and acidified with HCl to around pH 1.7

Certified value

Hg 1.9 ng/kg

NRCMOOS-3 — Sea water - Nutrients — 50 mL

Certified values

Phosphate (as P)	0.050 mg/L	Nitrite (as NO_2^-)	0.1630 mg/L
Phosphate (as PO_4^{3-})	0.152 mg/L	Nitrate (as N)	0.322 mg/L
Silicate (as Si)	0.86 mg/L	Nitrate (as NO_3^-)	1.427 mg/L
Silicate (as SiO_2)	1.83 mg/L	Nitrite + Nitrate (as N)	0.372 mg/L
Nitrite (as N)	0.0496 mg/L		

NRCNASS-6 — Seawater - Trace metals — 470 mL

Certified values	Mass fraction	Mass concentration
Arsenic (As)	1.40 ± 0.12 µg/kg	1.43 ± 0.12 µg/L
Cadmium (Cd)	0.0303 ± 0.0019 µg/kg	0.0311 ± 0.0019 µg/L
Chromium (Cr)	0.116 ± 0.008 µg/kg	0.118 ± 0.008 µg/L
Copper (Cu)	0.242 ± 0.025 µg/kg	0.248 ± 0.025 µg/L
Iron (Fe)	0.483 ± 0.045 µg/kg	0.495 ± 0.046 µg/L
Lead (Pb)	0.006 ± 0.002 µg/kg	0.006 ± 0.002 µg/L
Manganese (Mn)	0.516 ± 0.047 µg/kg	0.530 ± 0.050 µg/L
Molybdenum	9.33 ± 0.70 µg/kg	9.89 ± 0.72 µg/L
Nickel (Ni)	0.294 ± 0.025 µg/kg	0.301 ± 0.025 µg/L
Vanadium (V)	1.42 ± 0.16 µg/kg	1.46 ± 0.17 µg/L
Zinc (Zn)	0.251 ± 0.020 µg/kg	0.257 ± 0.020 µg/L

Indicative values for Cobalt (Co) and Uranium (U)

NRCSLEW-3 — Estuarine water - Trace elements — 470 mL

Collected from the San Francisco Bay, California, USA at a depth of 5 metres

Certified values

As	1.36 µg/L	Cu	1.55 µg/L	Pb	0.0090 µg/L
Cd	0.048 µg/L	Fe	0.568 µg/L	V	2.57 µg/L
Co	0.042 µg/L	Mn	1.61 µg/L	Zn	0.201 µg/L
Cr	0.183 µg/L	Ni	1.23 µg/L		

Indicative values for Ag, Mo, U

Water

Code	Product	Unit
NWHAMIL-20.2	Harbour water - Major ions and nutrients	500 mL

Lot 1012

Certified values

Alkalinity, Total (as $CaCO_3$)	110 mg/L	Magnesium	12.6 mg/L
Calcium	46.1 mg/L	Nitrate + Nitrite (as N)	1.99 mg/L
Chloride	72.1 mg/L	pH	8.13
Colour (Hazen units)	5.05	Potassium	3.98 mg/L
Conductivity (25°C)	550 µS/cm	Silica (as Si)	0.876 mg/L
Dissolved Inorganic Carbon (DIC)	25.9 mg/L	Sodium	42.6 mg/L
Dissolved Organic Carbon (DOC)	3.04 mg/L	Sulfate (as SO_4)	43.7 mg/L
Fluoride	0.29 mg/L	Total Nitrogen	2.23 mg/L
Hardness, Total (as $CaCO_3$)	167 mg/L		

Indicative value for Boron (B) and Total Kjeldahl Nitrogen (TKN)

Spiked/fortified water

Code	Product	Unit
ERM-CA408	Simulated rainwater	95 mL

Certified values

Ammonium	0.91 ± 0.028 mg/L	Nitrate	2.01 ± 0.09 mg/L
Chloride	1.96 ± 0.07 mg/L	*ortho*-phosphate	1 ± 0.05 mg/L
Fluoride	0.194 ± 0.008 mg/L	Sulfate	1.46 ± 0.04 mg/L
Magnesium	0.145 ± 0.022 mg/L		

Electrochemical properties

Conductivity	18.7 ± 1.8 µS/cm	pH (20 °C)	6.3 ± 0.6

Code	Product	Unit
NWTM-23.4	Water - Trace elements	500 mL

Lot 1010

Certified values

Aluminum (Al)	94.6 µg/L	Lithium (Li)	2.04 µg/L
Antimony (Sb)	3.27 µg/L	Manganese (Mn)	8.75 µg/L
Arsenic (As)	8.16 µg/L	Molybdenum (Mo)	4.23 µg/L
Barium (Ba)	14.3 µg/L	Nickel (Ni)	4.95 µg/L
Beryllium (Be)	2.02 µg/L	Selenium (Se)	4.59 µg/L
Boron (B)	18.1 µg/L	Strontium (Sr)	111 µg/L
Cadmium (Cd)	2.92 µg/L	Thallium (Tl)	3.99 µg/L
Chromium (Cr)	6.8 µg/L	Tin (Sn)	2.79 µg/L
Cobalt (Co)	7.09 µg/L	Titanium (Ti)	3.19 µg/L
Copper (Cu)	8.51 µg/L	Uranium (U)	5.01 µg/L
Iron (Fe)	14.4 µg/L	Vanadium (V)	1.93 µg/L
Lead (Pb)	2.97 µg/L	Zinc (Zn)	2.47 µg/L

Indicative values for Bismuth (Bi), Gallium (Ga), Rubidium (Rb), Silver (Ag) and Tungsten (W)

Code	Product	Unit
NWTM-25.4	Water - Trace elements	500 mL

Lot 0412

Certified values

Aluminum (Al)	30.3 µg/L	Lithium (Li)	23.9 µg/L
Antimony (Sb)	23.7 µg/L	Manganese (Mg)	25.2 µg/L
Arsenic (As)	27.1 µg/L	Molybdenum (Mo)	27.5 µg/L
Barium (Ba)	27.0 µg/L	Nickel (Ni)	16.2 µg/L
Beryllium (Be)	25.9 µg/L	Selenium (Se)	28.9 µg/L
Boron (B)	40.6 µg/L	Strontium (Sr)	73.5 µg/L
Cadmium (Cd)	23.6 µg/L	Thallium (Tl)	30.5 µg/L
Chromium (Cr)	24.0 µg/L	Tin (Sn)	23.8 µg/L
Cobalt (Co)	27.5 µg/L	Titanium (Ti)	25.4 µg/L
Copper (Cu)	26.6 µg/L	Uranium (U)	27.3 µg/L
Iron (Fe)	31.1 µg/L	Vanadium (V)	27.5 µg/L
Lead (Pb)	27.1 µg/L	Zinc (Zn)	44.4 µg/L

Indicative value for Rubidium (Rb) and Silver (Ag)

Code	Product	Unit
NWTM-26.4	Water – Trace elements	500 mL

Lot 0313

Certified values

Aluminum (Al)	74.5 µg/L	Copper (Cu)	15.0 µg/L	Silver (Ag)	6.9 µg/L
Antimony (Sb)	2.9 µg/L	Iron (Fe)	21.5 µg/L	Strontium (Sr)	106 µg/L
Arsenic (As)	8.7 µg/L	Lead (Pb)	10.4 µg/L	Thallium (Tl)	5.3 µg/L
Barium (Ba)	26.1 µg/L	Lithium (Li)	5.0 µg/L	Tin (Sn)	5.7 µg/L
Beryllium (Be)	3.5 µg/L	Manganese (Mg)	10.9 µg/L	Titanium (Ti)	6.2 µg/L
Boron (B)	46.5 µg/L	Molybdenum (Mo)	7.7 µg/L	Uranium (U)	7.4 µg/L
Cadmium (Cd)	7.1 µg/L	Nickel (Ni)	11.2 µg/L	Vanadium (V)	12.7 µg/L
Chromium (Cr)	12.4 µg/L	Rubidium (Rb)	10.6 µg/L	Zinc (Zn)	37.9 µg/L
Cobalt (Co)	8.1 µg/L	Selenium (Se)	5.4 µg/L		

Indicative values for Gallium (Ga) and Tungsten (W)

Code	Product	Unit

NWTM-28.4 Fortified water - Trace elements — 500 mL

This fortified bulk CRM has concentrations in the low range and is designed for method validation or as a quality control tool.

Lot 0313

Certified values

Aluminum (Al) 54.8 µg/L	Copper (Cu) 6.5 µg/L	Strontium (Sr) 72.7 µg/L
Antimony (Sb) 3.4 µg/L	Iron (Fe) 17.9 µg/L	Thallium (Tl) 3.9 µg/L
Arsenic (As) 6.3 µg/L	Lead (Pb) 4.3 µg/L	Tin (Sn) 3.8 µg/L
Barium (Ba) 16.1 µg/L	Lithium (Li) 3.5 µg/L	Titanium (Ti) 8.2 µg/L
Beryllium (Be) 3.4 µg/L	Manganese (Mg) 7.0 µg/L	Uranium (U) 5.9 µg/L
Boron (B) 18.4 µg/L	Nickel (Ni) 9.9 µg/L	Vanadium (V) 3.2 µg/L
Cadmium (Cd) 1.9 µg/L	Rubidium (Rb) 2.4 µg/L	Zinc (Zn) 29.7 µg/L
Chromium (Cr) 4.9 µg/L	Selenium (Se) 4.6 µg/L	
Cobalt (Co) 3.5 µg/L	Silver (Ag) 3.9 µg/L	

Indicative values for Bismuth (Bi), Gallium (Ga) and Molybdenum (Mo).

NWTM-9.2 Water - Trace elements — 500 mL

Certified values

Aluminum (Al) 36.3 µg/L	Lithium (Li) 4.18 µg/L
Antimony (Sb) 4.35 µg/L	Manganese (Mg) 9.86 µg/L
Arsenic (As) 20.0 µg/L	Molybdenum (Mo) 12.6 µg/L
Barium (Ba) 56.4 µg/L	Nickel (Ni) 19.0 µg/L
Beryllium (Be) 5.94 µg/L	Selenium (Se) 15.4 µg/L
Boron (B) 29.4 µg/L	Strontium (Sr) 111 µg/L
Cadmium (Cd) 3.83 µg/L	Thallium (Tl) 1.99 µg/L
Chromium (Cr) 3.98 µg/L	Tin (Sn) 2.91 µg/L
Cobalt (Co) 2.00 µg/L	Titanium (Ti) 8.00 µg/L
Copper (Cu) 33.8 µg/L	Uranium (U) 1.90 µg/L
Iron (Fe) 113 µg/L	Vanadium (V) 3.13 µg/L
Lead (Pb) 8.42 µg/L	Zinc (Zn) 52.1 µg/L

NWTMDA-53.3 Fortified water - Trace elements — 500 mL

Lot 1011

Certified values

Aluminum (Al) 363 µg/L	Lithium (Li) 11.0 µg/L
Antimony (Sb) 16.9 µg/L	Manganese (Mn) 360 µg/L
Arsenic (As) 34.2 µg/L	Molybdenum (Mo) 252 µg/L
Barium (Ba) 283 µg/L	Nickel (Ni) 311 µg/L
Beryllium (Be) 13.2 µg/L	Selenium (Se) 22.7 µg/L
Bismuth (Bi) 12.0 µg/L	Silver (Ag) 14.6 µg/L
Boron (B) 10.4 µg/L	Strontium (Sr) 369 µg/L
Cadmium (Cd) 118 µg/L	Thallium (Tl) 15.3 µg/L
Chromium (Cr) 340 µg/L	Tin (Sn) 18.4 µg/L
Cobalt (Co) 252 µg/L	Uranium (U) 32.7 µg/L
Copper (Cu) 308 µg/L	Vanadium (V) 315 µg/L
Iron (Fe) 325 µg/L	Zinc (Zn) 385 µg/L
Lead (Pb) 349 µg/L	

Indicative value for Rubidium (Rb)

NWTMDA-54.5 Water – Trace elements — 500 mL

Lot 0313

Certified values

Aluminum (Al) 400 µg/L	Copper (Cu) 414 µg/L	Silver (Ag) 13.3 µg/L
Antimony (Sb) 27.8 µg/L	Iron (Fe) 383 µg/L	Strontium (Sr) 592 µg/L
Arsenic (As) 45.1 µg/L	Lead (Pb) 515 µg/L	Thallium (Tl) 28.3 µg/L
Barium (Ba) 333 µg/L	Lithium (Li) 22.6 µg/L	Tin (Sn) 46.1 µg/L
Beryllium (Be) 17.3 µg/L	Manganese (Mg) 284 µg/L	Titanium (Ti) 33.4 µg/L
Boron (B) 60.5 µg/L	Molybdenum (Mo) 301 µg/L	Uranium (U) 58.7 µg/L
Cadmium (Cd) 158 µg/L	Nickel (Ni) 335 µg/L	Vanadium (V) 349 µg/L
Chromium (Cr) 438 µg/L	Rubidium (Rb) 14.9 µg/L	Zinc (Zn) 545 µg/L
Cobalt (Co) 318 µg/L	Selenium (Se) 35.6 µg/L	

Indicative values for Bismuth (Bi) and Gallium (Ga)

NWTMDA-70.2 Water – Trace elements — 500 mL

Lot 0913

Certified values

Aluminum (Al) 424 µg/L	Chromium (Cr) 397 µg/L	Nickel (Ni) 331 µg/L
Antimony (Sb) 22.0 µg/L	Cobalt (Co) 288 µg/L	Selenium (Se) 27.8 µg/L
Arsenic (As) 42.2 µg/L	Copper (Cu) 408 µg/L	Strontium (Sr) 448 µg/L
Barium (Ba) 320 µg/L	Iron (Fe) 376 µg/L	Uranium (U) 58.1 µg/L
Beryllium (Be) 16.3 µg/L	Lead (Pb) 452 µg/L	Vanadium (V) 315 µg/L
Bismuth (Bi) 12.7 µg/L	Lithium (Li) 22.0 µg/L	Zinc (Zn) 494 µg/L
Boron (B) 36.3 µg/L	Manganese (Mg) 312 µg/L	
Cadmium (Cd) 139 µg/L	Molybdenum (Mo) 265 µg/L	

Indicative values for Rubidium (Rb) and Silver (Ag)

Water

Code	Product	Unit
NWTM-DWS.3	Water - Trace elements	500 mL

Lot 0913

Certified values

Aluminum (Al) 57.0 µg/L	Cobalt (Co) 51.1 µg/L	Selenium (Se) 9.2 µg/L
Antimony (Sb) 3.39 µg/L	Copper (Cu) 163 µg/L	Strontium (Sr) 238 µg/L
Arsenic (As) 4.75 µg/L	Iron (Fe) 223 µg/L	Thallium (Tl) 8.47 µg/L
Barium (Ba) 146 µg/L	Lead (Pb) 6.87 µg/L	Uranium (U) 14.4 µg/L
Beryllium (Be) 14.1 µg/L	Lithium (Li) 20.0 µg/L	Vanadium (V) 45.1 µg/L
Boron (B) 80.2 µg/L	Manganese (Mg) 47.4 µg/L	Zinc (Zn) 388 µg/L
Cadmium (Cd) 4.8 µg/L	Molybdenum (Mo) 65.5 µg/L	
Chromium (Cr) 43.9 µg/L	Nickel (Ni) 82.7 µg/L	

Indicative values for Bismuth (Bi) and Rubidium (Rb)

NWTMRAIN-04	Simulated rain water - Trace elements	500 mL

Lot 1011

Certified values

Aluminum (Al) 2.03 µg/L	Manganese (Mn) 6.70 µg/L
Antimony (Sb) 0.35 µg/L	Molybdenum (Mo) 0.22 µg/L
Arsenic (As) 1.14 µg/L	Nickel (Ni) 0.91 µg/L
Barium (Ba) 0.87 µg/L	Selenium (Se) 0.84 µg/L
Beryllium (Be) 0.38 µg/L	Strontium (Sr) 1.82 µg/L
Cadmium (Cd) 0.52 µg/L	Thallium (Tl) 0.38 µg/L
Chromium (Cr) 0.88 µg/L	Tin (Sn) 0.73 µg/L
Cobalt (Co) 0.25 µg/L	Titanium (Ti) 0.52 µg/L
Copper (Cu) 7.04 µg/L	Uranium (U) 0.29 µg/L
Iron (Fe) 24.6 µg/L	Vanadium (V) 0.68 µg/L
Lead (Pb) 0.35 µg/L	Zinc (Zn) 8.40 µg/L
Lithium (Li) 0.51 µg/L	

Indicative values for Bismuth (Bi), Boron (B) and Rubidium (Rb)

Waste

LGC6175	Landfill leachate - Trace elements	50 mL

Landfill leachate collected and supplied in high density polyethylene bottles.

Certified values

B 8.9 mg/L	Mn 0.33 mg/L
Ca 148 mg/L	Na 860 mg/L
Fe 1.05 mg/L	Ni 0.09 mg/L
K 385 mg/L	Zn 0.28 mg/L
Mg 221 mg/L	

LGC6177	Landfill leachate - Trace elements	50 mL

Landfill leachate collected from a landfill site in Loughborough, Leicestershire, UK

Assessed values

B 9.8 mg/L	K 780 mg/L	Ni 0.21 mg/L
Ca 74.8 mg/L	Mg 73.5 mg/L	P 11.5 mg/L
Cr 0.18 mg/L	Mn 0.14 mg/L	
Fe 3.8 mg/L	Na 1750 mg/L	

ERM-CA713	Waste Water – Trace elements	100 mL

Certified values

As 10.8 ± 0.3 µg/L	Hg 1.84 ± 0.11 µg/L
Cd 5.09 ± 0.20 µg/L	Mn 95 ± 4 µg/L
Cr 20.9 ± 1.3 µg/L	Ni 50.3 ± 1.4 µg/L
Cu 101 ± 7 µg/L	Pb 49.7 ± 1.7 µg/L
Fe 445 ± 27 µg/L	Se 4.9 ± 1.1 µg/L

Occupational hygiene reference materials

Code	Product	Unit

BCR-126A — Lead glass - Constituents — 300 g

Specially selected glass with a composition that displays many typical analytical problems.
Size: 100 x 100 x 10 mm

Certified values

Al_2O_3	0.128 cg/g	Na_2O	3.58 cg/g
BaO	1.036 cg/g	PbO	23.98 cg/g
CaO	1.033 cg/g	Sb_2O_3	0.290 cg/g
Fe_2O_3	0.0055 cg/g	SiO_2	57.80 cg/g
K_2O	10.00 cg/g	ZnO	1.020 cg/g
Li_2O	0.495 cg/g	Density (20°C)	2.9905 g/cm³
MgO	0.512 cg/g	Refractive index (20°C) at 589.3nm	1.55967

IRMM-435 — Pharmaceutical glass - Leaching — 20 vials

This material is intended for performance checks of the complete procedure of autoclave leaching of the inner walls of glass containers and subsequent determination of alkali and/or sodium release by titration and/or flame spectrometry.

	Certified value	Uncertainty
Volume of titration solution 0.01 mol/L HCl per 50 mL of leachate[1)]	0.38 mL	0.04 mL
Sodium release per volume of leachate[1)]	1.41 mg/L	0.14 mg/L
Release of Na_2O per volume of leachate[1)]	1.91 mg/L	0.19 mg/L

[1)] As determined according to the adapted method for alkali release based on the European Pharmacopoeia method and ISO 4802

NIST-2569 — Lead Paint Films for Children's Products — set (8)

This Standard Reference Material (SRM) is intended for use in the evaluation of lead in paint on films or similar matrices using non-destructive, instrumental methods of analysis. SRM 2569 consists of three different paint films each containing a specified amount of lead (Pb) and each supported on polyester sheet.

SRM 2569 is not intended for use in test method calibration for thickness and density. A unit of SRM 2569 consists of three coupons of paint on polyester and five coupons of uncoated polyester. The coupons are approximately 73 mm long by 52 mm wide.

The paint films are cured lacquer having a specified thickness in the range of 20 µm to 45 µm.

Certified values

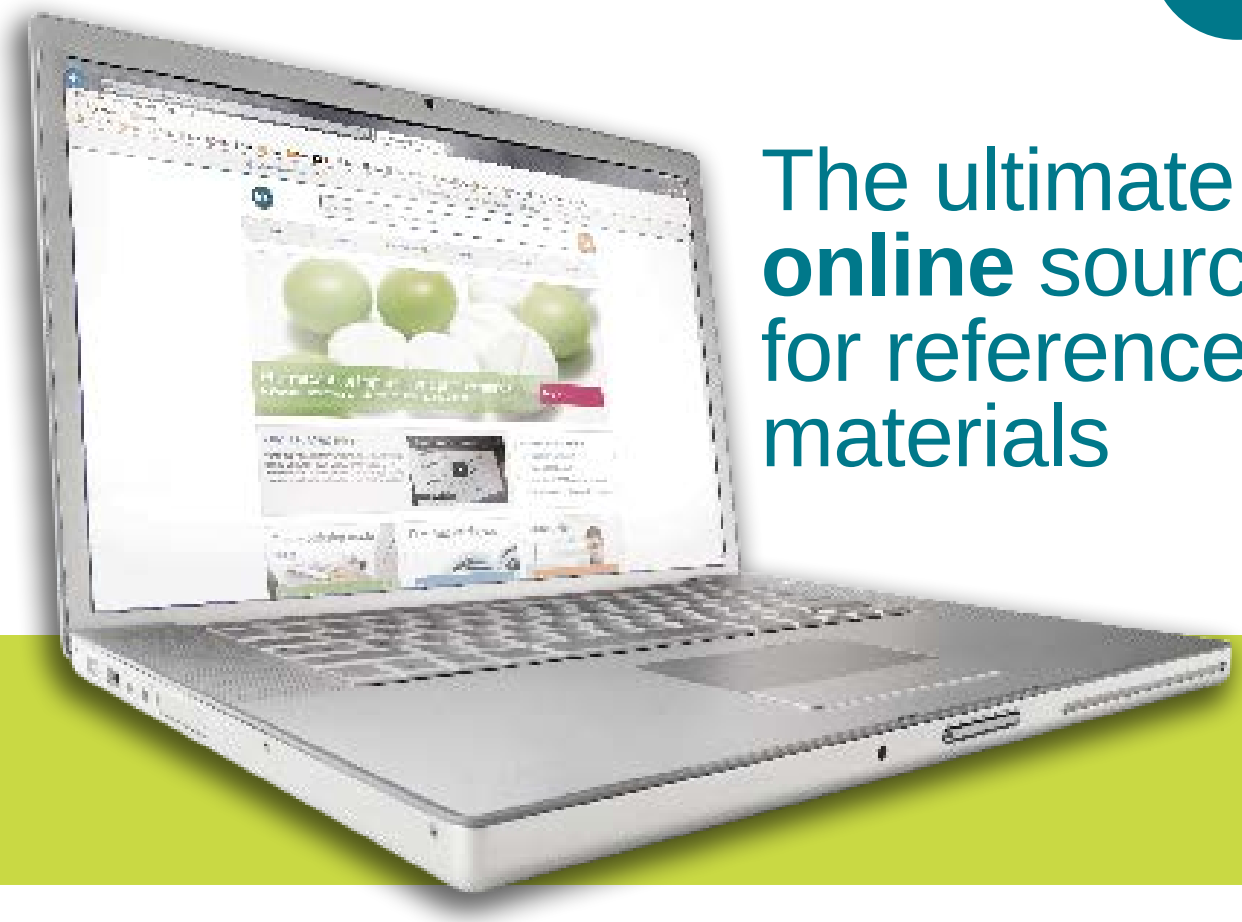
<u>Level 1</u>	
Pb Mass Fraction	<0.2 mg/kg
Mass of Pb per Unit Area	<0.02 µg/cm²
Paint thickness	40.17 µm
<u>Level 2</u>	
Pb Mass Fraction	85 mg/kg
Mass of Pb per Unit Area	0.225 µg/cm²
Paint thickness	22.9 µm
<u>Level 3</u>	
Pb Mass Fraction	314.4 mg/kg
Mass of Pb per Unit Area	1.453 µg/cm²
Paint thickness	39.4 µm

Reference values

<u>Level 1</u>	
Density of paint	1.145 g/cm³
<u>Level 2</u>	
Density of paint	1.158 g/cm³
<u>Level 3</u>	
Density of paint	1.160 g/cm³

Code	Product	Unit
NIST-2570	Lead paint film (white/blank) - Lead This Standard Reference Material (SRM) is intended as a blank for SRM 2571 to SRM 2576, which are used for checking the calibration of portable, hand-held, x-ray fluorescence analyzers when testing for lead in paint coatings on interior and exterior building surfaces. A unit of SRM 2570 consists of a white polyester sheet, approximately 7.6 cm wide, 10.2 cm long, and 0.2 mm thick, coated with a single, lacquer layer, approximately 0.04 mm thick. Each unit is over-coated with a clear, thin, plastic laminate to protect the surface from abrasion. SRM 2570 is one of a set of six paint films (SRM 2570 to SRM 2575) available as SRM 2579a. Certified value Pb.....<0.01 mg/cm^2	2 sheets
NIST-2571	Lead paint film (yellow) - Lead A unit of NIST-2571 consists of a white polyester sheet, approximately 7.6 cm wide, 10.2 cm long, and 0.2 mm thick, coated with a single, yellow-colored paint layer, approximately 0.04 mm thick. A blank, SRM 2570, is also provided. Certified value Pb.....3.58 mg/cm^2	2 sheets
NIST-2572	Lead paint film (orange) - Lead A unit of NIST-2572 consists of a white polyester sheet, approximately 7.6 cm wide, 10.2 cm long, and 0.2 mm thick, coated with a single, orange-colored paint layer, approximately 0.04 mm thick. A blank, NIST-2570, is also provided. Certified value Pb.....1.527 mg/cm^2	2 sheets
NIST-2573	Lead paint film (red) - Lead A unit of NIST-2573 consists of a white polyester sheet, approximately 7.6 cm wide, 10.2 cm long, and 0.2 mm thick, coated with a single, red-colored paint layer, approximately 0.04 mm thick. A blank, NIST-2570, is also provided. Certified value Pb.....1.040 mg/cm^2	2 sheets
NIST-2574	Lead paint film (gold) - Lead A unit of NIST-2574 consists of a white polyester sheet, approximately 7.6 cm wide, 10.2 cm long, and 0.2 mm thick, coated with a single, gold-colored paint layer, approximately 0.04 mm thick. A blank, NIST-2570, is also provided. Certified value Pb.....0.714 mg/cm^2	2 sheets
NIST-2575	Lead paint film (green) - Lead A unit of NIST-2575 consists of a white polyester sheet, approximately 7.6 cm wide, 10.2 cm long, and 0.2 mm thick, coated with a single, green-colored paint layer, approximately 0.04 mm thick. A blank, NIST-2570, is also provided. Certified value Pb.....0.307 mg/cm^2	2 sheets
NIST-2576	Lead paint film (blue) - Lead A unit of NIST-2576 consists of a white polyester sheet, approximately 7.6 cm wide, 10.2 cm long, and 0.2 mm thick, coated with a single, blue-colored paint layer, approximately 0.04 mm thick. A blank, NIST-2570, is also provided. Certified value Pb.....5.59 mg/cm^2	2 sheets
NIST-2579a	Set of six lead paint films (NIST-2570 - NIST-2575) - Lead A unit of NIST-2579a consists of a set of six coated polyester sheets, approximately 7.6 cm wide and 10.2 cm long. Five of the six sheets, NIST-2571 to NIST-2575, are coated with a single, uniform paint layer. The units are color coded and each color indicates a different level of lead content. The paint layer and white polyester sheet are approximately 0.04 mm and 0.2 mm thick, respectively. The sixth sheet, NIST-2570, is coated with a lead-free, lacquer layer of the same thickness as the lead paint samples and is included as a blank. All sheets are over-coated with a clear, thin, plastic laminate to protect the surface from abrasion.	set (6)
NIST-2580	Powdered paint - Lead Certified value Pb.....4.34 %	30 g
NIST-2581	Powdered paint - Lead Certified value Pb.....0.449 %	35 g

Code	Product	Unit
NIST-2582	Powdered paint - Lead Certified value Pb ..... 209 mg/kg	20 g
NIST-2589	Powdered paint - Lead NIST-2589 is composed of paint collected from the interior surface of housing. Certified value Pb .....9.99 % ± 1.6 %	35 g
NIST-RM 8680	Paint on fiberboard - Lead 10.2 x 15.2 x 1.3 cm sheet Indicative value for Pb	sheet
NIST-RM 8785	Filter media - Air particulate matter This Reference Material NIST-RM 8785 is intended primarily for use in the evaluation of analytical methods used to characterise the carbon composition of atmospheric fine-particulate matter (PM) for national air quality monitoring programs. This RM consists of only the fine fraction (nominally < 2.5 µm aerodynamic diameter) of NIST-1649a Urban Dust resuspended in air and filtered onto quartz-fiber filter. NIST-RM 8785 also provides the atmospheric chemistry and ocean-sciences community with a means to inter-compare methods and laboratories for the measurement of elemental (black) carbon. RM 8785 has value-assignments for total carbon, elemental carbon and organic carbon measured according to two thermal-optical methods: the NIOSH and IMPROVE protocols. A unit of NIST-RM 8785 consists of three loaded filters, each uniquely identified by its APM identification number (e.g., APM 1257), its production characteristics, i.e., batch and chamber-column-row (e.g., 12959-30 and IV-D-5, respectively) and its mass of fine NIST-1649a on the filter (e.g., 1948 µg).	3 filter
NIST-RM 8786	Filter blank for NIST-RM 8785 A unit of NIST-RM 8786 consists of a single production blank filter with a 37 mm diameter	filter
RTC-CRM013-50G	Trace Metals - Paint Chips Certified values Cd ..... 37.8 mg/kg Pb..... 643 mg/kg Cr .....618 mg/kg	50 g
RTC-CRM017-20G	Trace Metals - Powdered Paint 1 From a variety of painted surfaces, with an attempt to be as representative as possible of all the standards received for routine analysis by a laboratory. Certified values Pb ..... 6,870 mg/kg pH 7.8	20 g
RTC-CRM920-10G	PCB 1260 - Transformer Oil Oil taken from an electrical transformer. The sample was certified by USEPA SW846, 3rd edition Method 3540A/8081 and is suitable for use by these and other similar methods. Certified value Aroclor 1260 ..... 35.2 mg/kg	10 g
ERM-EC680K	Polyethylene - Trace elements (low level) Certified values As..... 4.1 mg/kg Cl.....102.2 mg/kg Pb ..... 13.6 mg/kg Br ..... 96 mg/kg Cr .....20.2 mg/kg S ..... 76 mg/kg Cd ..... 19.6 mg/kg Hg.....4.64 mg/kg Sb ..... 10.1 mg/kg	100 g
NIST-2783	Air particulate on filter media - Trace elements This Standard Reference Material is an air particulate sample reduced in particle size to simulate $PM_{2.5}$ air particulate matter (particles with an aerodynamic equivalent diameter of 2.5 µm) and deposited on a polycarbonate filter membrane. NIST-2783 included two loaded filters and two blank filters. Certified values Al..... 23210 ng Cu.....404 ng Ni ..... 68 ng As..... 11.8 ng Fe .....26500 ng Pb ..... 317 ng Ba ..... 335 ng K.....5280 ng Sb ..... 71.8 ng Ca ..... 13200 ng Mg .....8620 ng Ti..... 1490 ng Co ..... 7.7 ng Mn .....320 ng V ..... 48.5 ng Cr ..... 135 ng Na.....2860 ng Zn..... 1790 ng Indicative values for Ce, Rb, S, Sc, Si, SM, Th, U, W	4 filter



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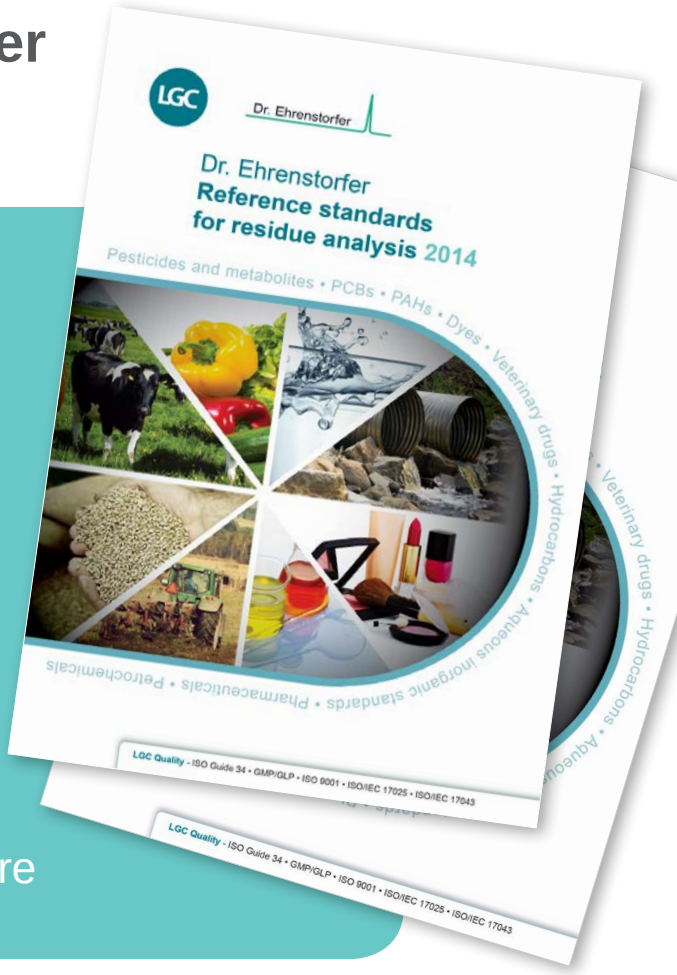

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Reference materials for food testing

Cereals and crops

Rye

Code	Product	Unit
ERM-BC381	Rye flour - Proximates and essential elements One unit contains about 37 g of rye flour filled under argon in a 100 mL amber glass vial. Certified value / Uncertainty Kjeldahl nitrogen ..... 1.562 g/100 g ..... 0.014 g/100 g Total fat ..... 1.36 g/100 g ..... 0.16 g/100 g Ash ..... 1.08 g/100 g ..... 0.11 g/100 g Starch ..... 72.2 g/100 g ..... 1.9 g/100 g K ..... 3.35 mg/g ..... 0.11 mg/g Mg ..... 0.567 mg/g ..... 0.013 mg/g Ca ..... 0.32 mg/g ..... 0.04 mg/g P ..... 2.01 mg/g ..... 0.07 mg/g	vial

Wheat

Code	Product	Unit
BCR-121	Wholemeal flour - Vitamins Certified values B1 (thiamin) ..... 4.63 mg/kg B6 (total pyridoxine) ..... 4.10 mg/kg Folate (total) ..... 0.5 mg/kg	50 g
BCR-396	Wheat flour - Deoxynivalenol (DON) blank Certified value Deoxynivalenol ..... <0.05 mg/kg	150 g
BCR-471	Wheat - Ochratoxin A (blank) Certified value Ochratoxin A ..... < 0.6 µg/kg	55 g
B-MYC0856	Wheat flour - Deoxynivalenol Certified values Deoxynivalenol ..... 877 ± 23 µg/kg	55 g
B-MYC0881	Wheat flour check sample - Ochratoxin A (not certified) Indicative value Ochratoxin A ..... 8.6 ± 3.6 µg/kg	100 g
ERM-BC210	Wheat flour - Total Selenium & Selenomethionine Certified values Total selenium ..... 17.23 mg/kg Selenomethionine ..... 27.4 mg/kg	15 g
ERM-BC382	Wheat flour - Proximates and essential elements One unit contains about 37 g of wheat flour filled under argon in 100 mL amber glass vials. Certified value / Uncertainty Kjeldahl nitrogen ..... 1.851 g/100 g ..... 0.017 g/100 g Total fat ..... 1.39 g/100 g ..... 0.17 g/100 g Ash ..... 0.60 g/100 g ..... 0.10 g/100 g Starch ..... 81.2 g/100 g ..... 1.7 g/100 g K ..... 1.88 mg/g ..... 0.08 mg/g Mg ..... 0.247 mg/g ..... 0.010 mg/g Ca ..... 0.210 mg/g ..... 0.018 mg/g P ..... 1.19 mg/g ..... 0.07 mg/g	vial
ERM-BC600	Wheat flour - Fusarium mycotoxins Certified values Deoxynivalenol (DON) ..... 102 ± 11 µg/kg Nivalenol (NIV) ..... 1000 ± 130 µg/kg Zearalenone (ZON) ..... 90 ± 8 µg/kg	81 g
NIST-1567B	Wheat flour - Trace elements	50 g
NIST-RM 8441a	Wheat - Hardness Set of 50 x 20 g Determination of hardness of bulk or single kernel wheat. Ten separate lots of wheat of varying hardness. Five samples of each wheat .	set

Maize

Code	Product	Unit
BCR-377	Maize flour - Deoxynivalenol (blank) Certified value Deoxynivalenol ..... <0.05 mg/kg	150 g
ERM-BC716	Maize - very low level ZON (+4 degrees) Compound — Certified value Zearalenone ..... <5 µg/kg	60 g
ERM-BC717	Maize Powder - Mycotoxins Compound — Certified value — Uncertainty Zearalenone ..... 83 µg/kg ..... 9 µg/kg	60 g
ERM-BF411A	Genetically Modified Bt-176 Maize (0%) Certified value g/kg Bt-176 maize content ..... < 0.14	1 g
ERM-BF411B	Genetically Modified Bt-176 Maize (0.1%) Certified value g/kg — Uncertainty g/kg Bt-176 maize content ..... 1.00 ..... 0.29	1 g
ERM-BF411C	Genetically Modified Bt-176 Maize (0.5%) Certified value g/kg — Uncertainty g/kg Bt-176 maize content ..... 5.00 ..... 0.6	1 g
ERM-BF411D	Genetically Modified Bt-176 Maize (1%) Certified value g/kg — Uncertainty g/kg Bt-176 maize content ..... 10.0 ..... 0.8	1 g
ERM-BF411E	Genetically Modified Bt-176 Maize (2%) Certified value g/kg — Uncertainty g/kg Bt-176 maize content ..... 20.0 ..... 1.1	1 g
ERM-BF411F	Genetically Modified Bt-176 Maize (5%) Certified value g/kg — Uncertainty g/kg Bt-176 maize content ..... 50.0 ..... 1.8	1 g
ERM-BF412A	Genetically Modified Bt-11 Maize (0%) Certified value g/kg Bt-11 maize content ..... < 0.12	1 g
ERM-BF412B	Genetically Modified Bt-11 Maize (0.1%) Certified value g/kg — Uncertainty g/kg Bt-11 maize content ..... 0.98 ..... 0.29	1 g
ERM-BF412C	Genetically Modified Bt-11 Maize (0.5%) Certified value g/kg — Uncertainty g/kg Bt-11 maize content ..... 4.9 ..... 0.6	1 g
ERM-BF412D	Genetically Modified Bt-11 Maize (1%) Certified value g/kg — Uncertainty g/kg Bt-11 maize content ..... 9.8 ..... 0.9	1 g
ERM-BF412E	Genetically Modified Bt-11 Maize (2%) Certified value g/kg — Uncertainty g/kg Bt-11 maize content ..... 19.6 ..... 1.3	1 g
ERM-BF412F	Genetically Modified Bt-11 Maize (5%) Certified value g/kg — Uncertainty g/kg Bt-11 maize content ..... 48.9 ..... 2.1	1 g
ERM-BF413AK	Genetically modified MON-810 maize powder (blank) Certified value g/kg MON 810 maize mass fraction ..... < 0.9	1 g
ERM-BF413CK	Genetically modified MON-810 maize powder (0.5%) Certified value g/kg — Uncertainty g/kg MON 810 maize mass fraction ..... 4.9 ..... 1.0	1 g

Code	Product	Unit
ERM-BF413EK	Genetically modified MON-810 maize powder (2%)	1 g
	Certified value / Uncertainty	
	MON 810 maize mass fraction: 19.8 g/kg / 1.5 g/kg	
	MON 810 maize DNA copy number ratio: 0.77 % / 0.08 %	
ERM-BF413GK	Genetically modified MON-810 maize powder (10%)	1 g
	Certified value g/kg / Uncertainty g/kg	
	MON 810 maize mass fraction: 99.0 / 5	
ERM-BF414A	Genetically modified GA21 Maize (0%)	vial
	Certified value g/kg	
	GA21 maize content: < 0.8	
ERM-BF414B	Genetically modified GA21 Maize (0.1%)	vial
	Certified value g/kg / Uncertainty g/kg	
	GA21 maize content: 1.0 / 0.8	
ERM-BF414C	Genetically modified GA21 Maize (0.5%)	vial
	Certified value g/kg / Uncertainty g/kg	
	GA21 maize content: 4.9 / 1.0	
ERM-BF414D	Genetically modified GA21 Maize (1%)	vial
	Certified value g/kg / Uncertainty g/kg	
	GA21 maize content: 9.9 / 1.1	
ERM-BF414E	Genetically modified GA21 Maize (2%)	vial
	Certified value g/kg / Uncertainty g/kg	
	GA21 maize content: 17.2 / 1.2	
ERM-BF414F	Genetically modified GA21 Maize (5%)	vial
	Certified value g/kg / Uncertainty g/kg	
	GA21 maize content: 42.9 / 1.7	
ERM-BF415A	Genetically modified NK603 Maize (0%)	vial
	Certified value g/kg	
	NK603 maize content: < 0.4	
ERM-BF415B	Genetically modified NK603 Maize (0.1%)	vial
	Certified value g/kg / Uncertainty g/kg	
	NK603 maize content: 1.0 / 0.4	
ERM-BF415C	Genetically modified NK603 Maize (0.5%)	vial
	Certified value g/kg / Uncertainty g/kg	
	NK603 maize content: 4.9 / 0.5	
ERM-BF415D	Genetically modified NK603 Maize (1%)	vial
	Certified value g/kg / Uncertainty g/kg	
	NK603 maize content: 9.8 / 0.7	
ERM-BF415E	Genetically modified NK603 Maize (2%)	vial
	Certified value / Uncertainty	
	NK603 maize content: 19.6 g/kg / 0.9 g/kg	
	NK603 maize DNS copy number ratio: 0.95 % / 0.11 %	
ERM-BF415F	Genetically modified NK603 Maize (5%)	vial
	Certified value g/kg / Uncertainty g/kg	
	NK603 maize content: 49.1 / 1.3	
ERM-BF416A	Genetically modified MON 863 Maize (0%)	vial
	Certified value[1] g/kg	
	MON 863 Maize: < 1.0	
	1) No contamination was detected in the non-GM material when applying event-specific MON 863 realtime PCR with a detection limit of 0.8 g / kg. With a confidence level of 95 % the MON 863 mass fraction is below the certified value.	
ERM-BF416B	Genetically modified MON 863 Maize (0.1%)	vial
	Certified value g/kg / Uncertainty g/kg	
	MON 863 Maize: 1.0 / -0.3 ; +1.0	

Cereals and crops

Code	Product	Unit
ERM-BF416C	Genetically modified MON 863 Maize (1%) Certified value g/kg Uncertainty g/kg MON 863 Maize ..... 9.8 .....-0.7 ; +1.2	vial
ERM-BF416D	Genetically modified MON 863 Maize (10%) Certified value g/kg Uncertainty g/kg MON 863 Maize ..... 98.5 .....-2.2 ; +2.5	vial
ERM-BF417A	Stacked Genetically modified MON 863 x MON 810 Maize Certified value[1] g/kg MON 863 x MON 810 Maize ..... < 1.0 1) No contamination was detected in the non-GM material when applying event-specific MON 863 realtime PCR with a detection limit of 0.8 g/kg and no contamination was detected when applying eventspecific MON 810 real-time PCR with a detection limit of 1.1g /kg. With a confidence level of 95 % the MON 863 x MON 810 maize mass fraction is below the certified value.	vial
ERM-BF417B	Stacked Genetically modified MON 863 x MON 810 Maize Certified value g/kg Uncertainty g/kg MON 863 x MON 810 Maize ..... 1.0 .....-0.2 ; +1.0	vial
ERM-BF417C	Stacked Genetically modified MON 863 x MON 810 Maize Certified value g/kg Uncertainty g/kg MON 863 x MON 810 Maize ..... 9.8 .....-0.7 ; +1.2	vial
ERM-BF417D	Stacked Genetically modified MON 863 x MON 810 Maize Certified value g/kg Uncertainty g/kg MON 863 x MON 810 Maize ..... 98.5 .....-2.0 ; +2.4	vial
ERM-BF418A	Genetically modified 1507 Maize (0%) Certified value[1] g/kg 1507 maize ..... < 0.5 1) No contamination was detected in the non-GM material when applying event-specific 1507 real-time PCR with a detection limit of 0.4 g/kg. With a confidence level of 95 % the 1507 maize mass fraction is below the certified value.	vial
ERM-BF418B	Genetically modified 1507 Maize (0.1%) Certified value g/kg Uncertainty g/kg 1507 maize ..... 1.0 .....-0.2; +0.6	vial
ERM-BF418C	Genetically modified 1507 Maize (1%) Certified value g/kg Uncertainty g/kg 1507 maize ..... 9.9 .....-0.6; +0.8	vial
ERM-BF418D	Genetically modified 1507 Maize (10%) Certified value g/kg Uncertainty g/kg 1507 maize ..... 98.6 .....-1.7; +2.0	vial
ERM-BF420A	Genetically modified 3272 Maize (0%) Certified value g/kg Event 3272 maize ..... < 1.3	vial
ERM-BF420B	Genetically modified 3272 Maize (1%) Certified value g/kg Uncertainty g/kg Event 3272 maize ..... 9.8 ..... 1.2	vial
ERM-BF420C	Genetically modified 3272 Maize (10%) Certified value g/kg Uncertainty g/kg Event 3272 maize 98 8	vial
ERM-BF423A	Genetically modified MIR604 Maize (0%) Certified value[1] g/kg MIR604 maize ..... < 0.9 1) No contamination was detected in the non-GM material when applying event-specific MIR604 real-time PCR with a detection limit of 0.8 g/kg. With a confidence level of 95 % the MIR604 maize mass fraction is below the certified value.	vial
ERM-BF423B	Genetically modified MIR604 Maize (0.1%) Certified value g/kg Uncertainty g/kg MIR604 maize ..... 1.0 .....-0.3; +1.0	vial

Code	Product	Unit
ERM-BF423C	Genetically modified MIR604 Maize (1%)	vial
	Certified value g/kg — Uncertainty g/kg	
	MIR604 maize ..... 9.8 ..... -0.9; +1.3	
ERM-BF423D	Genetically modified MIR604 Maize (10%)	vial
	Certified value g/kg — Uncertainty g/kg	
	MIR604 maize ..... 98.5 ..... -2.6; +2.9	
ERM-BF424A	Genetically modified 59122 Maize (0%)	vial
	Certified value[1] g/kg	
	59122 maize ..... < 1.2	
	1) No contamination was detected in the non-GM material when applying event-specific 59122 real-time PCR with a detection limit of 1.0 g/kg. With a confidence level of 95 % the 59122 maize mass fraction is below the certified limit value. The certified value is traceable to the SI.	
ERM-BF424B	Genetically modified 59122 Maize (0.1%)	vial
	Certified value g/kg — Uncertainty g/kg	
	59122 maize ..... 1.0 ..... -0.2; +1.2	
ERM-BF424C	Genetically modified 59122 Maize (1%)	vial
	Certified value g/kg — Uncertainty g/kg	
	59122 maize ..... 9.9 ..... -0.8; +1.4	
ERM-BF424D	Genetically modified 59122 Maize (10%)	vial
	Certified value g/kg — Uncertainty g/kg	
	59122 maize ..... 98.7 ..... -5.8; +5.9	
ERM-BF427A	Genetically modified 98140 Maize seed (blank)	vial
	Certified value g/kg	
	98140 Maize ..... < 0.4	
ERM-BF427B	Genetically modified 98140 Maize seed (0.5%)	vial
	Certified value g/kg — Uncertainty g/kg	
	98140 Maize ..... 5 ..... 0.6	
ERM-BF427C	Genetically modified 98140 Maize seed (2%)	vial
	Certified value — Uncertainty	
	98140 Maize ..... 20 g/kg ..... 0.8 g/kg	
	98140 Maize DNA copy number ratio ..... 1.75 % 0.13%	
ERM-BF427D	Genetically modified 98140 Maize seed (10%)	vial
	Certified value g/kg — Uncertainty g/kg	
	98140 Maize 100 4	
ERM-BF433A	DAS-40278-9 Maize (blank)	vial
	Certified value g/kg	
	DAS-40278-9 maize ..... <0.3	
ERM-BF433B	DAS-40278-9 Maize (nominal 0.5% GMO)	vial
	Certified value g/kg — Uncertainty g/kg	
	DAS-40278-9 maize ..... 5.0 ..... 0.6	
ERM-BF433C	DAS-40278-9 Maize (nominal 1% GMO)	vial
	Certified value g/kg — Uncertainty g/kg	
	DAS-40278-9 maize ..... 10.0 ..... 0.9	
ERM-BF433D	DAS-40278-9 Maize (nominal 10% GMO)	vial
	Certified value g/kg — Uncertainty g/kg	
	DAS-40278-9 maize 100 8	

Code	Product	Unit

Vegetable oils

BCR-162R — Soya-maize oil blend - Fatty acids — 5.5 g

Certified values

Fatty acid	Relative Mass Fraction in g FAME / 100 g total FAME
16:0 (n-Hexadecanoic acid)	10.74 ± 0.16
18:0 (n-Octadecanoic acid)	2.82 ± 0.04
9c-18:1 (n-Octadecenoic acid)	25.4 ± 0.4
9c,12c-18:2 (n-Octadecadienoic acid)	54.13 ± 0.25
9c,12c,15c-18:3 (n-Octadecatrienoic acid)	3.35 ± 0.05

BCR-446 — Rapeseed - Oil content (low) — 153 g

Certified values

"As is" oil	39.49 g/100 g
Moisture and volatiles	7.01 g/100 g
Dry basis oil	42.48 g/100 g

BCR-459 — Coconut oil - PAHs (blank) — 45 g

Compound	Certified value µg/kg	Compound	Certified value µg/kg
Pyrene	<0.9	Benzo(a)pyrene	<0.3
Chrysene	<0.6	Benzo(ghi)perylene	<0.2
Benzo(k)fluoranthene	<0.2	Indeno(1,2,3-cd)pyrene	<0.2

NIST-3274 — Botanical oils - Omega-3 and omega-6 fatty acids — 4 x 1.2 mL

This Standard Reference Material® (SRM®) is intended primarily for use in validating analytical methods for the determination of fatty acids in botanical oils and similar matrices. This SRM can also be used for quality assurance when assigning values to in-house control materials. A unit of SRM 3274 consists of a total of four ampoules, one each of four seed oils (3274-1 Borage [Borago officinalis], 3274-2 Evening Primrose [Oenothera biennis], 3274-3 Flax [Linium usitatissimum], and 3274-4 Perilla [Perilla frutescens]). Each ampoule contains approximately 1.2 mL of oil under argon.

	Mass fraction (mg/g)			
	3274-1 Borage	3274-2 Evening Primrose	3274-3 Flax	3274-4 Perilla
Octanoic Acid (C8:0) (Caprylic Acid)		(0.053 ± 0.010)		(0.021 ± 0.002)
Decanoic Acid (C10:0) (Capric Acid)				(0.020 ± 0.011)
Dodecanoic Acid (C12:0) (Lauric Acid)			(0.016 ± 0.001)	
Tetradecanoic Acid (C14:0) (Myristic Acid)	(0.62 ± 0.11)	**0.363 ± 0.030**	**0.271 ± 0.008**	(0.206 ± 0.025)
Pentadecanoic Acid (C15:0)	**0.074 ± 0.008**	**0.099 ± 0.011**	**0.151 ± 0.016**	(0.061 ± 0.009)
Hexadecanoic Acid (C16:0) (Palmitic Acid)	**110 ± 12**	**58.2 ± 6.1**	**44.8 ± 5.0**	**56.4 ± 5.5**
(Z)-9-Hexadecenoic Acid (C16:1 n-7) (Palmitoleic Acid)	**1.77 ± 0.14**	**0.402 ± 0.043**	**0.383 ± 0.031**	**0.776 ± 0.081**
Heptadecanoic Acid (C17:0) (Margaric Acid)	(0.500 ± 0.086)	(0.188 ± 0.008)	(0.212 ± 0.011)	(0.159 ± 0.040)
Octadecanoic Acid (C18:0) (Stearic Acid)	(33.1 ± 4.0)	**18.30 ± 0.838**	**30.4 ± 2.4**	**20.9 ± 1.1**
(Z)-9-Octadecenoic Acid (C18:1 n-9) (Oleic Acid)	**148.7 ± 8.7**	**68.9 ± 3.7**	**165.7 ± 6.2**	**166.8 ± 7.8**
(E)-9-Octadecenoic Acid (t-C18:1 n-9) (Elaidic Acid)	(0.117 ± 0.020)			
(Z)-11-Octadecenoic Acid (C18:1 n-7) (Vaccenic Acid)	**5.76 ± 0.18**	**5.95 ± 0.37**	(5.61 ± 0.16)	(7.89 ± 0.22)
(Z,Z)-9,12-Octadecadienoic Acid (C18:2 n-6) (Linoleic Acid)	**374 ± 35**	**742 ± 24**	**171 ± 11**	**160 ± 14**
(Z,Z,Z)-9,12,15-Octadecatrienoic Acid (C18:3 n-3) (α-Linolenic Acid)	(3.45 ± 0.63)	(2.72 ± 0.51)	**579 ± 30**	**629 ± 28**
(Z,Z,Z)-6,9,12-Octadecatrienoic Acid (C18:3 n-6) (γ-Linolenic Acid)	**251 ± 24**	**99.9 ± 4.1**	(1.55 ± 0.25)	(2.08 ± 0.48)
Eicosanoic Acid (C20:0) (Arachidic Acid)	(2.13 ± 0.46)	(2.71 ± 0.37)	(1.04 ± 0.15)	(1.21 ± 0.26)
(Z)-11-Eicosenoic Acid (C20:1 n-9) (Gondoic Acid)		**1.84 ± 0.12**		
(Z,Z,Z,Z)-5,8,11,14-Eicosatetraenoic Acid (C20:4 n-6) (Arachidonic Acid)		(0.022 ± 0.002)	**0.633 ± 0.029**	
Heneicosanoic Acid (C21:0)	(2.36 ± 0.32)	(0.132 ± 0.029)		(0.083 ± 0.004)
Docosanoic Acid (C22:0) (Behenic Acid)	**1.509 ± 0.070**	(0.91 ± 0.25)	(0.62 ± 0.13)	(0.118 ± 0.004)
Tetracosanoic Acid (C24:0) (Lignoceric Acid)	(0.334 ± 0.074)	(0.369 ± 0.060)	(0.308 ± 0.059)	(0.096 ± 0.022)
(Z)-15-Tetracosenoic Acid (C24:1)	**7.80 ± 0.61**			**0.084 ± 0.003**

( ) Indicative values
Certified values in bold

Code	Product	Unit
NIST-3278	Edible oils - Tocopherols	5 amps.

This Standard Reference Material® (SRM®) is intended primarily for use in validating analytical methods for the determination of tocopherols in edible oils and similar matrices. This SRM can also be used for quality assurance when assigning values to in-house control materials. A unit of NIST-3278 consists of five ampoules of oil each containing approximately 1 mL of material under argon.

Certified mass fraction values for tocopherols in NIST-3278

alpha-Tocopherol	290.1 ± 6.5 µg/g	gamma-Tocopherol	111.5 ± 5.8 µg/g
beta-Tocopherol	11.38 ± 0.52 µg/g	delta-Tocopherol	28.8 ± 1.8 µg/g

Fruit and vegetables

Code	Product	Unit
BCR-383	Haricots verts (beans) - Major nutrients	100 g

Certified values

N (Kjeldahl)	1.1 g/100 g	Ca	2.9 g/100 g
Dietary fibre (AOAC 1985/1988)	11.9 g/100 g	K	7.8 g/100 g
Ash at 550°C	2.4 g/100g	Na	0.08 g/100 g

Indicative values for glucose, fructose, sucrose, starch and sugars, dietary fibre (Englyst)

Code	Product	Unit
BCR-431	Brussels sprout - Vitamins	20 g

Certified values

Vitamin C (total ascorbate)	4830 mg/kg
Niacin	43 mg/kg

Code	Product	Unit
BCR-485	Mixed vegetables - Vitamins	25 g

Certified values

B_1 (thiamin)	3.07 mg/kg	trans-α-Carotene	10.5 mg/kg	total-β-Carotene	25.6 mg/kg
B_6 (total pyridoxine)	4.8 mg/kg	trans-β-Carotene	23.7 mg/kg	Lutein	12.5 mg/kg
Folate (total)	3.15 mg/kg	total-α-Carotene	9.8 mg/kg	Lutein+Zeaxanthin	22.3 mg/kg

Code	Product	Unit
BCR-679	White cabbage - Trace elements	15 g

Certified values

Cd	1.66 mg/kg	Hg	6.3 µg/kg	Sr	11.8 mg/kg
Cu	2.89 mg/kg	Mo	14.8 mg/kg	Tl	3.0 µg/kg
Fe	55.0 mg/kg	Ni	27.0 mg/kg	Zn	79.7 mg/kg
Mn	13.3 mg/kg	Sb	20.6 µg/kg		

Code	Product	Unit
ERM-BC514	Haricots beans - Dietary fibre (-20)	25 g

Certified using five different methods of dietary fibre analysis

Certified values

AOAC 1990	25.6 g/100 g	AOAC 1992 MES-TRIS	25.9 g/100 g
Englyst (GC)	19.8 g/100 g	Englyst (colorimetry)	20.1 g/100 g
Uppsala	23.7 g/100 g		

Code	Product	Unit
ERM-BC515	Carrot - Dietary fibre (-20)	25 g

Certified using five different methods of dietary fibre analysis

Certified values

AOAC 1990	31.1 g/100 g	AOAC 1992 MES-TRIS	29.5 g/100 g
Englyst (GC)	27.1 g/100 g	Englyst (colorimetry)	25.2 g/100 g
Uppsala	29.8 g/100 g		

Code	Product	Unit
ERM-BC516	Apple - Dietary fibre (-20)	25 g

Certified using five different methods of dietary fibre analysis

Certified values

AOAC 1990	16.46 g/100 g	AOAC 1992 MES-TRIS	14.9 g/100 g
Englyst (GC)	13.7 g/100 g	Englyst (colorimetry)	13.4 g/100 g
Uppsala	16.2 g/100g		

Code	Product	Unit
ERM-BC517	Full fat soya - Dietary fibre (-20)	25 g

Certified using five different methods of dietary fibre analysis

Certified values

AOAC 1990	12.6 g/100 g	AOAC 1992 MES-TRIS	12.4 g/100 g
Englyst (GC)	11.9 g/100 g	Englyst (colorimetry)	12.3 g/100 g
Uppsala	12.8 g/100 g		

Code	Product	Unit
NIST-2385	Slurried spinach - Elements, carotenoids	4 x 70 g

Certified values

Ca	624 ± 40 mg/kg	Mg	368 ± 30 mg/kg	Zn	8.37 ± 0.37 mg/kg
Fe	17.1 ±1.9 mg/kg	Mn	3.81 ±0.10 mg/kg		
K	3650 ± 250 mg/kg	P	327.7 ± 6.6 mg/kg		
Total Lutein (incl. esters)	32.9 ± 6.5 mg/kg	Total beta-Carotene	19.2 ± 2.9 mg/kg		

Indicative values for proximates, energy content, elements, vitamins and trans-beta-carotene.

Code	Product	Unit
NIST-3250	Serenoa repens (Fruit) - Phytosterols and fatty acids	each

This Standard Reference Material (SRM) is intended primarily for use in validating analytical methods for the determination of phytosterols and fatty acids in the fruit of *Serenoa repens* (saw palmetto) and similar matrices. A unit of NIST-3250 consists of five packets, each containing approximately 6 g of ground saw palmetto fruit.

Certified concentration values for selected phytosterols in NIST-3250

Phytosterols	Mass Fraction (mg/g, dry-mass basis)
Campesterol	0.1175 ± 0.0025
β-Sitosterol	0.454 ± 0.018
Stigmasterol	0.0477 ± 0.0020

Certified concentration values for selected fatty acids (as triglycerides) in NIST-3250

Fatty acids	Mass Fraction (%, dry-mass basis)
Octanoic acid (C8:0) (Caprylic acid)	0.1072 ± 0.0027
Decanoic acid (C10:0) (Capric acid)	0.1175 ± 0.0055
Dodecanoic acid (C12:0) (Lauric acid)	2.962 ± 0.062
Tetradecanoic acid (C14:0) (Myristic acid)	1.103 ± 0. 065
Hexadecanoic acid (C16:0) (Palmitic acid)	0.869 ± 0.027
(Z)-9-Hexadecenoic acid (C16:1 n-7) (Palmitoleic acid)	0.0158 ± 0.0010
Octadecanoic acid (C18:0) (Stearic acid)	0.1791 ± 0.0054
(Z)-9-Octadecenoic acid (C18:1 n-9) (Oleic acid)	3.24 ± 0.15
(Z)-11-Octadecenoic acid (C18:1 n-7) (Vaccenic acid)	0.0547 ± 0.0030
(Z,Z)-9,12-Octadecadienoic acid (C18:2 n-6) (Linoleic acid)	0.824 ± 0.055
(Z,Z,Z)-9,12,15-Octadecatrienoic acid (C18:3 n-3) (Linolenic acid)	0.194 ± 0.025
Eicosanoic acid (C20:0) (Arachidic acid)	0.0097 ± 0.0002
Docosanoic acid (C22:0) (Behenic acid)	0.0066 ± 0.0002
Tetracosanoic acid (C24:0) (Lignoceric acid)	0.0107 ± 0.0003

Reference concentration values for selected fatty acids (as triglycerides) and for free fatty acids

Code	Product	Unit
NIST-3251	Serenoa repens extract - Phytosterols, fatty acids, ß-carotene, and gamma-tocopherol	5 x 1 mL

This Standard Reference Material (SRM) is intended primarily for use in validating analytical methods for the determination of phytosterols, fatty acids, β-carotene, and γ-tocopherol in extracts of Serenoa repens (saw palmetto) and similar matrices. This SRM can also be used for quality assurance when assigning values to in-house control materials. A unit of NIST-3251 consists of five ampoules, each containing approximately 1 mL of saw palmetto extract.

Certified concentration values for selected phytosterols in NIST-3251

Phytosterols	Mass Fraction (mg/g)
Campesterol	0.533 ± 0.031
β-Sitosterol	1.666 ± 0.064
Stigmasterol	0.247 ± 0.040

Certified concentration values for selected fatty acids (as triglycerides) in NIST-3251

Fatty acids	Mass Fraction (%)
Octanoic acid (C8:0) (Caprylic acid)	2.677 ± 0.032
Decanoic acid (C10:0) (Capric acid)	2.690 ± 0.055
Dodecanoic acid (C12:0) (Lauric acid)	26.51 ± 0.66
Tridecanoic acid (C13:0)	0.069 ± 0.002
Tetradecanoic acid (C14:0) (Myristicacid)	10.68 ± 0.16
Pentadecanoic acid (C15:0)	0.0518 ± 0.0018
Hexadecanoic acid (C16:0) (Palmitic acid)	8.55 ± 0.20
Heptadecanoic acid (C17:0)	0.0640 ± 0.0024
Octadecanoic acid (C18:0) (Stearic acid)	1.757 ± 0.021
(Z)-9-Octadecenoic acid (C18:1 n-9) (Oleic acid)	34.73 ± 0.43
(Z)-11-Octadecenoic acid (C18:1 n-7) (Vaccenic acid)	0.834 ± 0.020
(Z,Z)-9,12-Octadecadienoic acid (C18:2 n-6) (Linoleic acid)	6.018 ± 0.093
(Z,Z,Z)-9,12,15-Octadecatrienoic acid (C18:3 n-3) (Linolenic acid)	1.248 ± 0.027
Eicosanoic acid (C20:0) (Arachidic acid)	0.0936 ± 0.0033
(Z)-11-Eicosenoic acid (C20:1 n-9) (Gondoic acid)	0.1939 ± 0.0031
Docosanoic acid (C22:0) (Behenic acid)	0.0646 ± 0.0016
Tetracosanoic acid (C24:0)	0.0929 ± 0.0028

Certified concentration values for total β-carotene and γ-tocopherol in NIST-3251

	Mass Fraction (µg/g)
Total β-carotene	46.8 ± 4.6
γ-Tocopherol	280 ± 13

Reference concentration value for cycloartenol, selected fatty acids (as triglycerides), selected free fatty acids, for β-carotene isomers and δ-tocopherol, brassicasterol and lupeol

Code	Product	Unit
NIST-3254	Green tea (Camellia sinensis) leaves - Catechins and xanthines	5 x 3 g

This Standard Reference Material (SRM®) is intended primarily for use in validating analytical methods for the determination of catechins and xanthines in the leaves of Camellia sinensis (green tea) and similar matrices. NIST-3254 can also be used for quality assurance when assigning values to in-house control materials. A unit of NIST-3254 consists of five packets, each containing approximately 3 g of leaf powder.

Certified Mass Fraction Values for Selected Catechins and Xanthines in NIST-3254

	Mass Fraction (mg/g, dry-mass basis)		Mass Fraction (mg/g, dry-mass basis)
(–)-Epicatechin	9.0 ± 1.6	(–)-Gallocatechin gallate	0.99 ± 0.21
(–)-Epicatechin gallate	12.7 ± 1.2	Caffeine	23.5 ± 1.8
(–)-Epigallocatechin	25.2 ± 4.5	Theobromine	0.463 ± 0.052
(–)-Epigallocatechin gallate	52.0 ± 2.2		

Indicative values for (+)-Catechin, (–)-Gallocatechin, Gallic acid and L-Theanine

Code	Product	Unit
NIST-3255	Green tea (Camellia sinensis) extract - Catechins and xanthines	5 x 1 g

This Standard Reference Material (SRM®) is intended primarily for use in validating analytical methods for the determination of catechins and xanthines in extracts of Camellia sinensis (green tea) and similar matrices. NIST-3255 can also be used for quality assurance when assigning values to in-house control materials. A unit of NIST-3255 consists of five packets, each containing approximately 1 g of extract.

Certified Mass Fraction Values for Selected Catechins and Xanthines in NIST-3255

	Mass Fraction (mg/g, dry-mass basis)		Mass Fraction (mg/g, dry-mass basis)
(+)-Catechin	9.17 ± 0.93	(–)-Gallocatechin	22.0 ± 1.7
(–)-Epicatechin	47.3 ± 6.7	(–)-Gallocatechin gallate	39.0 ± 2.0
(–)-Epicatechin gallate	100.3 ± 7.8	Caffeine	36.9 ± 2.7
(–)-Epigallocatechin	81.8 ± 6.5	Theobromine	0.867 ± 0.076
(–)-Epigallocatechin gallate	422.0 ± 19.0		

Indicative values for (–)-Epigallocatechin methylgallate, Gallic acid, L-Theanine and Theophylline.

NIST-3256	Green tea-containing solid oral dosage form - Catechins, xanthines and toxic elements	5 x 2.5 g

This Standard Reference Material (SRM®) is intended primarily for use in validating analytical methods for the determination of catechins, xanthines, and toxic elements in solid oral dosage forms containing green tea and in similar matrices. NIST-3256 can also be used for quality assurance when assigning values to in-house control materials. A unit of NIST-3256 consists of five packets, each containing approximately 2.5 g of powdered material.

Certified Mass Fraction Values for Selected Catechins, Gallic Acid, and Xanthines in NIST-3256

	Mass Fraction (mg/g, dry-mass basis)		Mass Fraction (mg/g, dry-mass basis)
(+)-Catechin	2.63 ± 0.18	(–)-Gallocatechin	7.55 ± 0.28
(–)-Epicatechin	12.0 ± 2.6	Gallic acid	13.10 ± 0.49
(–)-Epicatechin gallate	17.1 ± 2.6	Caffeine	70.0 ± 2.6
(–)-Epigallocatechin	30.7 ± 5.7	Theobromine	1.04 ± 0.15
(–)-Epigallocatechin gallate	71.1 ± 6.6		

Certified Mass Fraction Values for Toxic Elements in NIST-3256

	Mass Fraction mg/kg, dry-mass basis)		Mass Fraction mg/kg, dry-mass basis)
Arsenic (As)	0.269 ± 0.019	Lead (Pb)	0.316 ± 0.030
Cadmium (Cd)	0.025 ± 0.002	Mercury (Hg)	0.014 ± 0.002

Indicative values for (–)-Gallocatechin gallate, L-Theanine and Theophylline.

NIST-3258	Bitter Orange (Fruit) - Alkaloids	5 x 5 g

This Standard Reference Material (SRM®) is intended primarily for use in validating analytical methods for the determination of alkaloids in bitter orange-containing solid oral dosage forms and similar matrices. This SRM can also be used for quality assurance when assigning values to in-house control materials. A unit of NIST-3258 consists of five packets, each containing approximately 5 g of ground fruit.

Certified Concentration Values for Selected Alkaloids

	Mass Fraction (mg/g, dry-basis)		Mass Fraction (mg/g, dry-basis)
Synephrine	9.10 ± 0.15	Total Citrus Alkaloids	9.41 ± 0.17
N-Methyltyramine	0.178 ± 0.012		

Indicative values for Octopamine

NIST-3261	Bitter Orange Dietary Supplemental Suite - Alkaloids	set

This Standard Reference Material (SRM®) consists of two packets each of three bitter orange-related SRMs: NIST-3258 Bitter Orange (Fruit), NIST-3259 Bitter Orange Extract, and NIST-3260 Bitter Orange-Containing Solid Oral Dosage Form. These SRMs are intended primarily for use in validating analytical methods for the determination of citrus alkaloids in bitter orange-containing matrices. These SRMs can also be used for quality assurance when assigning values to in-house control materials. The materials in the suite of bitter orange dietary supplement SRMs have been developed to cover a range of natural matrices and analyte levels.

Code	Product	Unit
NIST-3276	Carrot extract in oil - Carotenoids, tocopherols, selected fatty acids Standard Reference Material NIST-3276 is intended primarily for use in validating analytical methods for the determination of carotenoids, tocopherols, and fatty acids in carrot extract in oil and similar matrices. A unit of NIST-3276 consists of five ampoules of the oil, each containing approximately 1 mL of material under argon. Certified values for Carotenoids and Tocopherols δ-Tocopherol ..... 373 ± 34 µg/g γ-Tocopherol..... 443 ± 64 µg/g Certified values for selected fatty acids (as Triglycerides) Hexadecanoic Acid (C16:0) .....1.36 ± 0.05 % (Palmitic Acid) (Z)-9-Hexadecenoic Acid (C16:1 n-7) .....0.0147 ± 0.0014 % (Palmitoleic Acid) Heptadecanoic Acid (C17:0) .....0.0213 ± 0.0017 % Octadecanoic Acid (C18:0) .....1.14 ± 0.02 % (Stearic Acid) (Z)-9-Octadecenoic Acid (C18:1 n-9).....3.68 ± 0.06 % (Oleic Acid) (Z)-11-Octadecenoic Acid (C18:1 n-7).....0.519 ± 0.012 % (Vaccenic Acid) (Z,Z)-9,12-Octadecadienoic Acid (C18:2 n-6).....6.64 ± 0.11 % (Linoleic Acid) (Z,Z,Z)-9,12,15-Octadecatrienoic Acid (C18:3 n-3) .....0.816 ± 0.014 % (Linolenic Acid) Eicosanoic Acid (C20:0).....0.0578 ± 0.0025 % (Arachidic Acid) (Z)-11-Eicosenoic Acid (C20:1 n-9).....0.353 ± 0.006 % (Gondoic Acid) Docosanoic Acid (C22:0).....0.126 ± 0.016 % (Behenic Acid) Tetracosanoic Acid (C24:0).....0.0242 ± 0.0018 % (Lignoceric Acid)	5 amps.
NIST-3281	Cranberry (Fruit) - Organic acids A unit of NIST-3281 consists of five packets, each containing approximately 6 g of freeze-dried, powdered fruit. Certified values (dry-mass basis) Citric acid..... 79.2 ± 6.4 mg/g Malic acid..... 40.6 ±2.3 mg/g Quinic acid ..... 47.8 ± 6.8 mg/g Shikimic acid..... 2.09 ± 0.72 mg/g	5 x 6 g
NIST-3283	Cranberry extract - Organic acids A unit of NIST-3283 consists of five packets, each containing approximately 2.5 g of cranberry extract. Certified mass fraction values for organic acids (dry-mass basis) Citric acid..... 18.7 ± 2.3 mg/g Malic acid..... 9.9 ± 1.2 mg/g Quinic acid ..... 16.6 ± 3.7 mg/g Indicative values for organic acids and anions	5 x 2.5 g
NIST-3284	Cranberry-containing solid oral dosage form - Organic acids A unit of NIST-3284 consists of five packets, each containing approximately 2.5 g of powdered material. Certified mass fraction values for organic acids (dry-mass basis) Citric acid..... 34.7 ± 4.8 mg/g Malic acid..... 19.9 ± 1.9 mg/g Quinic acid ..... 25.9 ± 3.5 mg/g Indicative values for organic acids and anions	5 x 2.5 g
NIST-3285	Mixed Berry-containing solid oral dosage form - Organic acids This Standard Reference Material (SRM) is intended primarily for use in validating analytical methods for the determination of organic acids in solid oral dosage forms containing bilberries, blueberries, and cranberries and in similar matrices. This SRM can also be used for quality assurance when assigning values to in-house control materials. A unit of NIST-3285 consists of five packets, each containing approximately 2.5 g of powdered material. Certified values (dry-mass basis) Malic acid.....22.83 ± 0.53 mg/g Quinic acid ... 24.87 ± 0.42 mg/g Reference values for organic acids and anions	5 x 2.5 g
NIST-3287	Blueberry (Fruit) - Organic acids A unit of NIST-3287 consists of five packets, each containing approximately 5 g of freeze-dried, powdered fruit. Certified values mass fraction values for organic acids (dry-mass basis) Citric acid..... 24.33 ± 0.63 mg/g Malic acid..... 1.711 ± 0.060 mg/g Quinic acid ..... 25.53 ± 0.73 mg/g Certified mass fraction values for elements (dry-mass basis) Calcium (Ca)..... 323 ± 16 mg/kg Copper (Cu)..... 2.22 ± 0.16 mg/kg Iron (Fe)..... 12.20 ± 0.74 mg/kg Magnesium (Mg) ..... 313.7 ± 7.2 mg/kg Manganese (Mn)..... 8.47 ± 0.59 mg/kg Phosphorus (P)..... 671 ±21 mg/kg Potassium (K) ..... 4490 ± 220 mg/kg Zinc (Zn)..... 6.49 ± 0.61 mg/kg Indicative values for organic acids, anions, proximates, sugars, total dietary fiber, sodium, calories, vitamins and amino acids	5 x 5 g

Cereals and crops

Code	Product	Unit
NIST-3291	Bilberry extract - Organic acids A unit of NIST-3291 consists of five packets, each containing approximately 1 g of bilberry extract. Certified mass fraction values for organic acids (dry-mass basis) Citric acid ..... 22.9 ± 2.5 mg/g Malic acid ..... 5.9 ± 1.7 mg/g Quinic acid ..... 12.2 ± 2.2 mg/g Indicative values for organic acids and anions	5 x 1 g

Soy

ERM-BF410AK	Soya seed powder - GTS 40-3-2 Soya (0%) Certified value GTS 40-3-2 Soya ..... < 0.7 g/kg	1 g
ERM-BF410BK	Soya seed powder - GTS 40-3-2 Soya (0.1%) Certified value g/kg — Uncertainty g/kg GTS 40-3-2 Soja ..... 1.0 ..... 0.5	1 g
ERM-BF410DK	Soya seed powder - GTS 40-3-2 Soya (1%) Certified value g/kg — Uncertainty g/kg GTS 40-3-2 Soya ..... 10.0 ..... 1.0	1 g
ERM-BF410GK	Soya seed powder - GTS 40-3-2 Soya (10 %) Certified value g/kg — Uncertainty g/kg GTS 40-3-2 Soya 100 7	1 g
NIST-3234	Soy Flour NIST-3234 is intended primarily for validation of methods for determining proximates, vitamins, elements, and amino acids in soy flour and similar materials. This SRM can also be used for quality assurance when assigning values to in-house reference materials. The SRM is a defatted soy flour prepared by a commercial manufacturer. A unit of SRM 3234 consists of one bottle that contains approximately 50 g of material and is sealed inside an aluminized pouch. Certified mass fraction values for selected elements Ca ..... 3191 ± 56 mg/kg Cu ..... 15.34 ± 0.26 mg/kg Fe ..... 80.3 ± 2.7 mg/kg Mg ..... 3487 ± 60 mg/kg Mn ..... 36.78 ± 0.88 mg/kg P ..... 8080 ± 210 mg/kg K ..... 25010 ± 560 mg/kg Zn ..... 48.9 ± 1.1 mg/kg Certified concentrations for selected vitamins Thiamine (Vitamin B_1) ..... 8.60 ± 0.20 mg/kg Riboflavin (Viatmin B_2) ..... 3.363 ± 0.041 mg/kg Niacin ..... 4.59 ± 0.17 mg/kg Niacinamide ..... 11.49 ± 0.13 mg/kg Total Vitamin B3 as Niacinamide ..... 16.04 ± 0.24 mg/kg Pantothenic Acid ..... 11.45 ± 0.12 mg/kg Choline ..... 2799 ± 18 mg/kg Reference values for Mass Fraction Values (Dry-Mass Basis) for Sodium and Carnitine, Proximates, Fatty Acids, Total Dietary Fibre, Calories and Amino Acids. Reference values for Mass Fraction Values (Dry-Mass Basis) for Sodium and Carnitine, Proximates, Fatty Acids, Total Dietary Fibre, Calories and Amino Acids.	50 g
ERM-BC517	Full fat soya - Dietary fibre (-20) Certified using five different methods of dietary fibre analysis Certified values AOAC 1990 ..... 12.6 g/100 g Englyst (GC) ..... 11.9 g/100 g Uppsala ..... 12.8 g/100 g AOAC 1992 MES-TRIS ..... 12.4 g/100 g Englyst (colorimetry) ..... 12.3 g/100 g	25 g

Rapeseed

ERM-BC190	Rapeseed (colza) - Total glucosinolate and sulfur Certified values Total glucosinolate ..... 23 mmol/kg S ..... 4.72 g/kg	20 g
ERM-BC366	Rapeseed (colza) - Total glucosinolate and sulfur (+4) Certified values Total glucosinolate ..... 11.9 mmol/kg S ..... 3.31 g/kg	20 g
ERM-BC367	Rapeseed (colza) - Total glucosinolate and sulfur Certified values Total glucosinolate ..... 99 mmol/kg S ..... 10.3 g/kg	20 g

Rice

BCR-465 — Rice flour - Amylose (low level) — 10 g

Certified value

Amylose ..... 15.4 g/100 g

BCR-466 — Rice flour - Amylose (medium level) — 10 g

Certified value

Amylose ..... 23.1 g/100 g

BCR-467 — Rice flour - Amylose (high level) — 10 g

Certified value

Amylose ..... 27.7 g/100 g

ERM-BC211 — Rice - As species (-20) — 10 g

Certified values

Total arsenic ..... 260 µg/kg
Dimethylarsinic acid ..... 119 µg/kg
The sum of arsenite and arsenate..... 124 µg/kg

IRMM-804 — Rice flour - Trace elements — 15 g

Compound	Certified value (mg/kg)	Uncertainty (mg/kg)
As	0.049	0.004
Cd	1.61	0.07
Cu	2.74	0.24
Mn	34.2	2.3
Pb	0.42	0.07
Zn	23.1	1.9

NIST-1568B — Rice flour - Trace elements — 50 g

Produced from 100% long grain rice from Arkansas.

Certified values

Al ..... 4.21 µg/g	Fe ..... 7.42 µg/g	P ..... 1530 µg/g
As ..... 0.285 µg/g	Hg ..... 0.00591 µg/g	Rb ..... 6.198 µg/g
Br ..... 8.31 µg/g	K ..... 1282 µg/g	S ..... 1200 µg/g
Ca ..... 118.4 µg/g	Mg ..... 559 µg/g	Se ..... 0.365 µg/g
Cd ..... 0.0224 µg/g	Mn ..... 19.2 µg/g	Zn ..... 19.42 µg/g
Cl ..... 301.1 µg/g	Mo ..... 1.451 µg/g	
Cu ..... 2.35 µg/g	Na ..... 6.74 µg/g	

Indicative values for Co, I, Pb, Sb, Sn, U, V, W

Fish and shellfish products

Code	Product	Unit

BCR-349 — Cod liver oil - PCBs — 2 g

Compound	Certified value µg/kg	Uncertainty µg/kg
PCB 28	68	8
PCB 52	149	21
PCB 101	372	18
PCB 118	460	40
PCB 153	940	40
PCB 180	282	23

BCR-463 — Tuna fish - Total mercury and methyl-mercury — 15 g

Certified values

Methylmercury	3.04 mg/kg
Total mercury	2.85 mg/kg

BCR-543 — Mussel - dc-Saxitoxin — 15 g

Mussel material BCR-543 is intended to serve as an analytical blank or as a material enriched with the saxitoxin enrichment solution (BCR-663).
As an analytical blank it may serve
- to establish recovery values for a method of analysis at various levels of contamination
- to check the specific background level of the laboratories methods.
BCR-543 enriched with saxitoxin enrichent solution (BCR-663) may be used to validate the laboratory's own methods.

Compound	Certified value (mg/kg)	Uncertainty (mg/kg)
Saxitoxin·2HCl	<0.07	
Saxitoxin·2HCl	0.48	0.06
DC-Saxitoxin·2HCl	<0.04	

This reference material is a "dual usage" material and requires special export/ import documents under the authority of IRMM.

BCR-598 — Cod liver oil - Organochlorine pesticides — 5 g

Compound	Certified value µg/kg	Uncertainty µg/kg
Hexachlorobenzene	55.7	2
alpha-HCH	42	3
beta-HCH	16	3
gamma-HCH	23	4
gamma-Chlordane	6.9	1.6
alpha-Chlordane	24.4	1.8
Oxychlordane	11	1.8
trans-Nonachlor	39	4
Dieldrin	59	4
4,4'-DDE	0.61×10^3	0.04×10^3
2,4'-DDD	30	4
4,4'-DDD	0.40×10^3	0.03×10^3
4,4'-DDT	0.179×10^3	0.018×10^3

BCR-627 — Tuna fish tissue - Arsenic species — 10 g

Certified values

Arsenobetaine	52 µmol/kg	total As	4.8 mg/kg
Dimethylarsinic acid	2 µmol/kg		

BCR-668 — Mussel tissue - Trace elements — 10 g

Certified values

Ce	89 µg/kg	La	80 µg/kg	Tb	1.62 µg/kg
Dy	8.9 µg/kg	Lu	0.389 µg/kg	Th	10.7 µg/kg
Er	4.5 µg/kg	Nd	54 µg/kg	Tm	0.480 µg/kg
Eu	2.79 µg/kg	Pr	12.3 µg/kg	U	56 µg/kg
Gd	13.0 µg/kg	Sm	11.2 µg/kg	Y	59 µg/kg

Indicative values for As, Cd, Co, Cr, Cr, Cs, Ho, Fe, Mo, Sc, Yb and Zn

BCR-682 — Mussel tissue - PCBs — 70 g

Certified values

PCB 28	0.30 µg/kg	PCB 138	4.6 µg/kg	PCB 170	0.17 µg/kg
PCB 52	0.78 µg/kg	PCB 149	5.7 µg/kg	PCB 180	0.77 µg/kg
PCB 118	2.6 µg/kg	PCB 153	9.2 µg/kg		

Code	Product	Unit
BCR-718	Canned fresh herring - PCBs The material consists of approx. 70 g of minced sterilised muscle of herring to which butylhydroxy toluene (BHT) was added as an antioxidant. Certified values PCB 28 ..... 0.41 µg/kg; PCB 118 ..... 1.78 µg/kg; PCB 153 ..... 4.62 µg/kg PCB 52 ..... 1.00 µg/kg; PCB 128 ..... 0.62 µg/kg; PCB 156 ..... 0.19 µg/kg PCB 101 ..... 2.12 µg/kg; PCB 138 ..... 2.97 µg/kg; PCB 170 ..... 0.35 µg/kg PCB 105 ..... 0.63 µg/kg; PCB 149 ..... 2.58 µg/kg; PCB 180 ..... 0.795 µg/kg	70 g
BCR-719	Canned fresh chub - PCBs The material consists of approx. 70 g of minced sterilised muscle of chub to which butylhydroxy toluene (BHT) was added as an antioxidant. Certified values PCB 77 ..... 196 ng/kg; PCB 126 ..... 20.0 ng/kg PCB 81 ..... 13.6 ng/kg; PCB 169 ..... 1.80 ng/kg	70 g
BCR-725	Salmon tissue - Flumequine and oxolinic acid Certified value µg/kg / Uncertainty µg/kg Flumequine ..... 1170 ..... 210 Oxolinic acid 600 100	vial
CIF-MUSSEL-DSP-2	Mussel matrix with DSP toxins CIF-MUSSEL-DSP-2 is a homogenous mussel tissue with known concentrations of Okadaic acid, DTX-1 and DTX-3. This Quality Control material is suitable for a range of analytical DSP testing functions including ongoing method control, method development and instrument calibration. Okadaic acid 361 µg/kg Dinophysistoxin-1 (DTX-1) 206 µg/kg Dinophysistoxin-3 (DTX-3) 283 µg/kg	4 g

Code	Product	Unit
CIL-EDF-2524	Clean Fish (slurry) - Organic contaminants	10 g

Reference values

Polychlorinated dioxins and furans

2,3,7,8-TCDD	0.07 ± 0.06 ng/kg	1,2,3,7,8-PeCDF	0.09 ± 0.06 ng/kg
1,2,3,7,8-PeCDD	0.15 ± 0.03 ng/kg	2,3,4,7,8-PeCDF	0.21 ± 0.14 ng/kg
1,2,3,4,7,8-HxCDD	0.06 ± 0.03 ng/kg	Total-PeCDF	1.22 ± 1.13 ng/kg
1,2,3,6,7,8-HxCDD	0.24 ± 0.14 ng/kg	1,2,3,4,7,8-HxCDF	0.09 ± 0.14 ng/kg
1,2,3,7,8,9-HxCDD	0.07 ± 0.05 ng/kg	1,2,3,6,7,8-HxCDF	0.08 ± 0.12 ng/kg
1,2,3,4,6,7,8-HpCDD	0.29 ± 0.54 ng/kg	2,3,4,6,7,8-HxCDF	0.08 ± 0.05 ng/kg
Total HpCDD	0.23 ± 0.30 ng/kg	Total-HxCDF4	0.55 ± 1.31 ng/kg
OCDD	0.59 ± 0.82 ng/kg	1,2,3,4,6,7,8-HpCDF	0.17 ± 0.28 ng/kg
2,3,7,8-TCDF	2.42 ± 0.74 ng/kg	OCDF	0.24 ± 0.58 ng/kg
Total TCDF	2.49 ± 0.92 ng/kg		

Polychlorinated biphenyls

2,2',5-TriCB (#18)	86.0 ± 60.4 ng/kg
2,4,4'-TriCB (#28)	253 ± 244 ng/kg
3,4,4'-TriCB (#37)	12.6 ± 4.52 ng/kg
2,2',3,5'-TetraCB (#44)	274 ± 192 ng/kg
2,2',4,5'-TetraCB (#49)	176 ± 41.6 ng/kg
2,2',5,5'-TetraCB (#52)	653 ± 200 ng/kg
2,3',4,4'-TetraCB (#66)	218 ± 212 ng/kg
2,4,4',5-TetraCB (#74)	348 ± 398 ng/kg
3,3',4,4'-TetraCB (#77)	8.82 ± 4.16 ng/kg
3,4,4',5-TetraCB (#81)	1.27 ± 2.52 ng/kg
2,2',4,4',5-PentaCB (#99)	588 ± 120 ng/kg
2,2',4,5,5'-PentaCB (#101)	1,130 ± 274 ng/kg
2,3,3',4,4'-PentaCB (#105)	280 ± 80.4 ng/kg
2,3,3',4',6-PentaCB (#110)	789 ± 170 ng/kg
2,3,4,4',5-PentaCB (#114)	18.6 ± 5.98 ng/kg
2,3',4,4',5-PentaCB (#118)	692 ± 104 ng/kg
2',3,4,4',5-PentaCB (#123)	11.4 ± 9.24 ng/kg
3,3',4,4',5-PentaCB (#126)	2.14 ± 1.24 ng/kg
2,2',3,3',4,4'-HexaCB (#128)	127 ± 62.2 ng/kg
2,2',3,4,4',5-HexaCB (#137)	31.8 ± 26.8 ng/kg
2,2',3,4,4',5'-HexaCB (#138)	1,110 ± 400 ng/kg
2,2',3,4,5,5'-HexaCB (#141)	152 ± 119 ng/kg
2,2',3,4',5,5'-HexaCB (#146)	261 ± 69.2 ng/kg
2,2',3,4',5',6-HexaCB (#149)	608 ± 788 ng/kg
2,2',3,5,5',6-HexaCB (#151)	279 ± 212 ng/kg
2,2',4,4',5,5'-HexaCB (#153)	1,360 ± 516 ng/kg
2,3,3',4,4',5-HexaCB (#156)	64.7 ± 18.4 ng/kg
2,3,3',4,4',5'-HexaCB (#157)	19.2 ± 8.68 ng/kg
2,3,3',4,4',6-HexaCB (#158)	73.2 ± 52.6 ng/kg
2,3',4,4',5,5'-HexaCB (#167)	24.7 ± 17.1 ng/kg
3,3',4,4',5,5'-HexaCB (#169)	0.65 ± 0.46 ng/kg
2,2',3,3',4,4',5-HeptaCB (#170)	119 ± 42.0 ng/kg
2,2',3,3',4,5,5'-HeptaCB (#172)	38.6 ± 12.0 ng/kg
2,2',3,3',4',5,6-HeptaCB (#177)	126 ± 47.8 ng/kg
2,2',3,3',5,5',6-HeptaCB (#178)	68.2 ± 5.80 ng/kg
2,2',3,4,4',5,5'-HeptaCB (#180)	412 ± 182 ng/kg
2,2',3,4,4',5',6-HeptaCB (#183)	125 ± 59.4 ng/kg
2,2',3,4',5,5',6-HeptaCB (#187)	357 ± 222 ng/kg
2,3,3',4,4',5,5'-HeptaCB (#189)	6.16 ± 2.72 ng/kg
2,2',3,3',4,4',5,5'-OctaCB (#194)	48.1 ± 25.6 ng/kg
2,2',3,3',4,4',5',6-OctaCB (#196)	44.8 ± 56.6 ng/kg
2,2',3,3',4,5,5',6'-OctaCB (#199)	81.7 ± 67.4 ng/kg
2,2',3,3',4,4',5,5',6-NonaCB (#206)	10.4 ± 2.06 ng/kg
DecaCB (#209)	14.4 ± 1.08 ng/kg

Polybrominated diphenyl ethers

2,4,4'-TriBDE (#28)	26.6 ± 45.8 ng/kg	2,2',4,4',6-PentaBDE (#100)	113 ± 93.6 ng/kg
2,2',4,4'-TetraBDE (#47)	712 ± 818 ng/kg	2,2',4,4',5,5'-HexaBDE (#153)	21.6 ± 14.7 ng/kg
2,3',4,4'-TetraBDE (#66)	23.4 ± 21.6 ng/kg	2,2',4,4',5,6'-HexaBDE (#154)	30.9 ± 39.8 ng/kg
2,2',4,4',5-PentaBDE (#99)	184 ± 86.2 ng/kg		

Polyaromatic hydrocarbons

Acenaphthene	967 ± 604 ng/kg	Fluoranthene	4.930 ± 1.310 ng/kg
Acenaphthylene	516 ± 290 ng/kg	Fluorene	4.400 ± 3.530 ng/kg
Anthracene	592 ± 284 ng/kg	Naphthalene	15.600 ± 15.800 ng/kg
Benzo[b]fluoranthene	794 ± 157 ng/kg	Phenanthrene	12.000 ± 14.000 ng/kg
Benzo[k]fluoranthene	222 ± 7.60 ng/kg	Pyrene	6.300 ± 1.630 ng/kg
Chrysene	720 ± 314 ng/kg		

Pesticides

4.4'-DDE	10.100 ± 2.440 ng/kg	alpha-Hexachlorocyclohexane	267 ± 226 ng/kg
4.4'-DDD	1.640 ± 756 ng/kg	Lindane(gamma-HCH)	390 ± 136 ng/kg
4.4'-DDT	976 ± 1.390 ng/kg	Hexachlorobenzene	783 ± 360 ng/kg
Dieldrin	488 ± 74.6 ng/kg	cis-Nonachlor	211 ± 126 ng/kg
Endosulfan-I	534 ± 378 ng/kg	trans-Nonachlor	1.130 ± 542 ng/kg

Code	Product	Unit
CIL-EDF-2525	Naturally Contaminated Fish (slurry) - Organic contaminants	10 g

Reference values

Polychlorinated dioxins and furans

2,3,7,8-TCDD	17.0 ± 3.90 ng/kg	1,2,3,7,8-PeCDF	4.58 ± 1.42 ng/kg
Total TCDD	16.8 ± 1.54 ng/kg	2,3,4,7,8-PeCDF	14.5 ± 4.04 ng/kg
1,2,3,7,8-PeCDD	3.71 ± 0.90 ng/kg	Total PeCDF	23.4 ± 6.66 ng/kg
Total PeCDD	3.68 ± 0.84 ng/kg	1,2,3,4,7,8-HxCDF	5.95 ± 1.52 ng/kg
1,2,3,4,7,8-HxCDD	0.33 ± 0.18 ng/kg	1,2,3,6,7,8-HxCDF	1.73 ± 0.54 ng/kg
1,2,3,6,7,8-HxCDD	2.03 ± 0.60 ng/kg	1,2,3,7,8,9-HxCDF	0.10 ± 0.20 ng/kg
1,2,3,7,8,9-HxCDD	0.30 ± 0.14 ng/kg	2,3,4,6,7,8-HxCDF	1.04 ± 0.30 ng/kg
Total HxCDD	2.52 ± 1.10 ng/kg	Total HxCDF	10.7 ± 6.18 ng/kg
1,2,3,4,6,7,8-HpCDD	0.48 ± 0.36 ng/kg	1,2,3,4,6,7,8-HpCDF	0.59 ± 0.44 ng/kg
Total HpCDD	0.56 ± 0.62 ng/kg	1,2,3,4,7,8,9-HpCDF	0.16 ± 0.32 ng/kg
OCDD	1.71 ± 1.38 ng/kg	Total HpCDF	1.13 ± 1.48 ng/kg
2,3,7,8-TCDF	24.3 ± 4.74 ng/kg	OCDF	0.38 ± 0.50 ng/kg
Total TCDF	27.7 ± 9.40 ng/kg		

Polychlorinated biphenyls

2,2',5-TriCB (#18)	1,390 ± 970 ng/kg	2,2',3,4,5,5'-HexaCB (#141)	22,040 ± 3,500 ng/kg
2,4,4'-TriCB (#28)	7,100 ± 1,260 ng/kg	2,2',3,4',5,5'-HexaCB (#146)	39,500 ± 17,000 ng/kg
2,4',5-TriCB (#31)	4,000 ± 71.6 ng/kg	2,2',3,4',5',6-HexaCB (#149)	69,800 ± 24,600 ng/kg
2,4',6-TriCB (#32)	220 ± 216 ng/kg	2,2',3,5,5',6-HexaCB (#151)	24,900 ± 11,100 ng/kg
3,4,4'-TriCB (#37)	165 ± 123 ng/kg	2,2',4,4',5,5'-HexaCB (#153)	226,000 ± 71,200 ng/kg
2,2',3,5'-TetraCB (#44)	14,200 ± 9,660 ng/kg	2,3,3',4,4',5-HexaCB (#156)	13,100 ± 2,620 ng/kg
2,2',4,4'-TetraCB (#47)	16,000 ± 6,560 ng/kg	2,3,3',4,4',5'-HexaCB (#157)	3,380 ± 1,010 ng/kg
2,2',4,5'-TetraCB (#49)	13,600 ± 9,100 ng/kg	2,3,3',4,4',6-HexaCB (#158)	11,600 ± 1,870 ng/kg
2,2',5,5'-TetraCB (#52)	27,100 ± 12,100 ng/kg	2,3',4,4',5,5'-HexaCB (#167)	7,060 ± 3,020 ng/kg
2,3',4,4'-TetraCB (#66)	56,500 ± 20,800 ng/kg	3,3',4,4',5,5'-HexaCB (#169)	52.1 ± 14.0 ng/kg
2,3',4',5-TetraCB (#70)	44,400 ± 3,860 ng/kg	2,2',3,3',4,4',5-HeptaCB	35,100 ± 12,700 ng/kg
2,4,4',5-TetraCB (#74)	23,100 ± 8,440 ng/kg	2,2',3,3',4,5,5'-HeptaCB (#172)	8,450 ± 1,600 ng/kg
3,3',4,4'-TetraCB (#77)	1,850 ± 834 ng/kg	2,2',3,3',4',5,6-HeptaCB (#177)	18,800 ± 4,140 ng/kg
3,4,4',5-TetraCB (#81)	161 ± 74.0 ng/kg	2,2',3,3',5,5',6-HeptaCB (#178)	12,100 ± 1,840 ng/kg
2,2',3,4,5'-PentaCB (#87)	38,400 ± 24,000 ng/kg	2,2',3,4,4',5,5'-HeptaCB	108,000 ± 23,600 ng/kg
2,2',3',4,5-PentaCB (#97)	29,800 ± 14,700 ng/kg	2,2',3,4,4',5',6-HeptaCB (#183)	28,300 ± 6,740 ng/kg
2,2',4,4',5-PentaCB (#99)	94,300 ± 25,200 ng/kg	2,2',3,4',5,5',6-HeptaCB	62,900 ± 21,600 ng/kg
2,2',4,5,5'-PentaCB (#101)	82,700 ± 21,400 ng/kg	2,3,3',4,4',5,5'-HeptaCB (#189)	1,440 ± 498 ng/kg
2,3,3',4,4'-PentaCB (#105)	50,100 ± 15,700 ng/kg	2,2',3,3',4,4',5,5'-OctaCB	12,700 ± 3,200 ng/kg
2,3,3',4',6-PentaCB (#110)	84,900 ± 19,100 ng/kg	2,2',3,3',4,4',5,6-OctaCB (#195)	4,620 ± 1,450 ng/kg
2,3,4,4',5-PentaCB (#114)	3,410 ± 1,550 ng/kg	2,2',3,3',4,4',5',6-OctaCB (#196)	7,720 ± 3,240 ng/kg
2,3',4,4',5-PentaCB (#118)	122,000 ± 38,000 ng/kg	2,2',3,3',4,5,6,6'-OctaCB	16,700 ± 2,400 ng/kg
2',3,4,4',5-PentaCB (#123)	3,280 ± 2,020 ng/kg	2,2',3,4,4',5,5',6-OctaCB	13,800 ± 2,360 ng/kg
3,3',4,4',5-PentaCB (#126)	628 ± 242 ng/kg	2,2',3,3',4,4',5,5',6-NonaCB	4,960 ± 768 ng/kg
2,2',3,3',4,4'-HexaCB (#128)	28,200 ± 9,460 ng/kg	2,2',3,3',4,5,5',6,6'-NonaCB	2,370 ± 350 ng/kg
2,2',3,4,4',5-HexaCB (#137)	7,250 ± 2,440 ng/kg	DecaCB (#209)	3,510 ± 982 ng/kg
2,2',3,4,4',5'-HexaCB (#138)	178,000 ± 27,800 ng/kg		

Brominated flame retardants

2,4,4'-TriBDE (#28)6	312 ± 202 ng/kg
2,2',4,4'-TetraBDE (#47)	9,080 ± 2,620 ng/kg
2,2',4,5'-TetraBDE (#49)	524 ± 274 ng/kg
2,3',4,4'-TetraBDE (#66)	262 ± 81.0 ng/kg
2,2',4,4',5-PentaBDE (#99)	2,280 ± 472 ng/kg
2,2',4,4',6-PentaBDE (#100)	1,720 ± 566 ng/kg
2,2',4,4',5,5'-HexaBDE (#153)	2,030 ± 506 ng/kg
2,2',4,4',5,6'-HexaBDE (#154)	2,550 ± 1,000 ng/kg
2,2',3,4,4',5',6-HeptaBDE (#183)	137 ± 47.8 ng/kg
DecaBDE (#209)	545 ± 1,999 ng/kg

Pesticides

Chlordane	33,400 ± 6,300 ng/kg	Lindane (gamma-HCH)	492 ± 216 ng/kg
4,4'-DDE	587,000 ± 140,000 ng/kg	Heptachlor	1,970 ± 1,110 ng/kg
4,4'-DDD	97,600 ± 33,200 ng/kg	Heptachlor Epoxide	8,210 ± 1,560 ng/kg
4,4'-DDT	9,100 ± 2,700 ng/kg	Hexachlorobenzene	18,100 ± 15,300 ng/kg
Dieldrin	54,500 ± 17,300 ng/kg	Mirex	93,700 ± 23,200 ng/kg
Endosulfan I	1,310 ± 722 ng/kg	cis-Nonachlor	27,700 ± 6,400 ng/kg
Endosulfan II	10,100 ± 1,620 ng/kg	trans-Nonachlor	57,700 ± 51,000 ng/kg
Endrin	2,420 ± 434 ng/kg	Oxychlordane	18,100 ± 11,200 ng/kg
alpha-Hexachlorocyclohexane	1,400 ± 1,140 ng/kg	alpha-Chlordane	30,100 ± 19,000 ng/kg
beta-Hexachlorocyclohexane	834 ± 436 ng/kg	gamma-Chlordane	11,500 ± 7,240 ng/kg

Code	Product	Unit
CIL-EDF-2526	Fortified Fish (slurry) - Organic contaminants	10 g

Reference values

Polychlorinated dioxins and furans

2,3,7,8 TCDD	19.8 ± 4.18 ng/kg	1,2,3,7,8-PeCDF	39.0 ± 7.36 ng/kg
Total TCDD	19.0 ± 1.08 ng/kg	2,3,4,7,8-PeCDF	37.8 ± 10.2 ng/kg
1,2,3,7,8-PeCDD	39.9 ± 10.6 ng/kg	Total PeCDF	72.0 ± 14.9 ng/kg
Total PeCDD	38.9 ± 13.7 ng/kg	1,2,3,4,7,8-HxCDF	83.3 ± 23.0 ng/kg
1,2,3,4,7,8-HxCDD	54.9 ± 7.80 ng/kg	1,2,3,6,7,8-HxCDF	62.8 ± 19.6 ng/kg
1,2,3,6,7,8-HxCDD	51.1 ± 19.3 ng/kg	1,2,3,7,8,9-HxCDF	57.3 ± 10.9 ng/kg
1,2,3,7,8,9-HxCDD	52.9 ± 18.1 ng/kg	2,3,4,6,7,8-HxCDF	58.6 ± 14.2 ng/kg
Total HxCDD	149 ± 41.8 ng/kg	Total HxCDF	243 ± 70.8 ng/kg
1,2,3,4,6,7,8-HpCDD	70.7 ± 23.2 ng/kg	1,2,3,4,6,7,8-HpCDF	81.6 ± 13.7 ng/kg
Total HpCDD	66.9 ± 32.2 ng/kg	1,2,3,4,7,8,9-HpCDF	76.7 ± 26.6 ng/kg
OCDD	181 ± 53.4 ng/kg	Total HpCDF	148 ± 23.0 ng/kg
2,3,7,8-TCDF	18.7 ± 5.58 ng/kg	OCDF	185 ± 57.4 ng/kg
Total TCDF	19.0 ± 2.20 ng/kg		

Polychlorinated biphenyls

2,2',5-TriCB (#18)	100 ± 49.0 ng/kg	2',3,4,4',5-PentaCB (#123)	7.38 ± 9.58 ng/kg
2,4,4'-TriCB (#28)	245 ± 268 ng/kg	3,3',4,4',5-PentaCB (#126)	431 ± 17.9 ng/kg
2,2',5,5'-TetraCB (#52)	369 ± 124 ng/kg	2,2',3,4,4',5'-HexaCB (#138)	395 ± 184 ng/kg
3,3',4,4'-TetraCB (#77)	451 ± 179 ng/kg	2,2',3,5,5',6-HexaCB (#151)	99.8 ± 17.1 ng/kg
3,4,4',5-TetraCB (#81)	3.00 ± 5.60 ng/kg	2,2',4,4',5,5'-HexaCB (#153)	490 ± 334 ng/kg
2,2',4,4',5-PentaCB (#99)	215 ± 204 ng/kg	2,3,3',4,4',5-HexaCB (#156)	23.3 ± 23.8 ng/kg
2,2',4,5,5'-PentaCB (#101)	579 ± 362 ng/kg	2,3,3',4,4',5'-HexaCB (#157)	9.30 ± 9.16 ng/kg
2,3,3',4,4'-PentaCB (#105)	108 ± 73.0 ng/kg	2,3',4,4',5,5'-HexaCB (#167)	12.0 ± 9.54 ng/kg
2,3,3',4',6-PentaCB (#110)	288 ± 112 ng/kg	3,3',4,4',5,5'-HexaCB (#169)	512 ± 160 ng/kg
2,3,4,4',5-PentaCB (#114)	7.73 ± 4.36 ng/kg	2,2',3,4,4',5,5'-HeptaCB (#180)	116 ± 64.4 ng/kg
2,3',4,4',5-PentaCB (#118)	348 ± 392 ng/kg	2,3,3',4,4',5,5'-HeptaCB (#189)	3.51 ± 2.76 ng/kg

Polybrominated diphenyl ethers

2,2',4,4',5,5'-HexaBDE (#153)	7.48 ± 14.7 ng/kg

CIL-EDF-4023	Set of three fish reference materials	3 x 10 g

Clean Natural Matrix	CIL-EDF-2524
Contaminated Natural Matrix	CIL-EDF-2525
Fortified Natural Matrix	CIL-EDF-2526

Code	Product	Unit
CIL-EDF-5462	Fortified cod liver oil - PCDDs, PCDFs, PCBs, PBDEs	10 g

CIL- EDF-5462 is a commercially available Cod Liver Oil Reference Material and has been spiked with known amounts of dioxins, furans, and polychlorinated biphenyls. This sample is meant to be used to evaluate the performance of an analytical laboratory for the analytes given

All values are in ng/kg

Analyte	Assigned Value[1]	Standard Deviation	Reference Value[2]	Target Value[3]	(n)[4]
Polychlorinated dioxins & furans					
2,3,7,8-TetraCDD	16.1	1.72	16.1 ± 3.44	17.5	11
Total TetraCDD	15.8	2.10	15.8 ± 4.20		7
2,3,7,8-TetraCDF	1430	140	1430 ± 280	1520	10
Total TetraCDF	1490	135	1490 ± 270		6
1,2,3,7,8-PentaCDD	39.3	2.37	39.3 ± 4.74	43.8	11
Total PentaCDD	39.0	2.80	39.0 ± 5.60		7
1,2,3,7,8-PentaCDF	387	30.4	387 ± 60.8	394	10
2,3,4,7,8-PentaCDF	40.2	3.22	40.2 ± 6.44	38.2	10
Total PentaCDF	435	33.0	435 ± 66.0		7
1,2,3,4,7,8-HexaCDD	39.1	4.88	39.1 ± 9.76	43.8	10
1,2,3,6,7,8-HexaCDD	39.2	3.92	39.2 ± 7.84	43.8	10
1,2,3,7,8,9-HexaCDD	41.1	4.63	41.1 ± 9.26	43.8	9
Total HexaCDD	122	23.3	122 ± 46.6		7
1,2,3,4,7,8-HexaCDF	39.5	2.69	39.5 ± 5.38	43.8	10
1,2,3,6,7,8-HexaCDF	40.9	2.42	40.9 ± 4.84	43.8	10
1,2,3,7,8,9-HexaCDF	39.6	4.15	39.6 ± 8.30	43.8	10
2,3,4,6,7,8-HexaCDF	39.2	3.01	39.2 ± 6.02	43.8	10
Total HexaCDF	157	12.2	157 ± 24.4		7
1,2,3,4,6,7,8-HeptaCDD	40.6	3.25	40.6 ± 6.50	43.8	10
Total HeptaCDD	40.3	3.57	40.3 ± 7.14		7
1,2,3,4,6,7,8-HeptaCDF	41.0	4.58	41.0 ± 9.16	43.8	10
1,2,3,4,7,8,9-HeptaCDF	41.0	3.84	41.0 ± 7.68	43.8	10
Total HeptaCDF	81.0	9.61	81.0 ± 19.2		7
OctaCDD	115	7.66	115 ± 15.3	128	10
OctaCDF	75.4	10.3	75.4 ± 20.6	87.5	10
Polychlorinated biphenyls[5]					
2,2',5-TriCB (#18)	56.7	18.4	56.7 ± 36.8	40.0	7
2,4,4'-TriCB (#28)	450	98.0	450 ± 196	340	9
3,4,4'-TriCB (#37)	56.7	21.5	56.7 ± 43.0	40.0	6
2,2',3,5'-TetraCB (#44)	100	14.0	100 ± 28.0	40.0	5
2,2',4,5'-TetraCB (#49)	101	15.8	101 ± 31.6	40.0	6
2,2',5,5'-TetraCB (#52)	533	112	533 ± 224	340	8
2,3',4,4'-TetraCB (#66)	211	25.7	211 ± 51.4	40.0	5
2,4,4',5-TetraCB (#74)	142	33.7	142 ± 67.4	80.0	6
3,3',4,4'-TetraCB (#77)	50.7	8.03	50.7 ± 16.1	40.0	10
3,4,4',5-TetraCB (#81)	40.7	4.84	40.7 ± 9.68	40.0	10
2,2',4,4',5-PentaCB (#99)	519	62.9	519 ± 126	40.0	8
2,2',4,5,5'-PentaCB (#101)	1020	138	1020 ± 276	340	8
2,3,3',4,4'-PentaCB (#105)	769	76.9	769 ± 154	40.0	12
2,3,3',4',6-PentaCB (#110)	599	81.4	599 ± 163	40.0	8
2,3,4,4',5-PentaCB (#114)	75.4	8.21	75.4 ± 16.4	40.0	11
2,3',4,4',5-PentaCB (#118)	1670	133	1670 ± 266	40.0	11
2',3,4,4',5-PentaCB (#123)	58.2	9.64	58.2 ± 19.3	40.0	10
3,3',4,4',5-PentaCB (#126)	53.3	3.79	53.3 ± 7.58	40.0	10
2,2',3,3',4,4'-HexaCB (#128)	812	255	812 ± 510		9
2,2',3,4,4',5-HexaCB (#137)	143	23.0	143 ± 46.0		5
2,2',3,4,4',5'-HexaCB (#138)	4190	793	4190 ± 1590	340	10
2,2',3,4,5,5'-HexaCB (#141)	256	40.6	256 ± 81.2		6
2,2',3,4',5',6-HexaCB (#149)	819	242	819 ± 484	40.0	7
2,2',3,5,5',6-HexaCB (#151)	231	69.7	231 ± 139		7
2,2',4,4',5,5'-HexaCB (#153)	4240	333	4240 ± 666	340	11
2,3,3',4,4',5-HexaCB (#156)	501	66.9	501 ± 134	80.0	12
2,3,3',4,4',5'-HexaCB (#157)	168	14.8	168 ± 29.6	80.0	10
2,3,3',4,4',6-HexaCB (#158)	274	17.8	274 ± 35.6		5
2,3',4,4',5,5'-HexaCB (#167)	271	27.2	271 ± 54.4	40.0	10
3,3',4,4',5,5'-HexaCB (#169)	44.1	4.79	44.1 ± 9.58	40.0	11
2,2',3,3',4,4',5-HeptaCB (#170)	956	84.8	956 ± 170	40.0	10
2,2',3,3',4',5,6-HeptaCB (#177)	207	22.7	207 ± 45.4		7
2,2',3,3',5,5',6-HeptaCB (#178)	194	25.2	194 ± 50.4	40.0	6
2,2',3,4,4',5,5'-HeptaCB (#180)	2510	203	2510 ± 406	340	11
2,2',3,4,4',5',6-HeptaCB (#183)	338	36.4	338 ± 72.8		9
2,2',3,4',5,5',6-HeptaCB (#187)	859	86.9	859 ± 174	40.0	9
2,3,3',4,4',5,5'-HeptaCB (#189)	93.2	8.31	93.2 ± 16.6	40.0	11
2,2',3,3',4,4',5,5'-OctaCB (#194)	302	57.9	302 ± 116	40.0	7
2,2',3,3',4,4',5,5',6-NonaCB(#206)	130	30.7	130 ± 61.4	40.0	7
2,2',3,3',4,5,5',6,6'-NonaCB(#208)	72.1	11.4	72.1 ± 22.8	40.0	6
DecaCB (#209)	488	82.0	488 ± 164	340	7
Brominated diphenyl ethers[5]					
2,2',4-TriBDE (#17)	8.83	2.88	8.83 ± 5.76		7
2,4,4'-TriBDE (#28)	40.1	6.95	40.1 ± 13.9		6
2,2',4,4'-TetraBDE (#47)	1480	240	1480 ± 480		8
2,3',4,4'-TetraBDE (#66)	48.4	14.7	48.4 ± 29.4		6
2,2',4,4',5-PentaBDE (#99)	193	35.2	193 ± 70.4		7
2,2',4,4',6-PentaBDE (#100)	357	25.3	357 ± 50.6		7
2,2',4,4',5,5'-HexaBDE (#153)	33.9	3.32	33.9 ± 6.64		7
2,2',4,4',5,6'-HexaBDE (#154)	229	44.4	229 ± 88.8		7

[1] Assigned value as determined by TRIUM Inc. (Canada) using STATISTICA data analysis software analysis of raw interlaboratory study data.
[2] Reference value is the Assigned Value plus or minus two standard deviations. Negative numbers resulting from two standard deviations being greater than the assigned value have no significance.
[3] Target value is the value provided by TestAmerica, Inc. that was used to spike the Cod liver oil sample. This value is independent of and may be in addition to analytes present in blank.
[4] Number of laboratories providing results for this analyte.
[5] All numbers in parentheses refer to the IUPAC designation for the compound.

Code	Product	Unit

CIL-EDF-5463 — Cod liver oil - PCBs, PBDEs — 10 g

CIL-EDF-5463 is a Cod Liver Oil Reference Material purchased from TestAmerica Corporation in Knoxville, TN. The pure Norwegian cod liver oil is commercially available. This sample is meant to be used to evaluate the performance of an analytical laboratory for the analytes given.

All values are in ng/kg

Analyte	Assigned Value[1]	Standard Deviation	Reference Value[2]	(n)[3]
Polychlorinated biphenyls[4]				
2,4,4'-TriCB (#28)	50.4	11.6	50.4 ± 23.2	6
2,2',3,5'-TetraCB (#44)	60.7	10.7	60.7 ± 21.4	5
2,2',5,5'-TetraCB (#52)	153	36.2	153 ± 72.4	8
2,3',4,4'-TetraCB (#66)	171	21.5	171 ± 43.0	5
2,4,4',5-TetraCB (#74)	102	17.3	102 ± 34.6	6
3,3',4,4'-TetraCB (#77)	9.61	1.87	9.61 ± 3.74	8
2,2',4,4',5-PentaCB (#99)	474	59.0	474 ± 118	8
2,2',4,5,5'-PentaCB (#101)	661	97.4	661 ± 195	8
2,3,3',4,4'-PentaCB (#105)	732	69.5	732 ± 139	11
2,3,3',4',6-PentaCB (#110)	567	89.7	567 ± 179	9
2,3,4,4',5-PentaCB (#114)	34.5	7.74	34.5 ± 15.5	10
2,3',4,4',5-PentaCB (#118)	1590	148	1590 ± 296	11
2',3,4,4',5-PentaCB (#123)	22.8	7.15	22.8 ± 14.3	9
3,3',4,4',5-PentaCB (#126)	15.2	4.13	15.2 ± 8.26	10
2,2',3,3',4,4'-HexaCB (#128)	767	223	767 ± 446	9
2,2',3,4,4',5-HexaCB (#137)	134	17.7	134 ± 35.4	5
2,2',3,4,4',5'-HexaCB (#138)	3810	638	3810 ± 1280	10
2,2',3,4,5,5'-HexaCB (#141)	253	34.4	253 ± 68.8	6
2,2',3,4',5',6-HexaCB (#149)	762	237	762 ± 474	7
2,2',3,5,5',6-HexaCB (#151)	235	73.0	235 ± 146	7
2,2',4,4',5,5'-HexaCB (#153)	3890	450	3890 ± 900	11
2,3,3',4,4',5-HexaCB (#156)	456	69.2	456 ± 138	12
2,3,3',4,4',5'-HexaCB (#157)	124	11.6	124 ± 23.2	10
2,3,3',4,4',6-HexaCB (#158)	272	36.7	272 ± 73.4	5
2,3',4,4',5,5'-HexaCB (#167)	234	26.5	234 ± 53.0	10
3,3',4,4',5,5'-HexaCB (#169)	4.39	0.579	4.39 ± 1.16	7
2,2',3,3',4,4',5-HeptaCB (#170)	917	85.9	917 ± 172	10
2,2',3,3',4',5,6-HeptaCB (#177)	217	25.5	217 ± 51.0	7
2,2',3,3',5,5',6-HeptaCB (#178)	151	19.2	151 ± 38.4	6
2,2',3,4,4',5,5'-HeptaCB (#180)	2160	182	2160 ± 364	11
2,2',3,4,4',5',6-HeptaCB (#183)	341	38.1	341 ± 76.2	9
2,2',3,4',5,5',6-HeptaCB (#187)	839	105	839 ± 210	9
2,3,3',4,4',5,5'-HeptaCB (#189)	53.4	7.25	53.4 ± 14.5	11
2,2',3,3',4,4',5,5'-OctaCB (#194)	296	32.9	296 ± 65.8	7
2,2',3,3',4,4',5,5',6-NonaCB (#206)	95.1	18.1	95.1 ± 36.2	7
2,2',3,3',4,5,5',6,6'-NonaCB (#208)	28.1	6.46	28.1 ± 12.9	5
DecaCB (#209)	96.2	12.8	96.2 ± 25.6	6
Brominated diphenyl ethers[4]				
2,2',4-TriBDE (#17)	7.21	1.09	7.21 ± 2.18	6
2,4,4'-TriBDE (#28)	39.7	5.28	39.7 ± 10.6	6
2,2',4,4'-TetraBDE (#47)	1490	237	1490 ± 474	9
2,3',4,4'-TetraBDE (#66)	52.6	17.5	52.6 ± 35.0	6
2,2',4,4',5-PentaBDE (#99)	187	24.3	187 ± 48.6	7
2,2',4,4',6-PentaBDE (#100)	359	31.6	359 ± 63.2	7
2,2',4,4',5,5'-HexaBDE (#153)	33.9	5.09	33.9 ± 10.2	7
2,2',4,4',5,6'-HexaBDE (#154)	238	29.6	238 ± 59.2	7

[1] Assigned value as determined by TRIUM Inc. (Canada) using STATISTICA data analysis software analysis of raw interlaboratory study data.
[2] Reference value is the Assigned Value plus or minus two standard deviations. Negative numbers resulting from two standard deviations being greater than the assigned value have no significance.
[3] Number of laboratories providing results for this analyte.
[4] All numbers in parentheses refer to the IUPAC designation for the compound.

ERM-BB350 — Salmon oil - PCBs — 2 g

Compound	Certified value ng/g	Uncertainty ng/kg
2,4,4'-Trichlorobiphenyl (PCB 28)	21.3	1.1
2,2',5,5'-Tetrachlorobiphenyl (PCB 52)	37.4	2.2
2,4,4',5-Tetrachlorobiphenyl (PCB 74)	23	1.9
2,2',4,4',5-Pentachlorobiphenyl (PCB 99)	62	6
2,2',4,5,5'-Pentachlorobiphenyl (PCB 101)	111	5
2,3,3',4,4'-Pentachlorobiphenyl (PCB 105)	25.8	2.1
2,3,3',4',6-Pentachlorobiphenyl (PCB 110)	54.1	2.8
2,3',4,4',5-Pentachlorobiphenyl (PCB 118)	84	4
2,2',3,4,4',5'-Hexachlorobiphenyl (PCB 138)	137	10
2,2',3,4',5',6-Hexachlorobiphenyl (PCB 149)	88	9
2,2',4,4',5,5'-Hexachlorobiphenyl (PCB 153)	220	11
2,3,3',4,4',5-Hexachlorobiphenyl (PCB 156)	20.1	1.3
2,2',3,3',4,5',6'-Heptachlorobiphenyl (PCB 177)	25.8	2
2,2',3,4,4',5,5'-Heptachlorobiphenyl (PCB 180)	67	4
2,2',3,4,4',5',6-Heptachlorobiphenyl (PCB 183)	22.5	1.8
2,2',3,4',5,5',6-Heptachlorobiphenyl (PCB 187)	67	5
2,2',3,3',4,4',5,5'-Octachlorobiphenyl (PCB 194)	23.4	1.5
2,2',3,3',4,4',5,6'-Octachlorobiphenyl (PCB 196)	41	7

Code	Product	Unit

ERM-BB422 — Fish muscle - Trace elements — 10 g

Certified values

As	12.7 mg/kg	I	1.4 mg/kg
Cd	0.0075 mg/kg	Mn	0.368 mg/kg
Cu	1.67 mg/kg	Se	1.33 mg/kg
Fe	9.4 mg/kg	Zn	16.0 mg/kg
Hg	0.601 mg/kg		

ERM-CE278K — Mussel tissue - Trace elements — 8 g

Certified values

As	6.7 mg/kg	Ni	0.69 mg/kg
Cd	0.336 mg/kg	Pb	2.18 mg/kg
Cr	0.73 mg/kg	Rb	2.46 mg/kg
Cu	5.98 mg/kg	Se	1.62 mg/kg
Fe	161 mg/kg	Sr	19.0 mg/kg
Hg	0.071 mg/kg	Zn	71 mg/kg
Mn	4.88 mg/kg		

ERM-CE464 — Tuna fish - Total mercury and methyl mercury — 15 g

Certified values

Methylmercury	5.50 mg/kg
Total mercury	5.24 mg/kg

ERM-CE477 — Mussel tissue - Butyltin compounds — 14 g

Compound	Certified value mg/kg	Uncertainty mg/kg
Tributyltin (TBT)	2.20	0.19
Dibutyltin (DBT)	1.54	0.12
Monobutyltin (MBT)	1.50	0.28

LGC7164 — Crab paste - Proximates and Elements — 140 g

LGC Certified Reference Material LGC7164 is a brown crab meat paste. This material is sealed in cans in 140g portions.

Certified values

Moisture	59.26 g/100 g	Lead	0.0697 mg/kg
Nitrogen	3.541 g/100 g	Magnesium	43.1 mg/100 g
Total fat	12.13 g/100 g	Manganese	3.28 mg/kg
Ash	2.855 g/100 g	Phosphorus	564 mg/100 g
Chloride	0.78 g/100 g	Potassium	564 mg/100 g
Calcium	348 mg/100 g	Sodium	463 mg/100 g
Cadmium	9.20 mg/kg	Zinc	56.8 mg/kg
Copper	20.1 mg/kg		

Assessed values

Arsenic	13.8 mg/kg	Iron	3.17 mg/kg
Cobalt	0.131 mg/kg		

Indicative values

Aluminium	1-4 mg/kg	Nickel	0.1-1.1 mg/kg
Chromium	0.1-1.0 mg/kg	Selenium	1.4-4.0 mg/kg
Mercury	0.08-0.11 mg/kg	Tin	0.01-0.15 mg/kg

NIST-1566b — Oyster Tissue - Trace elements and methyl mercury — 25 g

This Standard Reference Material® (SRM®) is intended primarily for use in evaluating analytical methods and instruments used for the determination of the concentrations of selected elements and proximates, selected fatty acids, total dietary fibre, as well as the calorific content in marine bivalve tissue, foods, or similar materials. A unit of NIST-1566b contains approximately 25 g of freeze-dried oyster tissue.

Certified values

Ca	0.0838 ± 0.0020 %	Pb	0.308 ± 0.009 mg/kg
Cl	0.514 ± 0.010 %	Mn	18.5 ± 0.2 mg/kg
Mg	0.1085 ± 0.0023 %	Hg (total)	0.0371 ± 0.0013 mg/kg
K	0.652 ± 0.009 %	Methylmercury (as Hg)	0.0132 ± 0.0007 mg/kg
Na	0.3297 ± 0.0053 %	Ni	1.04 ± 0.09 mg/kg
S	0.6887 ± 0.0140 %	Rb	3.262 ± 0.145 mg/kg
Al	197.2 ± 6.0 mg/kg	Se	2.06 ± 0.15 mg/kg
As	7.65 ± 0.65 mg/kg	Ag	0.666 ± 0.009 mg/kg
Cd	2.48 ± 0.08 mg/kg	Th	0.0367 ± 0.0043 mg/kg
Co	0.371 ± 0.009 mg/kg	V	0.577 ± 0.023 mg/kg
Cu	71.6 ± 1.6 mg/kg	Zn	1 424 ± 46 mg/kg
Fe	205.8 ± 6.8 mg/kg		

Indicative values for proximates, nitrogen, total dietary fiber, selected fatty acids (as triglycerides) and calories

Code	Product	Unit
NIST-1947	Lake Michigan fish tissue - Organic contaminants	5 x 8 g

This Standard Reference Material® (SRM®) 1947 is a frozen fish tissue homogenate, which was prepared from fish collected from Lake Michigan, and is intended primarily for use in evaluating analytical methods for the determination of selected trace elements, methylmercury, total mercury, polychlorinated biphenyl (PCB) congeners, chlorinated pesticides, and polybrominated diphenyl ether (PBDE) congeners, proximates, caloric content and fatty acids in fish tissue and similar matrices. All of the constituents for which certified, reference, and information values are provided are naturally present in the fish tissue homogenate. A unit of NIST-1947 consists of five bottles, each containing approximately 8 g (wet basis) of frozen tissue homogenate.

Certified concentrations for selected elements and methylmercury

	Element Mass Fraction mg/kg (wet-mass basis)		Element Mass Fraction mg/kg (wet-mass basis)
As	0.732 ± 0.039	Rb	4.51 ± 0.09
Cu	0.411 ± 0.029	Se	0.475 ± 0.084
Fe	3.79 ± 0.42	Zn	2.66 ± 0.08
Hg	0.254 ± 0.005	Methylmercury	0.233 ± 0.010
Mn	0.076 ± 0.004		

Certified concentrations for selected PCB congeners

		Mass fraction µg/kg (dry mass basis)
PCB 28	2,4,4'-Trichlorobiphenyl	14.1 ± 1.0
PCB 31	2,4',5-Trichlorobiphenyl	10.4 ± 1.4
PCB 44	2,2',3,5'-Tetrachlorobiphenyl	20.4 ± 1.7
PCB 49	2,2',4,5'-Tetrachlorobiphenyl	27.3 ± 3.8
PCB 52	2,2',5,5'-Tetrachlorobiphenyl	36.4 ± 4.3
PCB 63	2,3,4',5-Tetrachlorobiphenyl	4.75 ± 0.60
PCB 66	2,3',4,4'-Tetrachlorobiphenyl	69.4 ± 5.3
PCB 74	2,4,4',5-Tetrachlorobiphenyl	33.7 ± 3.1
PCB 87	2,2',3,4,5'-Pentachlorobiphenyl	27.9 ± 1.5
PCB 99	2,2',4,4',5-Pentachlorobiphenyl	78.0 ± 6.0
PCB 101	2,2',4,5,5'-Pentachlorobiphenyl	90.8 ± 0.3
PCB 105	2,3,3',4,4'-Pentachlorobiphenyl	50.3 ± 3.7
PCB 107	2,3,3',4',5-Pentachlorobiphenyl	17.1 ± 1.2
PCB 110	2,3,3',4',6-Pentachlorobiphenyl	94.6 ± 4.3
PCB 118	2,3',4,4',5-Pentachlorobiphenyl	112 ± 6
PCB 128	2,2',3,3',4,4'-Hexachlorobiphenyl	31.6 ± 2.1
PCB 132	2,2',3,3',4,6'-Hexachlorobiphenyl	20.8 ± 2.1
PCB 138	2,2',3,4,4',5'-Hexachlorobiphenyl	162.0 ± 6.9
PCB 146	2,2',3,4',5,5'-Hexachlorobiphenyl	40.5 ± 2.0
PCB 149	2,2',3,4',5',6-Hexachlorobiphenyl	67.1 ± 3.7
PCB 153	2,2',4,4',5,5'-Hexachlorobiphenyl	201 ± 3
PCB 156	2,3,3',4,4',5-Hexachlorobiphenyl	13.3 ± 0.9
PCB 158	2,3,3',4,4',6-Hexachlorobiphenyl	11.3 ± 0.9
PCB 170	2,2',3,3',4,4',5-Heptachlorobiphenyl	29.2 ± 2.4
PCB 174	2,2',3,3',4,5,6'-Heptachlorobiphenyl	18.6 ± 1.7
PCB 180	2,2',3,4,4',5,5'-Heptachlorobiphenyl	80.8 ± 5.0
PCB 183	2,2',3,4,4',5',6-Heptachlorobiphenyl	23.3 ± 1.9
PCB 187	2,2',3,4',5,5',6-Heptachlorobiphenyl	54.8 ± 2.6
PCB 193	2,3',3,4',5,5',6-Heptachlorobiphenyl	6.04 ± 0.23
PCB 194	2,2',3,3',4,4',5,5'-Octachlorobiphenyl	13.2 ± 0.9
PCB 195	2,2',3,3',4,4',5,6-Octachlorobiphenyl	4.95 ± 0.77
PCB 206	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	6.24 ± 0.8

Certified concentrations for selected chlorinated pesticides

	Mass fraction µg/kg (wet- mass basis)		Mass fraction µg/kg (wet- mass basis)
Hexachlorobenzene	7.48 ± 0.66	Mirex	5.09 ± 0.73
α-HCH	1.06 ± 0.12	2,4'-DDE	3.39 ± 0.28
Heptachlor epoxide	13.4 ± 0.8	4,4'-DDE	720 ± 43
Oxychlordane	23.6 ± 1.5	2,4'-DDD	3.31 ± 0.16
trans-Chlordane	12.8 ± 1.2	4,4'-DDD	45.9 ± 3.6
cis-Nonachlor	54.1 ± 7.3	2,4'-DDT	15.7 ± 0.89
trans-Nonachlor	127 ± 6	4,4'-DDT	59.5 ± 6.7
Dieldrin	80.8 ± 3.8		

Certified concentrations for fat and selected polybrominated diphenyl ether (PBDE)

		Mass fraction µg/kg (wet- mass basis)
BDE 47	2,2',4,4'-Tetrabromodiphenylether	73.3 ± 2.9
BDE 49	2,2',4,5'-Tetrabromodiphenylether	4.01 ± 0.10
BDE 66	2,3',4,4'-Tetrabromodiphenylether	1.85 ± 0.13
BDE 99	2,2',4,4',5-Pentabromodiphenylether	19.2 ± 0.8
BDE 100	2,2',4,4',6-Pentabromodiphenylether	17.1 ± 0.6
BDE 153	2,2',4,4',5,5'-Hexabromodiphenylether	3.83 ± 0.04
BDE 154	2,2',4,4',5,6'-Hexabromodiphenylether	6.88 ± 0.52

Reference concentrations for PCBs, pesticides, PBDE congeners, pesticides, proximates and caloric content, fat and fatty acids.

Code	Product	Unit
NIST-1974C	Mussel tissue (frozen) - PAHs, PCBs, Chlorinated Pesticides, PBDEs	5 x 10 g

Standard Reference Material NIST-1974c is a frozen mussel tissue homogenate intended for use in evaluating analytical methods for the determination of selected polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyl (PCB) congeners, and chlorinated pesticides in marine bivalve mollusk tissue and similar matrices. All of the constituents for which certified and reference values are provided in NIST-1974c were naturally present in the tissue material before processing.

Certified concentrations for selected PAHs in NIST-1974c

	Mass Fractions in µg/kg	
	Wet-Mass Basis	Dry-Mass Basis
Fluorene	2.31 ± 0.04	22.6 ± 0.4
Dibenzothiophene	1.53 ± 0.02	15.0 ± 0.2
Phenanthrene	19.6 ± 0.4	191 ± 4
Anthracene	1.17 ± 0.08	11.4 ± 0.8
1-Methylphenanthrene	3.07 ± 0.11	30.0 ± 1.1
2-Methylphenathrene	4.56 ± 0.04	44.5 ± 0.5
3-Methylphenanthrene	4.09 ± 0.03	39.9 ± 0.4
9-Methylphenanthrene	2.46 ± 0.02	24.0 ± 0.3
2-Methylanthracene	0.951 ± 0.007	9.2 ± 0.1
Fluoranthene	45.3 ± 0.8	442 ± 9
Pyrene	23.9 ± 1.6	233 ± 15
Benzo[ghi]fluoranthene	3.03 ± 0.09	29.5 ± 0.9
Benzo[c]phenanthrene	1.99 ± 0.04	19.4 ± 0.4
Benz[a]anthracene	5.69 ± 0.11	55.5 ±1.1
Benzo[k]fluoranthene	2.75 ± 0.02	26.8 ± 0.3
Benzo[a]fluoranthene	0.543 ± 0.006	5.30 ± 0.07
Benzo[e]pyrene	7.33 ± 0.05	71.6 ± 0.7
Benzo[a]pyrene	2.32 ± 0.03	22.6 ± 0.3
Perylene	0.560 ± 0.022	5.46 ± 0.22
Benzo[ghi]perylene	2.82 ± 0.05	27.6 ± 0.5
Benzo[b]chrysene	0.694 ± 0.013	6.77 ± 0.13
Picene	1.36 ± 1.6	13.2 ± 0.8

Certified concentrations for selected PCB congeners in NIST-1974c

		Mass Fractions in µg/kg	
		Wet-Mass Basis	Dry-Mass Basis
PCB 8	2,4‘- Dichlorobiphenyl	0.191 ± 0.003	1.86 ± 0.03
PCB 18	2,2',5-Trichlorobiphenyl	0.589 ± 0.007	5.75 ± 0.08
PCB 28	2,4,4'-Trichlorobiphenyl	1.47 ± 0.02	14.4 ± 0.2
PCB 31	2,4',5-Trichlorobiphenyl	1.16 ± 0.06	11.3 ± 0.6
PCB 44	2,2'3,5'-Tetrachlorobiphenyl	1.54 ± 0.08	15.1 ± 0.8
PCB 45	2,2'3,6-Tetrachlorobiphenyl	0.214 ± 0.019	2.09 ± 0.18
PCB 49	2,2'4,5'-Tetrachlorobiphenyl	1.76 ± 0.02	17.1 ± 0.2
PCB 52	2,2',5,5'-Tetrachlorobiphenyl	2.49 ± 0.06	24.3 ± 0.6
PCB 56	2,3,3‘,4‘-Tetrachlorobiphenyl	0.663 ± 0.008	6.46 ± 0.09
PCB 63	2,3,4‘,5-Tetrachlorobiphenyl	0.137 ± 0.013	1.34 ± 0.13
PCB 66	2,3',4,4'-Tetrachlorobiphenyl	1.65 ± 0.02	16.1 ± 0.2
PCB 70	2,3',4',5-Tetrachlorobiphenyl	1.57 ± 0.05	15.3 ± 0.5
PCB 74	2,4,4',5-Tetrachlorobiphenyl	0.850 ± 0.011	8.29 ± 0.12
PCB 82	2,2',3,3',4-Pentachlorobiphenyl	0.507 ± 0.008	4.95 ± 0.09
PCB 87	2,2',3,4,5'-Pentachlorobiphenyl	2.08 ± 0.02	20.3 ± 0.2
PCB 92	2,2',3,5,5‘-Pentachlorobiphenyl	1.06 ± 0.02	10.4 ± 0.2
PCB 95	2,2',3,5‘,6-Pentachlorobiphenyl	1.82 ± 0.02	17.8 ± 0.2
PCB 99	2,2',4,4',5-Pentachlorobiphenyl	3.55 ± 0.05	34.7 ± 0.6
PCB 101	2,2',4,5,5'-Pentachlorobiphenyl	6.67 ± 0.05	65.1 ± 0.7
PCB 105	2,3,3',4,4'-Pentachlorobiphenyl	1.57 ± 0.03	15.3 ± 0.3
PCB 110	2,3,3',4',6-Pentachlorobiphenyl	5.47 ± 0.06	53.4 ± 0.7
PCB 118	2,3',4,4',5-Pentachlorobiphenyl	4.08 ± 0.09	39.8 ± 0.9
PCB 128	2,2',3,3',4,4'-Hexachlorobiphenyl	0.801 ± 0.011	7.81 ± 0.11
PCB 138	2,2',3,4,4',5'-Hexachlorobiphenyl	4.39 ± 0.04	42.9 ± 0.5
PCB 146	2,2',3,4',5,5'-Hexachlorobiphenyl	0.904 ± 0.005	8.82 ± 0.09
PCB 149	2,2',3,4',5',6-Hexachlorobiphenyl	3.97 ± 0.04	39.8 ± 0.5
PCB 151	2,2',3,5,5',6-Hexachlorobiphenyl	1.13 ± 0.03	11.0 ± 0.3
PCB 153	2,2',4,4',5,5'-Hexachlorobiphenyl	6.76 ± 0.12	66.0 ± 1.3
PCB 156	2,3,3',4,4',5-Hexachlorobiphenyl	0.253 ± 0.005	2.47 ± 0.05
PCB 158	2,3,3',4,4',6-Hexachlorobiphenyl	0.443 ± 0.003	4.33 ± 0.04
PCB 163	2,3,3',4‘,5,6-Hexachlorobiphenyl	1.10 ± 0.09	10.8 ± 0.9
PCB 170	2,2',3,3',4,4',5-Heptachlorobiphenyl	0.105 ± 0.009	1.03 ± 0.09
PCB 177	2,2‘3,3',4‘5,6- Heptachlorobiphenyl	0.696 ± 0.011	6.79 ± 0.12
PCB 178	2,2‘,3,3',5,5‘,6 - Heptachlorobiphenyl	0.350 ± 0.011	3.42 ± 0.04
PCB 180	2,2',3,4,4',5,5'-Heptachlorobiphenyl	0.594 ± 0.008	5.79 ± 0.09
PCB 183	2,2',3,4,4',5',6-Heptachlorobiphenyl	0.848 ± 0.006	8.27 ± 0.09
PCB 187	2,2',3,4',5,5',6-Heptachlorobiphenyl	2.09 ± 0.05	20.4 ± 0.5

Code	Product	Unit
NIST-2974A	Mussel tissue - Organics	5 g

This Standard Reference Material® (SRM®) is intended for use in evaluating analytical methods for the determination of selected polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyl (PCB) congeners, chlorinated pesticides, polybrominated diphenyl ether (PBDE) congeners, hexabromocyclododecane (HBCD) isomers, methylmercury, inorganic mercury, and total mercury in marine bivalve mollusk tissue and similar matrices. All of the constituents for which certified and reference values are provided are naturally present in the freeze-dried mussel tissue. A unit of NIST-2974A consists of one bottle containing approximately 5 g of freeze-dried mussel tissue.

Certified Concentration Values for Selected PAHs in NIST-2974A

	Mass Fraction µg/kg (dry-mass basis)		Mass Fraction µg/kg (dry-mass basis)
Phenanthrene	74.4 ±4.7	Benzo[c]phenanthrene	23.2 ± 1.9
1-Methylphenanthrene	17.6 ± 1.6	Benz[a]anthracene	31.1 ± 3.9
2-Methylphenanthrene	28.2 ± 2.6	Chrysene and Triphenylene	123.6 ± 2.9
3-Methylphenanthrene	24.1 ± 1.4	Benzo[b]fluoranthene	41.5 ± 2.6
9-Methylphenanthrene	15.9 ± 1.3	Benzo[j]fluoranthene	21.4 ± 1.1
4-H-Cyclopenta[def]phenanthrene	13.15 ± 0.71	Benzo[k]fluoranthene	18.95 ± 0.54
Fluoranthene	287 ± 34	Benzo[e]pyrene	58.9 ± 2.9
Pyrene	166 ± 21	Benzo[a]pyrene	9.73 ± 0.43
1-Methylpyrene	10.69 ± 0.83	Perylene	6.80 ± 0.34
4-Methylpyrene	19.77 ± 0.89	Benzo[ghi]perylene	23.7 ± 2.2
Benzo[ghi]fluoranthene	18.7 ± 1.7		

Certified Concentration Values for Selected PCB Congeners in NIST-2974A

	Mass Fraction µg/kg (dry-mass basis)		Mass Fraction µg/kg (dry-mass basis)
PCB 8	2.01 ± 0.08	PCB 118	42.9 ± 2.1
PCB 18	4.03 ± 0.22	PCB 128	8.24 ± 0.33
PCB 44	16.24 ± 0.71	PCB 138	61.5 ± 2.3
PCB 49	17.1 ± 1.2	PCB 146	8.07 ± 0.40
PCB 52	22.42 ± 0.92	PCB 149	31.77 ± 0.95
PCB 66	20.6 ± 1.1	PCB 151	5.99 ± 0.20
PCB 70	15.45 ± 0.64	PCB 153	78.8 ± 2.5
PCB 74	9.02 ± 0.37	PCB 156	5.80 ± 0.25
PCB 87	14.36 ± 0.56	PCB 170	2.04 ± 0.08
PCB 95	23.72 ± 0.49	PCB 177	5.48 ± 0.20
PCB 99	24.51 ± 0.54	PCB 180	5.31 ± 0.16
PCB 101	39.84 ± 0.96	PCB 183	7.06 ± 0.26
PCB 105	16.47 ± 0.43	PCB 187	15.52 ± 0.48
PCB 110	35.88 ± 0.87	PCB 194	0.485 ± 0.040

Certified Concentration Values for Selected Chlorinated Pesticides in NIST-2974A

	Mass Fraction µg/kg (dry-mass basis)		Mass Fraction µg/kg (dry-mass basis)
Hexachlorobenzene	0.113 ± 0.007	cis-Chlordane	8.54 ± 0.17
4,4'-DDE	17.37 ± 0.82	trans-Chlordane	7.12 ± 0.15
4,4'-DDD	13.56 ± 0.58	cis-Nonachlor	1.91 ± 0.10
4,4'-DDT	6.78 ± 0.32	trans-Nonachlor	5.60 ± 0.39

Certified Concentration Values for Selected PBDE Congeners in NIST-2974A

	Mass Fraction µg/kg (dry-mass basis)		Mass Fraction µg/kg (dry-mass basis)
PBDE 28	0.905 ± 0.051	PBDE 153	0.201 ± 0.014
PBDE 49	1.36 ± 0.06	PBDE 209	1.99 ± 0.11
PBDE 99	4.78 ± 0.24		

Certified Concentration Value of Methylmercury, Inorganic Mercury, and Total Mercury in NIST-2974A

	Mass Fraction µg/kg (dry-mass basis)		Mass Fraction µg/kg (dry-mass basis)
Methylmercury	69.06 ± 0.81	Total Mercury	195 ± 3
Inorganic Mercury	122 ± 3		

Reference values for selected PAHs, PCBs and PBDE Congeners.

NIST-2976	Mussel tissue -Trace elements and methylmercury	25 g

Certified values

As	13.3 mg/kg	Se	1.80 mg/kg
Cd	0.82 mg/kg	Zn	137 mg/kg
Cu	4.02 mg/kg	Methylmercury	27.8 µg/kg
Fe	171 mg/kg	Total mercury	61.0 µg/kg
Pb	1.19 mg/kg		

Indicative values for: Ag, Al, Br, Ca, Ce, Cl, Co, Cr, Cs Eu, K, Mg, Mn, Na, Ni, P, Pb, Rb, S, Sc, Sn, Sr, Th, Tl

Code	Product	Unit
NIST-3275	Fish oil - Omega-3 and omega-6 fatty acids	6 x 1.2 mL

This Standard Reference Material (SRM®) is intended primarily for validation of methods for determining fatty acids in fish oils and similar materials. This SRM can also be used for quality assurance when assigning values to in-house reference materials. SRM 3275 consists of three individual oils: NIST-3275-1, a concentrate high in docosahexaenoic acid (DHA); NIST-3275-2, an anchovy oil high in DHA and eicosapentaenoic acid (EPA); and NIST-3275-3, a concentrate containing 60 % long-chain omega-3 fatty acids. A unit of NIST-3275 consists of two ampoules of each of the three oils, each ampoule containing approximately 1.2 mL of material.

Certified mass fraction values for fatty acids as fatty acid methyl esters (FAMEs)

	Mass fraction (mg/kg)		
	SRM 3275-1	SRM 3275-2	SRM 3275-3
Dodecanoic acid (C12:0; Lauric acid)			0.95 ± 0.12
Tetradecanoic acid (C14:0; Myristic acid)	1.094 ± 0.053	3.45 ± 0.40	67.9 ± 1.5
Hexadecanoic acid (C16:0; Palmitic acid)	5.25 ± 0.35	8.01 ± 0.44	186.9 ± 9.4
(Z)-9-Hexadecenoic acid (C16:1 n-7) (Palmitoleic acid)	7.43 ± 0.24	5.83 ± 0.45	85.7 ± 3.1
Octadecanoic acid (C18:0; Stearic acid)	4.22 ± 0.13	12.94 ± 0.62	38.0 ± 5.7
(Z)-9-Octadecenoic acid (C18:1 n-9) (Oleic acid)	11.25 ± 0.93	22.1 ± 1.6	112.3 ± 2.6
(Z)-11-Octadecenoic acid (C18:1 n-7) (Vaccenic acid)	5.33 ± 0.35	9.24 ± 0.77	38.5 ± 2.2
ω-6 (Z,Z)-9,12-Octadecadienoic acid (C18:2 n-6) (Linoleic acid)	2.31 ± 0.19	3.00 ± 0.42	13.49 ± 0.45
ω-3 (Z,Z,Z)-9,12,15-Octadecatrienoic acid (C18:3 n-3) (α-Linolenic acid; ALA)		14.99 ± 0.37	9.08 ± 0.22
Eicosanoic acid (C20:0; Arachidic acid)		0.357 ± 0.027	1.14 ± 0.26
(Z)-11-Eicosenoic acid (C20:1 n-9) (Gondoic acid)		6.66 ± 0.69	2.92 ± 0.14
ω-3 (Z,Z,Z,Z,Z)-5,8,11,14,17-Eicosapentaenoic acid (C20:5 n-3; EPA)	113 ± 12	460 ± 34	199.1 ± 7.8
Docosanoic acid (C22:0; Behenic acid)	4.02 ± 0.24	1.396 ± 0.046	0.502 ± 0.047
ω-3 (Z,Z,Z,Z,Z,Z)-4,7,10,13,16,19-Docosahexaenoic acid (C22:6 n-3; DHA)	524 ± 42	267 ± 12	163.5 ± 7.2
(Z)-13-Docosenoic acid (C22:1 n-9; Erucic acid)		3.43 ± 0.32	
(Z,Z,Z,Z,Z,)-7,10,13,16,19-Docosapentaenoic acid (C22:5; DPA)	87.2 ± 6.7	81.5 ± 4.4	37.9 ± 2.9
Tetracosanoic acid (C24:0; Lignoceric acid)		1.41 ± 0.13	

Indicative values for further fatty acids as fatty acid methyl esters.

NRCCARP-2	Fish (common carp) - Dioxins, furans and PCBs	6 x 9 g

Prepared from common carp (Cyprinus carpio) collected near the warm water discharge of the Consumer's Power Plant in Saginaw Bay, Lake Huron, Canada

Certified values

PCB18 ..... 27.3 µg/kg	PCB118 ..... 148 µg/kg	PCB194 ..... 10.9 µg/kg
PCB28 ..... 34.0 µg/kg	PCB128 ..... 20.4 µg/kg	PCB206 ..... 4.4 µg/kg
PCB44 ..... 86.6 µg/kg	PCB153 ..... 105 µg/kg	
PCB52 ..... 138 µg/kg	PCB180 ..... 53.3 µg/kg	

Reference Values

2,3,7,8-TCDF ..... 18.2 ng/kg	1,2,3,6,7,8-HxCDD ..... 5.8 ng/kg
1,2,3,7,8-PCDF ..... 5.6 ng/kg	1,2,3,7,8,9-HxCDD ..... 0.78 ng/kg
2,3,7,8-TCDD ..... 7.4 ng/kg	1,2,3,4,6,7,8-HpCDD ..... 6.4 ng/kg
1,2,3,7,8-PCDD ..... 5.3 ng/kg	OCDD ..... 9.4 ng/kg
1,2,3,4,7,8-HxCDD ..... 1.6 ng/kg	

Other reference concentrations for selected PCB congeners and pesticides are given in the certificate.

NRCCRM-ASP-MUS-D	Mussel tissue - Domoic acid (amnesic toxin)	8 g

A homogenised slurry of mussel tissue (*Mytilus edulis* L.).

Certified value:

Domoic acid + C5'-Epidomoic acid ..... 49 µg/g

NRCCRM-AZA-MUS	Mussel tissue - Azaspiracids	8 g

This certified reference material (CRM) is prepared from naturally contaminated mussel tissues *(Mytilus edulis)* containing azaspiracids. This CRM is designed to assist the analyst in assessing entire analytical methods used to monitor AZA toxins in shellfish tissues. Each bottle contains ~8 g of mussel homogenate with AZAs at levels appropriate for analytical testing.

The certified values are:

AZA1 ..... 1.16 µg/g	AZA2 ..... 0.273 µg/g	AZA3 ..... 0.211 µg/g

NRCCRM-DSP-MUS-C	Mussel tissue - Okadaic acid and Dinophysistoxin-1	4 g

A thremally sterilized mix homogenate of mussel (*Mytilus edilus*) and a small amount of the dinoflagellate *Prorocentrum lima*.

Certified values

okadaic acid	1.07 µg/g
dinophysistoxin-1	1.07 µg/g
dinophysistoxin-2	0.86 µg/g
domoic acid (DA)	11.8 µg/g

Code	Product	Unit
NRCCRM-ZERO-MUS	Paralytic Shellfish Toxin Blank. Mussel Matrix	8 g
NRCDOLT-5	Dogfish liver - Trace elements	20 g

Certified values

Arsenic	34.6 ± 2.4 mg/kg	Molybdenum	1.41 ± 0.22 mg/kg
Cadmium	14.5 ± 0.6 mg/kg	Potassium	14,400 ± 3,000 mg/kg
Calcium	550 ± 80 mg/kg	Selenium	8.3 ± 1.8 mg/kg
Cobalt	0.267 ± 0.026 mg/kg	Silver	2.05 ± 0.08 mg/kg
Copper	35.0 ± 2.4 mg/kg	Sodium	9,900 ± 1,600 mg/kg
Iron	1071 ± 80 mg/kg	Strontium	3.73 ± 0.26 mg/kg
Lead	0.162 ± 0.032 mg/kg	Tin	0.069 ± 0.036 mg/kg
Magnesium	940 ± 100 mg/kg	Vanadium	0.51 ± 0.06 mg/kg
Mercury	0.44 ± 0.18 mg/kg	Zinc	105.3 ± 5.4 mg/kg

Reference values for Aluminium, Nickel, Chromium Methylmercury (as Hg) and Manganese.

NRCDORM-4	Fish protein - Trace elements		20 g

Certified values

Arsenic	6.80 ± 0.64 mg/kg	Mercury	0.410 ± 0.055 mg/kg
Cadmium	0.306 ± 0.015 mg/kg	Nickel	1.36 ± 0.22 mg/kg
Copper	15.9 ± 0.9 mg/kg	Tin	0.056 ± 0.010 mg/kg
Chromium	1.87 ± 0.16 mg/kg	Selenium	3.56 ± 0.34 mg/kg
Iron	341 ± 27 mg/kg	Zinc	52.2 ± 3.2 mg/kg
Lead	0.416 ± 0.053 mg/kg	Methylmercury (as Hg)	0.354 ± 0.031 mg/kg

NRCFEBS-1	Otolith - Trace elements		1 g

NRCFEBS-1 is a saggital otolith reference material procured from red snapper (Lutjanus campechanus).

Certified values

Ba	5.09 ± 0.23 mg/kg	Mg	23.6 ± 1.3 mg/kg	Sr	2055 ± 79 mg/kg
Ca	38.3 ± 1.4 %	Mn	0.686 ± 0.016 mg/kg		
Li	0.305 ± 0.044 mg/kg	Na	2594 ± 161 mg/kg		

Indicative values for Cd, Cu, Ni, Pb, Zn

NRCLUTS-1	Non-defatted Lobster Hepatopancreas - Trace elements and methyl-mercury		6 x 10 g

Prepared from edible grade lobster tomalley. Except for the addition of some water and a small quantity of antioxidant the sample is natural biological material containing 55 % lipids on a dry weight basis.

As bottled

Certified values

Ag	0.580 mg/kg	K	948 mg/kg
As	2.83 mg/kg	Mg	89.5 mg/kg
Ca	203 mg/kg	Mn	1.20 mg/kg
Cd	2.12 mg/kg	Ni	0.200 mg/kg
Co	0.051 mg/kg	Pb	0.010 mg/kg
Cr	0.079 mg/kg	Se	0.641 mg/kg
Cu	15.9 mg/kg	Sr	2.46 mg/kg
Fe	11.6 mg/kg	Zn	12.4 mg/kg
Hg	0.0167 mg/kg	Methylmercury (as Hg)	0.0094 mg/kg

Dry weight

Certified values

Ag	3.89 mg/kg	K	6360 mg/kg
As	19.0 mg/kg	Mg	601 mg/kg
Ca	1360 mg/kg	Mn	8.02 mg/kg
Cd	14.2 mg/kg	Ni	1.34 mg/kg
Co	0.34 mg/kg	Pb	0.069 mg/kg
Cr	0.53 mg/kg	Se	4.30 mg/kg
Cu	107 mg/kg	Sr	16.5 mg/kg
Fe	77.8 mg/kg	Zn	82.9 mg/kg
Hg	0.112 mg/kg	Methylmercury (as Hg)	0.063 mg/kg

NRCTORT-3	Lobster hepatopancreas - Trace elements and methyl-mercury		15 g

Partially defatted lobster hepatopancreas prepared from edible grade lobster tomalley.

Certified values

As	59.5 mg/kg	Ni	5.30 mg/kg
Cd	42.3 mg/kg	Pb	0.225 mg/kg
Co	1.06 mg/kg	Se	10.9 mg/kg
Cr	1.95 mg/kg	Sr	36.5 mg/kg
Cu	497 mg/kg	V	9.1 mg/kg
Fe	179 mg/kg	Zn	136 mg/kg
Hg	0.292 mg/kg	Arsenobetaine (as As)	54.9 mg/kg
Mn	15.6 mg/kg	Methylmercury (as Hg)	0.137 mg/kg
Mo	3.44 mg/kg		

Indicative values

Co	1.06 mg/kg	Sn	0.029 mg/kg

Meat and meat products

Code	Product	Unit
LGC7220	Horse meat (100%)	10 g
LGC7221	Beef (100%)	10 g
LGC7222	Pork (100%)	10 g
LGC7223	Sheep meat (100%)	10 g
LGC7224	Chicken meat (100%)	10 g
LGC7225	Turkey meat (100%)	10 g
LGC7240	Horse meat (1%) in beef	3 x 2 g
LGC7241	Horse meat (10%) in beef	3 x 2 g
LGC7242	Pork (1%) in beef	3 x 2 g
LGC7243	Pork (10%) in beef	3 x 2 g
LGC7244	Chicken (1%) in sheep	3 x 2 g
LGC7245	Chicken (5%) in sheep	3 x 2 g
LGC7246	1% Turkey meat in sheep meat	3 x 2 g
LGC7247	5% Turkey meat in sheep meat	3 x 2 g
LGC7248	Beef in sheep meat	3 x 2 g
LGC7249	Beef in sheep meat	3 x 2 g
BCR-163	Beef/pork fat blend - Fatty acids The entire fatty acid (methyl ester) profile was determined but certified values are only given for the major components (>2%) and indicative values are given for all minor components. Methyl esters (mass fraction fatty acid methyl ester/total fatty acid methyl ester) Certified values 14:0 n-Tetradecanoic acids ..... 2.29 g/100 g 16:0 n-Hexadecanoic acid ..... 25.96 g/100 g 16:1 n-Hexadecanoic acids ..... 2.58 g/100 g 18:0 n-Octadecenoic acids ..... 18.29 g/100 g 18:1 n-Octadecenoic acids ..... 38.34 g/100 g 18:2 n-Octadecadienoic acids ..... 7.05 g/100 g 18:3 n-Octadecatrienoic acids ..... 0.86 g/100 g Sterols (mass fraction in fat) Certified value Cholesterol ..... 133.6 mg/100 g Indicative values for additional methyl esters of fatty acids	2 amps.
BCR-185R	Bovine liver - Trace elements Certified values As ..... 33.0 µg/kg Cd ..... 544 µg/kg Cu ..... 277 mg/kg Mn ..... 11.07 mg/kg Pb ..... 172 µg/kg Se ..... 1680 µg/kg Zn ..... 138.6 mg/kg	15 g
BCR-411	Bovine muscle - Diethylstilbestrol (+4 degrees) BCR-411 is intended to be used fort he quality control of methods determining diethylstilbesterol. Certified value Diethylstilbestrol ..... >0.5 µg/L	5 g
BCR-412	Bovine muscle - Diethylstilbestrol BCR-412 is intended to be used for the quality control of methods determining diethylstilbesterol. It can be used to establish recovery values and detection limits through spiking experiments and also to check the specificity of a method. Certified value Diethylstilbestrol ..... <0.1 µg/L	5 g
BCR-444	Porcine muscle - Chloramphenicol (blank) Certified value Chloramphenicol ..... <0.2 µg/kg	7 g
BCR-474/475	Bovine liver - Trenbolone Set of 2 x 2.8 g lyophylised liver powder Certified values BCR-474 17alpha-Trenbolone . <0.5 µg/kg BCR-475 17alpha-Trenbolone ... 7.6 µg/kg	set

Code	Product	Unit
BCR-487	Pig liver - Vitamins Certified values B_1 (thiamin) ..... 8.6 mg/kg B_2 (riboflavin) ..... 106.8 mg/kg B_6 (total pyridoxine) ..... 19.3 mg/kg B_{12} ..... 1.12 mg/kg Folate (total) ..... 13.3 mg/kg	15 g
BCR-648-9	Bovine liver - Clenbuterol Set of 2 x 10 g lyophilised bovine liver Certified values BCR-648 Clenbuterol ..... <0.5 µg/kg BCR-649 Clenbuterol ..... 1.2 µg/kg	set
BCR-695	Pig liver - Chlortetracycline Certified value Chlortetracycline ..... < 0.004 mg/kg	vial
BCR-696	Pig liver - Chlortetracycline Certified value Chlortetracycline ..... 0.58 ± 0.11 mg/kg	vial
BCR-697	Pig muscle - Chlortetracycline Certified value Chlortetracycline ..... < 0.006 mg/kg	vial
BCR-706	Pig kidney - Chlortetracycline Certified value Chlortetracycline ..... < 0.005 mg/kg	vial
BCR-707	Pig Kidney - Chlortetracycline (CTC) Certified value Chlortetracycline (CTC) ..... 1.30 mg/kg	5 g
ERM-BB124	Pork muscle - Nitroimidazoles Nitroimidazoles in the reconstituted material Compound / Certified value µg/kg / Uncertainty µg/kg Ronidazole (RNZ) ..... 2.09 ..... 0.25 Metronidazole (MNZ) ..... 1.93 ..... 0.15 2-hydroxymethyl-1-methyl-5-nitroimidazole (HMMNI) ..... 0.69 ..... 0.09 Hydroxymetronidazole (MNZOH) ..... 6.2 ..... 0.9 Hydroxyipronidazole (IPZOH) ..... 1.67 ..... 0.12 Dimetridazole (DMZ) ..... < 0.25	10 g
ERM-BB130	Pork muscle - Chloramphenicol Certified value Chloramphenicol ..... 0.230 ± 0.021µg/kg	bottle
ERM-BB184	Bovine muscle - Trace elements Certified values As ..... 0.0234 mg/kg Cd ..... 0.0022 mg/kg Cu ..... 2.31 mg/kg Fe ..... 75 mg/kg Mn ..... 0.276 mg/kg Se ..... 0.45 mg/kg Zn ..... 146 mg/kg Indicative values for Hg	7 g
ERM-BB186	Pig kidney - Trace elements Certified values Cd ..... 1.09 mg/kg Cu ..... 36.5 mg/kg Fe ..... 255 mg/kg Mn ..... 7.26 mg/kg Pb ..... 0.040 mg/kg Se ..... 10.3 mg/kg Zn ..... 134 mg/kg	10 g

Code	Product	Unit

ERM-BB384 — Pork muscle - Proximates and essential elements — 2 vials

One set consists of two amber glass vials each containing about 18 g of lyophilised pork muscle filled under protective atmosphere (argon).

	Certified value	Uncertainty
Kjeldahl nitrogen	14.2 g/100 g	0.4 g/100 g
Total fat	8.99 g/100 g	0.20 g/100 g
Ash	4.51 g/100 g	0.19 g/100 g
Na	1.86 mg/g	0.15 mg/g
Mg	1.03 mg/g	0.04 mg/g
Ca	0.164 mg/g	0.021 mg/g
P	8.7 mg/g	0.5 mg/g

ERM-BB430 — Pork fat - Organochlorine pesticides — 5 g

The sample is a homogeneous pork fat spiked with organochlorine pesticides.

Compound	Certified value mg/kg	Uncertainty mg/kg
HCB	0.193	0.017
alpha-HCH	0.25	0.04
beta-HCH	0.109	0.010
beta-HEPO	0.213	0.016
p,p'-DDT	0.48	0.07
p,p'-DDD	0.222	0.022
p,p'-DDE	0.38	0.09

ERM-BB444 — Pork fat - PCBs (blank) — 5 g

Certified values

PCB 28 <2 µg/kg	PCB 118 <2 µg/kg	PCB 180 <2 µg/kg
PCB 52 <2 µg/kg	PCB 138 <2 µg/kg	PCB sum <14 µg/kg
PCB 101 <2 µg/kg	PCB 153 <2 µg/kg	

Indicative value for 2,2',4,4'-Tetrabromodiphenyl ether (BDE 47)

ERM-BB445 — Pork fat - PCBs (low level) — 5 g

Compound	Certified value µg/kg	Uncertainty µg/kg
PCB 28	14.8	1.3
PCB 52	12.9	0.9
PCB 101	12.5	1.2
PCB 118	12.7	1.3
PCB 138	14.6	1.6
PCB 153	13.1	1.1
PCB 180	12.6	0.9
PCB sum	93	7

Indicative value for 2,2',4,4'-Tetrabromodiphenyl ether (BDE 47)

ERM-BB446 — Pork fat - PCB (high level) — 5 g

Compound	Certified value µg/kg	Uncertainty µg/kg
PCB 28	29.6	2.1
PCB 52	25.5	1.8
PCB 101	30	4
PCB 118	30.2	2.7
PCB 138	32	4
PCB 153	30.8	2.4
PCB 180	29.8	2.5
PCB sum	207	11

Indicative value for 2,2',4,4'-Tetrabromodiphenyl ether (BDE 47)

ERM-BB501 — Processed meat - Proximates, chloride, hydroxyproline & metals — 50 g

European Reference Material ERM-BB501 is a pork-based processed meat containing dry pork protein and pea starch. This material is sealed in retort pouches in 180g portions.

Certified values

Moisture	68.59 (g/100 g)	Calcium	5.9 (mg/100 g)
Nitrogen	2.723 (g/100 g)	Iron	0.78 (mg/100 g)
Total fat	11.57 (g/100 g)	Magnesium	18.0 (mg/100 g)
Ash	2.998 (g/100 g)	Phosphorus	278 (mg/100 g)
Chloride	1.110 (g/100 g)	Potassium	286 (mg/100 g)
Hydroxyproline	0.197 (g/100 g)	Sodium	873 (mg/100 g)

Additional information

Nitrate (as NO3)	16 (mg/kg)
Nitrite (as NO2)	1.3 (mg/kg)

Calculated value

Sodium chloride (NaCl)	1.83 (g/100g)

Code	Product	Unit
NIST-1546A	Meat homogenate - Nutrients	4 x 85 g

This Standard Reference Material (SRM) is intended primarily for validation of methods for determining fatty acids, cholesterol, proximates, calories, elements, vitamins, and amino acids in canned meat products and similar materials. This SRM can also be used for quality assurance when assigning values to in-house reference materials. The meat homogenate is a mixture of pork and chicken products blended together in a commercial process.

Certified values for mass fractions for Fatty Acids (as Free Fatty Acids) and Cholesterol.

Dodecanoic Acid (C12:0)	0.0153 ± 0.0011 (g/100 g)
Tetradecanoic Acid (C14:0)	0.245 ± 0.023 (g/100 g)
(Z)-9-Tetradecenoic Acid (C14:1 n-5)	0118 ± 0.0028 (g/100 g)
Hexadecanoic Acid (C16:0)	4.63 ± 0.53 (g/100 g)
(Z)-9-Hexadecenoic Acid (C16:1 n-7)	0.618 ± 0.078 (g/100 g)
Octadecanoic Acid (C18:0)	2.18 ± 0.32 (g/100 g)
(Z)-9-Octadecenoic Acid (C18:1 n-9)	8.09 ± 0.40 (g/100 g)
(Z)-11-Octadecenoic Acid (C18:1 n-7)	0.324 ± 0.017 (g/100 g)
(Z,Z)-9,12-Octadecadienoic Acid (C18:2 n-6)	3.32 ± 0.42 (g/100 g)
(Z,Z,Z)-9,12,15-Octadecatrienoic Acid (C18:3 n-3)	0.133 ± 0.020 (g/100 g)
Eicosanoic Acid (C20:0)	0.0329 ± 0.0009 (g/100 g)
(Z)-11-Eicosenoic Acid (C20:1 n-9)	0.1322 ± 0.0044 (g/100 g)
(Z,Z,Z,Z)-5,8,11,14-Eicosatetraenoic Acid (C20:4 n-6)	0.0201 ± 0.0011 (g/100 g)
Docosanoic Acid (C22:0)	0.0442 ± 0.0010 (g/100 g)
Tetracosanoic Acid (C24:0)	0.0068 ± 0.0003 (g/100 g)
(Z)-15-Tetracosenoic Acid (C24:1 n-9)	0.0228 ± 0.0009 (g/100 g)
Cholesterol(d)	0.717 ± 0.022 (mg/g)

Certified Mass Fraction Values for Elements in SRM 1546a

Copper (Cu)	0.605 ± 0.051 (mg/kg)
Iron (Fe)	10.17 ± 0.35 (mg/kg)
Magnesium (Mg)	178.1 ± 4.8 (mg/kg)
Manganese (Mn)	0.286 ± 0.024 (mg/kg)
Phosphorus (P	1651 ± 32 (mg/kg)
Potassium (K	2490 ± 210 (mg/kg)
Selenium (Se	0.288 ± 0.009 (mg/kg)
Sodium (Na	9600 ± 1100 (mg/kg)
Zinc (Zn	17.88 ± 0.35 (mg/kg)

Certified Mass Fraction Values for Vitamins in SRM 1546a

Niacin (Vitamin B3)	0.401 ± 0.022 (mg/kg)
Niacinamide (Vitamin B3)	38.18 ± 0.74 (mg/kg)
Total Vitamin B3 as Niacinamide	41.0 ± 4.8 (mg/kg)
Pantothenic Acid (Vitamin B5)	4.58 ± 0.59 (mg/kg)
Pyridoxamine Dihydrochloride (VitaminB6)	0.390 ± 0.078 (mg/kg)

Reference mass fraction values, reported on an as-received basis, are also provided for additional fatty acids, additional elements, additional vitamins, proximates, calories and amino acids. A NIST reference value is a noncertified value that is the best estimate of the true value based on available data; however, the value does not meet the NIST criteria for certification and is provided with associated uncertainties that may reflect only measurement reproducibility, may not include all sources of uncertainty, or may reflect a lack of sufficient statistical agreement among multiple analytical methods. The reference mass fraction values were derived from results reported by NIST or collaborating laboratories.

NIST-1577C	Bovine liver - Trace elements	20 g

Standard Reference Material (SRM) 1577c consists of tissue derived from healthy steers. The material was collected and prepared under strict protocols designed to preserve the original composition, and to minimize contamination. NIST-1577c is intended primarily for use in evaluating the accuracy of analytical methods for selected elements in animal tissues and other biological materials. A unit of the SRM consists of one bottle containing 20 g of freeze-dried liver powder.

Certified values for mass fractions (on a dry-mass basis) of selected elements

Ag 5.9 ± 1.6 µg/kg	Fe 197.94 ± 0.65 mg/kg	Pb 62.8 ± 1.0 µg/kg
As 19.6 ± 1.4 µg/kg	K 1.023 ± 0.064 %	S 0.749 ± 0.034 %
Ca 131 ± 10 mg/kg	Mg 620 ± 42 mg/kg	Se 2.031 ± 0.045 mg/kg
Cd 97.0* ± 1.4 µg/kg	Mn 10.46 ± 0.47 mg/kg	Sr 95.3 ± 4.2 µg/kg
Co 0.300 ± 0.018 mg/kg	Mo 3.30 ± 0.13 mg/kg	V 8.17 ± 0.66 µg/kg
Cr 53 ± 14 µg/kg	Na 0.2033 ± 0.0064 %	Zn 181.1 ± 1.0 mg/kg
Cu 275.2 ± 4.6 mg/kg	Ni 44.5 ± 9.2 µg/kg	

Milk and dairy products

Code	Product	Unit
LGC7104	**Sterilised cream - Proximates and nutrient elements** LGC7104 is a cream product, sealed in cans in 170g portions. Assessed values Moisture 70.2 g/100 g; Nitrogen 0.40 g/100 g; Total fat 22.7 g/100 g; Ash 0.58 g/100 g Ca 845 mg/kg; K 1160 mg/kg; Mg 84 mg/kg; Na 505 mg/kg P 823mg/kg; Zn 3.1 mg/kg Indicative values for Cl, Lactose	170 g
BCR-187	**Natural milk powder - Pesticides** Compound / Certified value µg/kg / Uncertainty µg/kg HCB 1.50 0.2 alpha-HCH 1.8 0.14 gamma-HCH 5.7 0.7 4,4'-DDE 6.6 0.6	20 g
BCR-188	**Milk powder (spiked) - Pesticides** Compound / Certified value µg/kg / Uncertainty µg/kg HCB 37.4 2.7 beta-HCH 12.0 1.2 gamma-HCH 45.4 2.9 beta-Heptachlor epoxide 32.0 1.8 4,4'-DDE 51.3 3.5 Dieldrin 36.1 2.4 Endrin 6.2 0.9 4,4'-DDT 69.0 4.6	20 g
BCR-380R	**Whole milk powder - Major nutrients** Certified values Crude protein (Kjeldahl-N x 6.38) 28.66 ± 0.28 g/100 g Fat 26.95 ± 0.16 g/100 g Lactose (anhydrous) 37.1 ± 1.0 g/100 g Ash 6.00 ± 0.13 g/100 g	100 g
BCR-450	**Natural milk powder - PCBs** Compound / Certified value µg/kg / Uncertainty µg/kg PCB 52 1.16 0.17 PCB 118 3.3 0.4 PCB 153 19.0 0.7 PCB 156 1.62 0.2 PCB 170 4.8 0.6 PCB 180 11.0 0.7	20 g
BCR-492-3	**Lyophilized skimmed milk powder - Oxytetracycline** Set of BCR-492 and BCR-493 BCR-492 Certified value Oxytetracyline 307 µg/L BCR-493 Certified value Oxytetracyline <10 µg/L	set

Code	Product	Unit
BCR-519	Anhydrous butter fat - Triglycerides	2 amps.

Triglyceride contents of an anhydrous butter fat with additional value for free cholesterol.

Compound	Certified value mass fraction (%)	Uncertainty mass fraction (%)
Cholesterol	0.30	0.03
C24	0.05	0.02
C26	0.25	0.03
C28	0.59	0.04
C30	1.15	0.05
C32	2.43	0.12
C34	5.64	0.18
C36	10.47	0.19
C38	12.53	0.22
C40	10.03	0.16
C42	6.69	0.10
C44	6.11	0.08
C46	6.86	0.08
C48	8.69	0.15
C50	11.40	0.24
C52	10.96	0.25
C54	5.89	0.13

Code	Product	Unit
BCR-528	*Bacillus cereus* in milk powder	10 caps.

BCR-528 consists of 0.317 g artificially contaminated with spray dried milk contained in an ochre/white gelatine capsule. The strain used for the contamination is *Bacillus cereus* (ATCC 9139).

Colony forming particles of *Bacillus cereus* according to the procedure	Number of colony forming particles (cfp) Certified value [cfp/capsule]	Uncertainty interval [cfp/capsule]
MEYP (ISO 7932) after 24 h incubation	53.4	51.7 – 55.2
MEYP (ISO 7932) after 48 h incubation	53.7	52.1 – 55.4
PEMBA (L 00.00 - 25) after 24 h incubation	55.0	52.8 – 57.4
PEMBA (L 00.00 - 25) after 48 h incubation	55.8	53.6 – 58.0

Indicative value for colony forming particles of *Bacillus cereus* according to the procedure SBA (Analysis no 67) after 24 h incubation

Dry ice shipment required

Code	Product	Unit
BCR-599	Ewes'/Goats' curd - Adulteration with cows' milk	set (2)

Two freeze dried curd materials made from a mixture of ewes' and goats' milk intended to detect adulteration by cows' milk in cheeses made from ewes' milk, goats' milk and mixtures of the two.

Unadulterated material 0% cows' milk

Adulterated material 1% cows' milk

Code	Product	Unit
BCR-607	Natural spray dried milk powder - Dioxins and furans	100 g

Compound	Certified value ng/kg	Uncertainty ng/kg
2,3,7,8-TCDD	0.25	0.03
1,2,3,7,8-PeCDD	0.79	0.04
1,2,3,4,7,8-HxCDD	0.42	0.07
1,2,3,6,7,8-HxCDD	0.98	0.11
1,2,3,7,8,9-HxCDD	0.34	0.05
2,3,7,8-TCDF	0.05	0.03
1,2,3,7,8-PeCDF	0.054	0.013
2,3,4,7,8-PeCDF	1.81	0.13
1,2,3,4,7,8-HxCDF	0.94	0.04
1,2,3,6,7,8-HxCDF	1.01	0.09
2,3,4,6,7,8-HxCDF	1.07	0.05

Code	Product	Unit
BCR-632	Butter fat - cholesterol and triglyceride BCR-623 consists of a 5 mL ampoule of BCR-632a and a 5 mL ampoule of BCR-632b Certified values	2 amps.

BCR-632A Pure butter fat - Cholesterol and triglycerides

Compound	certified value g/100 g	Uncertainty g/100 g
C24	0.07	0.04
Cholesterol	0.289	0.012
C26	0.33	0.06
C28	0.74	0.07
C30	1.37	0.08
C32	2.83	0.14
C34	6.09	0.29
C36	10.7	0.5
C38	12.5	0.4
C40	10.05	0.19
C42	7.07	0.13
C44	6.68	0.12
C46	7.36	0.17
C48	8.74	0.21
C50	10.74	0.24
C52	9.8	0.4
C54	4.7	0.5

BCR-632B Adulterated butter fat - Cholesterol and triglycerides

Compound	certified value g/100 g	Uncertainty g/100 g
C24	0.08	0.04
Cholesterol	0.278	0.011
C26	0.34	0.06
C28	0.75	0.06
C30	1.46	0.07
C32	3.30	0.12
C34	6.57	0.25
C36	11.1	0.4
C38	12.7	0.4
C40	10.07	0.17
C42	7.10	0.10
C44	6.57	0.12
C46	7.12	0.17
C48	8.42	0.19
C50	10.28	0.19
C52	9.36	0.28
C54	4.5	0.4

BCR-633 — Anhydrous butter fat - Tracers — Amp.

Compound	certified value mg/kg	Uncertainty mg/kg
ß-Apo-8`-carotenic acid ethyl ester	26.5	1.4
ß-Sitosterol	530	29
Stigmasterol	147	11
n-Heptanoic acid triglyceride	1.06×10^4	0.04×10^4

BCR-685 — Skimmed milk powder - Major nutrients — 50 g

Certified values

Crude protein (Kjeldahl-N x 6.38) 38.2 ± 0.4 g/100 g

Fat 0.96 ± 0.12 g/100 g

ERM-BB492-3 — Partially skimmed milk powder - Oxytetracycline — set

Set of ERM-BB-492 and ERM-BB -493

One unit contains approximately 5.5 g of spray-dried partially skimmed milk filled under inert gas in a 30 mL amber glass vial. The water mass fraction of the spray-dried powder is 2.5 ± 0.08 g/100g.

ERM-BB-492

Certified value

Oxytetracyline (sum of oxytetracycline and 4-epioxytetracycline) 101 ± 11 µg/kg

ERM-BB -493

Certified value

Oxytetracyline (sum of oxytetracycline and 4-epioxytetracycline) <5 µg/kg

Code	Product	Unit
ERM-BD150	Milk powder - Essential nutrients and trace elements Certified values	20 g

Ca	13.9 g/kg	Cu	36.5 mg/kg
Cl	9.7 g/kg	Fe	255 mg/kg
K	17.0 g/kg	Mn	7.26 mg/kg
Mg	1.26 g/kg	Pb	0.040 mg/kg
Na	4.18 g/kg	Se	10.3 mg/kg
P	11.0 g/kg	Zn	134 mg/kg
Cd	1.09 mg/kg		

Code	Product	Unit
ERM-BD151	Milk powder - Essential nutrients and trace elements Certified values	20 g

Ca	13.9 g/kg	Fe	53 mg/kg
Cl	9.8 g/kg	Hg	0.52 mg/kg
K	17.0 g/kg	I	1.78 mg/kg
Mg	1.26 g/kg	Mn	0.29 mg/kg
Na	4.19 g/kg	Pb	0.207 mg/kg
P	11.0 g/kg	Se	0.19 mg/kg
Cd	0.106 mg/kg	Zn	44.9 mg/kg
Cu	5.00 mg/kg		

Code	Product	Unit
ERM-BD282	Whole milk powder - Aflatoxin M1 (zero level)	30 g

Compound	Certified value µg/kg
Aflatoxin M1	< 0.02

Code	Product	Unit
ERM-BD283	Whole milk powder - Aflatoxin M1 (low level)	30 g

Compound	Certified value µg/kg	Uncertainty µg/kg
Aflatoxin M1	0.111	0.018

Code	Product	Unit
ERM-BD284	Whole milk powder - Aflatoxin M1 (high level)	30 g

Compound	Certified value µg/kg	Uncertainty µg/kg
Aflatoxin M1	0.44	0.06

Code	Product	Unit
ERM-BD600	Whole milk powder - Vitamins	100 g

A (all-*trans*-retinol)	3.8 ± 0.6 mg/kg	B_{12} (cyanocobalamin)	0.32 ± 0.07 mg/kg
A (all-*trans*-retinol & 13-*cis*-retinol)	4.1 ± 0.8 mg/kg	C (total ascorbate)	74 ± 11 mg/kg
B_1 (thiamin)	4.5 ± 0.6 mg/kg	E (tocopherol)	86 ± 15 mg/kg
B_2 (riboflavin)	16.7 ± 1.4 mg/kg		

Code	Product	Unit
NIST-1549A	Whole Milk Powder	5 x 10 g

NIST-1549a is intended primarily intended primarily for validation of methods for determining proximates, fatty acids, cholesterol, vitamins, elements, and amino acids in whole milk powder and similar materials. This SRM can also be used for quality assurance when assigning values to in-house reference materials.The SRM is a whole milk powder prepared by a commercial manufacturer. A unit of SRM 1549a consists of five heat-sealed aluminized pouches, each containing approximately 10 g of material.

Certified mass fraction values for fatty acids as free fatty acids and cholesterol.

Octanoic acid (C8:0) (Caprylic acid)	0.338 ± 0.009%
Dodecanoic acid (C12:0) (Lauric acid)	0.8125± 0.090%
Tetradecanoic acid (C14:0) (Myristic acid)	2.62 ± 0.20%
(Z)-9-Tetradecenoic acid (C14:1) (Miyristoleic acid)	0.302 ± 0.040%
Hexadecanoic acid (C16:0) (Palmitic acid)	6.98 ± 0.47 %
(Z)-9-Hexadecenoic acid (C16:1 n-7) (Palmitoleic acid)	0.404 ± 0.0264%
Octadecanoic acid (C18:0) (Stearic acid)	2.68 ± 0.19%
(Z)-9-Octadecenoic acid (C18:1 n-9) (Oleic acid)	10.2 ± 1.1%
(Z)-11-Octadecenoic acid (C18:1 n-7) (Vaccenic acid)	0.160 ± 0.027%
(Z,Z)-9,12-Octadecadienoic acid (C18:2 n-6) (Linoleic acid)	0.689 ± 0.060%
(Z,Z,Z)-9,12,15-Octadecatrienoic acid (C18:3 n-3) (α-Linolenic acid)	0.138 ± 0.010%
Cholesterol	0.981 ± 0.071 mg/g

Certified mass fraction values for selected elements

Barium	0.566 ± 0.039 mg/kg	Selenium	0.242 ± 0.026 mg/kg
Calcium	8810 ± 240 mg/kg	Sodium	3176 ± 58 mg/kg
Magnesium	892 ± 62 mg/kg	Strontium	2.14 ± 0.19 mg/kg
Manganese	0.184 ± 0.024 mg/kg	Zinc	33.8 ± 2.3 mg/kg
Phosphorous	7600 ± 500 mg/kg		

Certified concentrations for selected vitamins

Ascorbic acid (Vitamin C)	41.9 ± 2.5 mg/kg	Pantothenic acid	33.7 ± 2.7 mg/kg
Thiamine Hydrochloride	1.365 ± 0.029 mg/kg	Total Vitamin B6 as Pyridoxidal	2.46 ± 0.20 mg/kg
Riboflavin (Vitamin B2)	10.6 ± 1.9 mg/kg	Pyridoxidal	2.09 ± 0.20 mg/kg
Niacinamide	5.91 ± 0.39 mg/kg	Pyridoxamine	0.372 ± 0.033 mg/kg

Reference mass fraction values, reported on an as-received basis, are provided for additional elements, additional vitamins, choline, and carnitine, proximates, additional fatty acids, calories and amino acids.

Code	Product	Unit
NIST-1849A	Infant/Adult nutritional powder (milk) - Trace elements, proximates and nutrients	10 x 10 g

NIST-1849a is intended primarily for validation of methods for determining proximates, fatty acids, vitamins, elements, amino acids and nucleotides in infant and adult nutritional formulas and similar materials. It can also be used for quality assurance when assigning values to in-house reference materials. This material is a milk-based, hybrid infant/adult nutritional powder prepared by a manufacturer of infant formula and adult nutritional products. A unit of NIST-1849a consists of 10 packets, each containing approximately 10 g of material.

Certified mass fraction values for fatty acids as free fatty acids and cholesterol

Octanoic acid (C8:0) ..... 0.588 ± 0.049%
(Caprylic acid)
Dodecanoic acid (C12:0) ..... 2.877± 0.092%
(Lauric acid)
Tetradecanoic acid (C14:0) ..... 0.968 ± 0.032%
(Myristic acid)
(Z)-9-Tetradecenoic acid (C14:1) ..... 0.0023 ± 0.0001%
(Miyristoleic acid)
Hexadecanoic acid (C16:0) ..... 1.99 ± 0.22 %
(Palmitic acid)
(Z)-9-Hexadecenoic acid (C16:1 n-7) ..... 0.0221 ± 0.0014%
(Palmitoleic acid)
Octadecanoic acid (C18:0) ..... 0.835 ± 0.017%
(Stearic acid)
(Z)-9-Octadecenoic acid ..... 10.2 ± 1.1%
(C18:1 n-9) (Oleic acid)
(Z)-11-Octadecenoic acid (C18:1 n-7) ..... 0.2034 ± 0.0068%
(Vaccenic acid)
(Z,Z)-9,12-Octadecadienoic acid (C18:2 n-6) ..... 5.24 ± 0.42%
(Linoleic acid)
(Z,Z,Z)-9,12,15-Octadecatrienoic acid (C18:3 n-3) ..... 0.516 ± 0.050%
(α-Linolenic acid)
Eicosanoic acid (C20:0) ..... 0.0808 ± 0.0026%
(Arachidic acid)
(Z)-11 Eicosenoic acid (C20:1 n-9) ..... 0.0589 ± 0.0037%
(Gondoic acid)
Docosanoic acid (C22:0) ..... 0.0642 ± 0.024%
(Behenic acid)
Tetracosanoic acid (C24:0) ..... 0.0333 ± 0.0016%
(Lignoceric acid)
(Z)-15-Tetracosenoic acid (C24:1 n-9) ..... 0.0207 ± 0.0015%
(Nervonic acid)

Certified mass fraction values for selected elements

Ca	5253 ± 51 mg/kg	Mo	1.707 ± 0.040 mg/kg
Cu	19.78 ± 0.26 mg/kg	P	3990 ± 140 mg/kg
Cr	1.072 ± 0.032 mg/kg	K	9220 ± 110 mg/kg
Fe	175.6 ± 2.9 mg/kg	Se	0.812 ± 0.029 mg/kg
Mg	1648 ± 36 mg/kg	Na	4265 ± 83 mg/kg
Mn	49.2 ± 1.4 mg/kg	Zn	151.0 ± 5.6 mg/kg

Certified concentrations for selected vitamins

Ascorbic acid (Vitamin C) ..... 784 ± 65 mg/kg
Thiamine (Vitamin B1) Hydrochloride ..... 12.57 ± 0.98 mg/kg
Riboflavin (Vitamin B2) ..... 20.37 ± 0.52 mg/kg
Niacinamide ..... 109 ± 10 mg/kg
Pantothenic acid ..... 68.2 ± 1.9 mg/kg
Pyridoxine (Vitamin B6) Hydrochloride ..... 13.46 ± 0.93 mg/kg
Folic acid ..... 2.293 ± 0.062 mg/kg
Biotin ..... 1.99 ± 0.13 mg/kg
Choline ion ..... 1090 ± 110 mg/kg
Carnitine ..... 136 ± 14 mg/kg
Retinol (Vitamin A) ..... 7.68 ± 0.23 mg/kg

Cholecalciferol (Vitamin D3) ..... 0.111 ± 0.017 mg/kg
Phylloquinone (Vitamin K1) ..... 1.06 ± 0.17 mg/kg

Reference values for selected fatty acids as triglycerides, proximate, cholesterol, lactose, and calories, selected vitamins, amino acids and nucleotides

Reference values for selected fatty acids as triglycerides, proximate, cholesterol, lactose, and calories, selected vitamins, amino acids and nucleotides

Food packaging

Code	Product	Unit
BCR-537	Plastic film A - Overall migration in olive oil Total immersion in olive oil for 10 days at 40°C Certified value: 8.3 mg/dm^2	film
BCR-538	Plastic film B - Overall migration in olive oil Single sided cell in olive oil for 10 days at 40°C Certified value: 5.7 mg/dm^2	film
BCR-539	Plastic film C - Overall migration in olive oil Pouch in olive oil for 10 days at 40°C Certified value: 6.1 mg/dm^2	film
ERM-EC680K	Polyethylene - Trace elements (low level) Certified values As..... 4.1 mg/kg Cl.....102.2 mg/kg Pb ..... 13.6 mg/kg Br ..... 96 mg/kg Cr .....20.2 mg/kg S ..... 76 mg/kg Cd ..... 19.6 mg/kg Hg.....4.64 mg/kg Sb ..... 10.1 mg/kg	100 g
NIST-2855	Polyethylene - Additive elements This Standard Reference Material (SRM) is intended for the calibration or evaluation of methods for elemental analysis of polymers. A unit of SRM 2855 consists of one bottle of Level I low-density polyethylene, one bottle of Level II high-density polyethylene, and one bottle of Level III high-density polyethylene. Each bottle contains approximately 80 g of material in pellet form. Certified values for NIST-2855 Level II and Level III Level II Na ..... 16.0 ± 1.5mg/kg Ca.....37.6 ± 5.1mg/kg Zn..... 415 ± 20mg/kg P ..... 22.0 ± 1.5mg/kg Ti .....10.4 ± 0.3mg/kg S ..... 21.0 ± 1.4mg/kg Cr .....2.4 ± 0.5mg/kg Level III Na ..... 16.4 ± 1.3mg/kg Ca.....77.2 ± 2.4mg/kg Zn..... 807 ± 15mg/kg P ..... 41.6 ± 2.9mg/kg Ti .....10.4 ± 0.3mg/kg S ..... 41.2 ± 3.1mg/kg Cr .....2.4 ± 0.5mg/kg Indicative values for Level I: Na, Si, P, S, Ca, Ti, Cr, Zn, Br. Cd, Hg and Pb Indicative values for Level II and Level II: Br. Cd. Hg and Pb	3 x 80g

Food oils

BCR-162R — Soya-maize oil blend - Fatty acids — 5.5 g

Certified values

Fatty acid	Relative Mass Fraction in g FAME / 100 g total FAME
16:0 (n-Hexadecanoic acid)	10.74 ± 0.16
18:0 (n-Octadecanoic acid)	2.82 ± 0.04
9c-18:1 (n-Octadecenoic acid)	25.4 ± 0.4
9c,12c-18:2 (n-Octadecadienoic acid)	54.13 ± 0.25
9c,12c,15c-18:3 (n-Octadecatrienoic acid)	3.35 ± 0.05

BCR-349 — Cod liver oil - PCBs — 2 g

Compound	Certified value µg/kg	Uncertainty µg/kg
PCB 28	68	8
PCB 52	149	21
PCB 101	372	18
PCB 118	460	40
PCB 153	940	40
PCB 180	282	23

BCR-446 — Rapeseed - Oil content (low) — 153 g

Certified values

“As is” oil	39.49 g/100 g
Moisture and volatiles	7.01 g/100 g
Dry basis oil	42.48 g/100 g

BCR-459 — Coconut oil - PAHs (blank) — 45 g

Compound	Certified value µg/kg	Compound	Certified value µg/kg
Pyrene	<0.9	Benzo(a)pyrene	<0.3
Chrysene	<0.6	Benzo(ghi)perylene	<0.2
Benzo(k)fluoranthene	<0.2	Indeno(1,2,3-cd)pyrene	<0.2

BCR-598 — Cod liver oil - Organochlorine pesticides — 5 g

Compound	Certified value µg/kg	Uncertainty µg/kg
Hexachlorobenzene	55.7	2
alpha-HCH	42	3
beta-HCH	16	3
gamma-HCH	23	4
gamma-Chlordane	6.9	1.6
alpha-Chlordane	24.4	1.8
Oxychlordane	11	1.8
trans-Nonachlor	39	4
Dieldrin	59	4
4,4’-DDE	0.61×10^3	0.04×10^3
2,4’-DDD	30	4
4,4’-DDD	0.40×10^3	0.03×10^3
4,4’-DDT	0.179×10^3	0.018×10^3

Code	Product	Unit
CIL-EDF-5462	Fortified cod liver oil - PCDDs, PCDFs, PCBs, PBDEs	10 g

CIL- EDF-5462 is a commercially available Cod Liver Oil Reference Material and has been spiked with known amounts of dioxins, furans, and polychlorinated biphenyls. This sample is meant to be used to evaluate the performance of an analytical laboratory for the analytes given

All values are in ng/kg

Analyte	Assigned Value[1]	Standard Deviation	Reference Value[2]	Target Value[3]	(n)[4]
Polychlorinated dioxins & furans					
2,3,7,8-TetraCDD	16.1	1.72	16.1 ± 3.44	17.5	11
Total TetraCDD	15.8	2.10	15.8 ± 4.20		7
2,3,7,8-TetraCDF	1430	140	1430 ± 280	1520	10
Total TetraCDF	1490	135	1490 ± 270		6
1,2,3,7,8-PentaCDD	39.3	2.37	39.3 ± 4.74	43.8	11
Total PentaCDD	39.0	2.80	39.0 ± 5.60		7
1,2,3,7,8-PentaCDF	387	30.4	387 ± 60.8	394	10
2,3,4,7,8-PentaCDF	40.2	3.22	40.2 ± 6.44	38.2	10
Total PentaCDF	435	33.0	435 ± 66.0		7
1,2,3,4,7,8-HexaCDD	39.1	4.88	39.1 ± 9.76	43.8	10
1,2,3,6,7,8-HexaCDD	39.2	3.92	39.2 ± 7.84	43.8	10
1,2,3,7,8,9-HexaCDD	41.1	4.63	41.1 ± 9.26	43.8	9
Total HexaCDD	122	23.3	122 ± 46.6		7
1,2,3,4,7,8-HexaCDF	39.5	2.69	39.5 ± 5.38	43.8	10
1,2,3,6,7,8-HexaCDF	40.9	2.42	40.9 ± 4.84	43.8	10
1,2,3,7,8,9-HexaCDF	39.6	4.15	39.6 ± 8.30	43.8	10
2,3,4,6,7,8-HexaCDF	39.2	3.01	39.2 ± 6.02	43.8	10
Total HexaCDF	157	12.2	157 ± 24.4		7
1,2,3,4,6,7,8-HeptaCDD	40.6	3.25	40.6 ± 6.50	43.8	10
Total HeptaCDD	40.3	3.57	40.3 ± 7.14		7
1,2,3,4,6,7,8-HeptaCDF	41.0	4.58	41.0 ± 9.16	43.8	10
1,2,3,4,7,8,9-HeptaCDF	41.0	3.84	41.0 ± 7.68	43.8	10
Total HeptaCDF	81.0	9.61	81.0 ± 19.2		7
OctaCDD	115	7.66	115 ± 15.3	128	10
OctaCDF	75.4	10.3	75.4 ± 20.6	87.5	10
Polychlorinated biphenyls[5]					
2,2',5-TriCB (#18)	56.7	18.4	56.7 ± 36.8	40.0	7
2,4,4'-TriCB (#28)	450	98.0	450 ± 196	340	9
3,4,4'-TriCB (#37)	56.7	21.5	56.7 ± 43.0	40.0	6
2,2',3,5'-TetraCB (#44)	100	14.0	100 ± 28.0	40.0	5
2,2',4,5'-TetraCB (#49)	101	15.8	101 ± 31.6	40.0	6
2,2',5,5'-TetraCB (#52)	533	112	533 ± 224	340	8
2,3',4,4'-TetraCB (#66)	211	25.7	211 ± 51.4	40.0	5
2,4,4',5-TetraCB (#74)	142	33.7	142 ± 67.4	80.0	6
3,3',4,4'-TetraCB (#77)	50.7	8.03	50.7 ± 16.1	40.0	10
3,4,4',5-TetraCB (#81)	40.7	4.84	40.7 ± 9.68	40.0	10
2,2',4,4',5-PentaCB (#99)	519	62.9	519 ± 126	40.0	8
2,2',4,5,5'-PentaCB (#101)	1020	138	1020 ± 276	340	8
2,3,3',4,4'-PentaCB (#105)	769	76.9	769 ± 154	40.0	12
2,3,3',4',6-PentaCB (#110)	599	81.4	599 ± 163	40.0	8
2,3,4,4',5-PentaCB (#114)	75.4	8.21	75.4 ± 16.4	40.0	11
2,3',4,4',5-PentaCB (#118)	1670	133	1670 ± 266	40.0	11
2',3,4,4',5-PentaCB (#123)	58.2	9.64	58.2 ± 19.3	40.0	10
3,3',4,4',5-PentaCB (#126)	53.3	3.79	53.3 ± 7.58	40.0	10
2,2',3,3',4,4'-HexaCB (#128)	812	255	812 ± 510		9
2,2',3,4,4',5-HexaCB (#137)	143	23.0	143 ± 46.0		5
2,2',3,4,4',5'-HexaCB (#138)	4190	793	4190 ± 1590	340	10
2,2',3,4,5,5'-HexaCB (#141)	256	40.6	256 ± 81.2		6
2,2',3,4',5',6-HexaCB (#149)	819	242	819 ± 484	40.0	7
2,2',3,5,5',6-HexaCB (#151)	231	69.7	231 ± 139		7
2,2',4,4',5,5'-HexaCB (#153)	4240	333	4240 ± 666	340	11
2,3,3',4,4',5-HexaCB (#156)	501	66.9	501 ± 134	80.0	12
2,3,3',4,4',5'-HexaCB (#157)	168	14.8	168 ± 29.6	80.0	10
2,3,3',4,4',6-HexaCB (#158)	274	17.8	274 ± 35.6		5
2,3',4,4',5,5'-HexaCB (#167)	271	27.2	271 ± 54.4	40.0	10
3,3',4,4',5,5'-HexaCB (#169)	44.1	4.79	44.1 ± 9.58	40.0	11
2,2',3,3',4,4',5-HeptaCB (#170)	956	84.8	956 ± 170	40.0	10
2,2',3,3',4',5,6-HeptaCB (#177)	207	22.7	207 ± 45.4		7
2,2',3,3',5,5',6-HeptaCB (#178)	194	25.2	194 ± 50.4	40.0	6
2,2',3,4,4',5,5'-HeptaCB (#180)	2510	203	2510 ± 406	340	11
2,2',3,4,4',5',6-HeptaCB (#183)	338	36.4	338 ± 72.8		9
2,2',3,4',5,5',6-HeptaCB (#187)	859	86.9	859 ± 174	40.0	9
2,3,3',4,4',5,5'-HeptaCB (#189)	93.2	8.31	93.2 ± 16.6	40.0	11
2,2',3,3',4,4',5,5'-OctaCB (#194)	302	57.9	302 ± 116	40.0	7
2,2',3,3',4,4',5,5',6-NonaCB(#206)	130	30.7	130 ± 61.4	40.0	7
2,2',3,3',4,5,5',6,6'-NonaCB(#208)	72.1	11.4	72.1 ± 22.8	40.0	6
DecaCB (#209)	488	82.0	488 ± 164	340	7
Brominated diphenyl ethers[5]					
2,2',4-TriBDE (#17)	8.83	2.88	8.83 ± 5.76		7
2,4,4'-TriBDE (#28)	40.1	6.95	40.1 ± 13.9		6
2,2',4,4'-TetraBDE (#47)	1480	240	1480 ± 480		8
2,3',4,4'-TetraBDE (#66)	48.4	14.7	48.4 ± 29.4		6
2,2',4,4',5-PentaBDE (#99)	193	35.2	193 ± 70.4		7
2,2',4,4',6-PentaBDE (#100)	357	25.3	357 ± 50.6		7
2,2',4,4',5,5'-HexaBDE (#153)	33.9	3.32	33.9 ± 6.64		7
2,2',4,4',5,6'-HexaBDE (#154)	229	44.4	229 ± 88.8		7

[1] Assigned value as determined by TRIUM Inc. (Canada) using STATISTICA data analysis software analysis of raw interlaboratory study data.
[2] Reference value is the Assigned Value plus or minus two standard deviations. Negative numbers resulting from two standard deviations being greater than the assigned value have no significance.
[3] Target value is the value provided by TestAmerica, Inc. that was used to spike the Cod liver oil sample. This value is independent of and may be in addition to analytes present in blank.
[4] Number of laboratories providing results for this analyte.
[5] All numbers in parentheses refer to the IUPAC designation for the compound.

Code	Product	Unit

CIL-EDF-5463 — Cod liver oil - PCBs, PBDEs — 10 g

CIL-EDF-5463 is a Cod Liver Oil Reference Material purchased from TestAmerica Corporation in Knoxville, TN. The pure Norwegian cod liver oil is commercially available. This sample is meant to be used to evaluate the performance of an analytical laboratory for the analytes given.

All values are in ng/kg

Analyte	Assigned Value[1]	Standard Deviation	Reference Value[2]	(n)[3]
Polychlorinated biphenyls[4]				
2,4,4'-TriCB (#28)	50.4	11.6	50.4 ± 23.2	6
2,2',3,5'-TetraCB (#44)	60.7	10.7	60.7 ± 21.4	5
2,2',5,5'-TetraCB (#52)	153	36.2	153 ± 72.4	8
2,3',4,4'-TetraCB (#66)	171	21.5	171 ± 43.0	5
2,4,4',5-TetraCB (#74)	102	17.3	102 ± 34.6	6
3,3',4,4'-TetraCB (#77)	9.61	1.87	9.61 ± 3.74	8
2,2',4,4',5-PentaCB (#99)	474	59.0	474 ± 118	8
2,2',4,5,5'-PentaCB (#101)	661	97.4	661 ± 195	8
2,3,3',4,4'-PentaCB (#105)	732	69.5	732 ± 139	11
2,3,3',4',6-PentaCB (#110)	567	89.7	567 ± 179	9
2,3,4,4',5-PentaCB (#114)	34.5	7.74	34.5 ± 15.5	10
2,3',4,4',5-PentaCB (#118)	1590	148	1590 ± 296	11
2',3,4,4',5-PentaCB (#123)	22.8	7.15	22.8 ± 14.3	9
3,3',4,4',5-PentaCB (#126)	15.2	4.13	15.2 ± 8.26	10
2,2',3,3',4,4'-HexaCB (#128)	767	223	767 ± 446	9
2,2',3,4,4',5-HexaCB (#137)	134	17.7	134 ± 35.4	5
2,2',3,4,4',5'-HexaCB (#138)	3810	638	3810 ± 1280	10
2,2',3,4,5,5'-HexaCB (#141)	253	34.4	253 ± 68.8	6
2,2',3,4',5,6-HexaCB (#149)	762	237	762 ± 474	7
2,2',3,5,5',6-HexaCB (#151)	235	73.0	235 ± 146	7
2,2',4,4',5,5'-HexaCB (#153)	3890	450	3890 ± 900	11
2,3,3',4,4',5-HexaCB (#156)	456	69.2	456 ± 138	12
2,3,3',4,4',5'-HexaCB (#157)	124	11.6	124 ± 23.2	10
2,3,3',4,4',6-HexaCB (#158)	272	36.7	272 ± 73.4	5
2,3',4,4',5,5'-HexaCB (#167)	234	26.5	234 ± 53.0	10
3,3',4,4',5,5'-HexaCB (#169)	4.39	0.579	4.39 ± 1.16	7
2,2',3,3',4,4',5-HeptaCB (#170)	917	85.9	917 ± 172	10
2,2',3,3',4',5,6-HeptaCB (#177)	217	25.5	217 ± 51.0	7
2,2',3,3',5,5',6-HeptaCB (#178)	151	19.2	151 ± 38.4	6
2,2',3,4,4',5,5'-HeptaCB (#180)	2160	182	2160 ± 364	11
2,2',3,4,4',5',6-HeptaCB (#183)	341	38.1	341 ± 76.2	9
2,2',3,4',5,5',6-HeptaCB (#187)	839	105	839 ± 210	9
2,3,3',4,4',5,5'-HeptaCB (#189)	53.4	7.25	53.4 ± 14.5	11
2,2',3,3',4,4',5,5'-OctaCB (#194)	296	32.9	296 ± 65.8	7
2,2',3,3',4,4',5,5',6-NonaCB (#206)	95.1	18.1	95.1 ± 36.2	7
2,2',3,3',4,5,5',6,6'-NonaCB (#208)	28.1	6.46	28.1 ± 12.9	5
DecaCB (#209)	96.2	12.8	96.2 ± 25.6	6
Brominated diphenyl ethers[4]				
2,2',4-TriBDE (#17)	7.21	1.09	7.21 ± 2.18	6
2,4,4'-TriBDE (#28)	39.7	5.28	39.7 ± 10.6	6
2,2',4,4'-TetraBDE (#47)	1490	237	1490 ± 474	9
2,3',4,4'-TetraBDE (#66)	52.6	17.5	52.6 ± 35.0	6
2,2',4,4',5-PentaBDE (#99)	187	24.3	187 ± 48.6	7
2,2',4,4',6-PentaBDE (#100)	359	31.6	359 ± 63.2	7
2,2',4,4',5,5'-HexaBDE (#153)	33.9	5.09	33.9 ± 10.2	7
2,2',4,4',5,6'-HexaBDE (#154)	238	29.6	238 ± 59.2	7

[1] Assigned value as determined by TRIUM Inc. (Canada) using STATISTICA data analysis software analysis of raw interlaboratory study data.
[2] Reference value is the Assigned Value plus or minus two standard deviations. Negative numbers resulting from two standard deviations being greater than the assigned value have no significance.
[3] Number of laboratories providing results for this analyte.
[4] All numbers in parentheses refer to the IUPAC designation for the compound.

ERM-BB350 — Salmon oil - PCBs — 2 g

Compound	Certified value ng/g	Uncertainty ng/kg
2,4,4'-Trichlorobiphenyl (PCB 28)	21.3	1.1
2,2',5,5'-Tetrachlorobiphenyl (PCB 52)	37.4	2.2
2,4,4',5-Tetrachlorobiphenyl (PCB 74)	23	1.9
2,2',4,4',5-Pentachlorobiphenyl (PCB 99)	62	6
2,2',4,5,5'-Pentachlorobiphenyl (PCB 101)	111	5
2,3,3',4,4'-Pentachlorobiphenyl (PCB 105)	25.8	2.1
2,3,3',4',6-Pentachlorobiphenyl (PCB 110)	54.1	2.8
2,3',4,4',5-Pentachlorobiphenyl (PCB 118)	84	4
2,2',3,4,4',5'-Hexachlorobiphenyl (PCB 138)	137	10
2,2',3,4',5',6-Hexachlorobiphenyl (PCB 149)	88	9
2,2',4,4',5,5'-Hexachlorobiphenyl (PCB 153)	220	11
2,3,3',4,4',5-Hexachlorobiphenyl (PCB 156)	20.1	1.3
2,2',3,3',4,5',6'-Heptachlorobiphenyl (PCB 177)	25.8	2
2,2',3,4,4',5,5'-Heptachlorobiphenyl (PCB 180)	67	4
2,2',3,4,4',5',6-Heptachlorobiphenyl (PCB 183)	22.5	1.8
2,2',3,4',5,5',6-Heptachlorobiphenyl (PCB 187)	67	5
2,2',3,3',4,4',5,5'-Octachlorobiphenyl (PCB 194)	23.4	1.5
2,2',3,3',4,4',5,6'-Octachlorobiphenyl (PCB 196)	41	7

Code	Product	Unit
NIST-3274	Botanical oils - Omega-3 and omega-6 fatty acids	4 x 1.2 mL

This Standard Reference Material® (SRM®) is intended primarily for use in validating analytical methods for the determination of fatty acids in botanical oils and similar matrices. This SRM can also be used for quality assurance when assigning values to in-house control materials. A unit of SRM 3274 consists of a total of four ampoules, one each of four seed oils (3274-1 Borage [Borago officinalis], 3274-2 Evening Primrose [Oenothera biennis], 3274-3 Flax [Linium usitatissimum], and 3274-4 Perilla [Perilla frutescens]). Each ampoule contains approximately 1.2 mL of oil under argon.

	Mass fraction (mg/g)			
	3274-1 Borage	3274-2 Evening Primrose	3274-3 Flax	3274-4 Perilla
Octanoic Acid (C8:0) (Caprylic Acid)		(0.053 ± 0.010)		(0.021 ± 0.002)
Decanoic Acid (C10:0) (Capric Acid)				(0.020 ± 0.011)
Dodecanoic Acid (C12:0) (Lauric Acid)			(0.016 ± 0.001)	
Tetradecanoic Acid (C14:0) (Myristic Acid)	(0.62 ± 0.11)	**0.363 ± 0.030**	**0.271 ± 0.008**	(0.206 ± 0.025)
Pentadecanoic Acid (C15:0)	**0.074 ± 0.008**	**0.099 ± 0.011**	**0.151 ± 0.016**	(0.061 ± 0.009)
Hexadecanoic Acid (C16:0) (Palmitic Acid)	**110 ± 12**	**58.2 ± 6.1**	**44.8 ± 5.0**	**56.4 ± 5.5**
(Z)-9-Hexadecenoic Acid (C16:1 n-7) (Palmitoleic Acid)	**1.77 ± 0.14**	**0.402 ± 0.043**	**0.383 ± 0.031**	**0.776 ± 0.081**
Heptadecanoic Acid (C17:0) (Margaric Acid)	(0.500 ± 0.086)	(0.188 ± 0.008)	(0.212 ± 0.011)	(0.159 ± 0.040)
Octadecanoic Acid (C18:0) (Stearic Acid)	(33.1 ± 4.0)	**18.30 ± 0.838**	**30.4 ± 2.4**	**20.9 ± 1.1**
(Z)-9-Octadecenoic Acid (C18:1 n-9) (Oleic Acid)	**148.7 ± 8.7**	**68.9 ± 3.7**	**165.7 ± 6.2**	**166.8 ± 7.8**
(E)-9-Octadecenoic Acid (t-C18:1 n-9) (Elaidic Acid)	(0.117 ± 0.020)			
(Z)-11-Octadecenoic Acid (C18:1 n-7) (Vaccenic Acid)	**5.76 ± 0.18**	**5.95 ± 0.37**	(5.61 ± 0.16)	(7.89 ± 0.22)
(Z,Z)-9,12-Octadecadienoic Acid (C18:2 n-6) (Linoleic Acid)	**374 ± 35**	**742 ± 24**	**171 ± 11**	**160 ± 14**
(Z,Z,Z)-9,12,15-Octadecatrienoic Acid (C18:3 n-3) (α-Linolenic Acid)	(3.45 ± 0.63)	(2.72 ± 0.51)	**579 ± 30**	**629 ± 28**
(Z,Z,Z)-6,9,12-Octadecatrienoic Acid (C18:3 n-6) (γ-Linolenic Acid)	**251 ± 24**	**99.9 ± 4.1**	(1.55 ± 0.25)	(2.08 ± 0.48)
Eicosanoic Acid (C20:0) (Arachidic Acid)	(2.13 ± 0.46)	(2.71 ± 0.37)	(1.04 ± 0.15)	(1.21 ± 0.26)
(Z)-11-Eicosenoic Acid (C20:1 n-9) (Gondoic Acid)		**1.84 ± 0.12**		
(Z,Z,Z,Z)-5,8,11,14-Eicosatetraenoic Acid (C20:4 n-6) (Arachidonic Acid)		(0.022 ± 0.002)	**0.633 ± 0.029**	
Heneicosanoic Acid (C21:0)	(2.36 ± 0.32)	(0.132 ± 0.029)		(0.083 ± 0.004)
Docosanoic Acid (C22:0) (Behenic Acid)	**1.509 ± 0.070**	(0.91 ± 0.25)	(0.62 ± 0.13)	(0.118 ± 0.004)
Tetracosanoic Acid (C24:0) (Lignoceric Acid)	(0.334 ± 0.074)	(0.369 ± 0.060)	(0.308 ± 0.059)	(0.096 ± 0.022)
(Z)-15-Tetracosenoic Acid (C24:1)	**7.80 ± 0.61**			**0.084 ± 0.003**

( ) Indicative values
Certified values in bold

Code	Product	Unit
NIST-3275	Fish oil - Omega-3 and omega-6 fatty acids	6 x 1.2 mL

This Standard Reference Material (SRM®) is intended primarily for validation of methods for determining fatty acids in fish oils and similar materials. This SRM can also be used for quality assurance when assigning values to in-house reference materials. SRM 3275 consists of three individual oils: NIST-3275-1, a concentrate high in docosahexaenoic acid (DHA); NIST-3275-2, an anchovy oil high in DHA and eicosapentaenoic acid (EPA); and NIST-3275-3, a concentrate containing 60 % long-chain omega-3 fatty acids. A unit of NIST-3275 consists of two ampoules of each of the three oils, each ampoule containing approximately 1.2 mL of material.

Certified mass fraction values for fatty acids as fatty acid methyl esters (FAMEs)

	Mass fraction (mg/kg)		
	SRM 3275-1	SRM 3275-2	SRM 3275-3
Dodecanoic acid (C12:0; Lauric acid)			0.95 ± 0.12
Tetradecanoic acid (C14:0; Myristic acid)	1.094 ± 0.053	3.45 ± 0.40	67.9 ± 1.5
Hexadecanoic acid (C16:0; Palmitic acid)	5.25 ± 0.35	8.01 ± 0.44	186.9 ± 9.4
(Z)-9-Hexadecenoic acid (C16:1 n-7) (Palmitoleic acid)	7.43 ± 0.24	5.83 ± 0.45	85.7 ± 3.1
Octadecanoic acid (C18:0; Stearic acid)	4.22 ± 0.13	12.94 ± 0.62	38.0 ± 5.7
(Z)-9-Octadecenoic acid (C18:1 n-9) (Oleic acid)	11.25 ± 0.93	22.1 ± 1.6	112.3 ± 2.6
(Z)-11-Octadecenoic acid (C18:1 n-7) (Vaccenic acid)	5.33 ± 0.35	9.24 ± 0.77	38.5 ± 2.2
ω-6 (Z,Z)-9,12-Octadecadienoic acid (C18:2 n-6) (Linoleic acid)	2.31 ± 0.19	3.00 ± 0.42	13.49 ± 0.45
ω-3 (Z,Z,Z)-9,12,15-Octadecatrienoic acid (C18:3 n-3) (α-Linolenic acid; ALA)		14.99 ± 0.37	9.08 ± 0.22
Eicosanoic acid (C20:0; Arachidic acid)		0.357 ± 0.027	1.14 ± 0.26
(Z)-11-Eicosenoic acid (C20:1 n-9) (Gondoic acid)		6.66 ± 0.69	2.92 ± 0.14
ω-3 (Z,Z,Z,Z,Z)-5,8,11,14,17-Eicosapentaenoic acid (C20:5 n-3; EPA)	113 ± 12	460 ± 34	199.1 ± 7.8
Docosanoic acid (C22:0; Behenic acid)	4.02 ± 0.24	1.396 ± 0.046	0.502 ± 0.047
ω-3 (Z,Z,Z,Z,Z,Z)-4,7,10,13,16,19-Docosahexaenoic acid (C22:6 n-3; DHA)	524 ± 42	267 ± 12	163.5 ± 7.2
(Z)-13-Docosenoic acid (C22:1 n-9; Erucic acid)		3.43 ± 0.32	
(Z,Z,Z,Z,Z,)-7,10,13,16,19-Docosapentaenoic acid (C22:5; DPA)	87.2 ± 6.7	81.5 ± 4.4	37.9 ± 2.9
Tetracosanoic acid (C24:0; Lignoceric acid)		1.41 ± 0.13	

Indicative values for further fatty acids as fatty acid methyl esters.

Code	Product	Unit
NIST-3278	Edible oils - Tocopherols	5 amps.

This Standard Reference Material® (SRM®) is intended primarily for use in validating analytical methods for the determination of tocopherols in edible oils and similar matrices. This SRM can also be used for quality assurance when assigning values to in-house control materials. A unit of NIST-3278 consists of five ampoules of oil each containing approximately 1 mL of material under argon.

Certified mass fraction values for tocopherols in NIST-3278

alpha-Tocopherol	290.1 ± 6.5 µg/g	gamma-Tocopherol	111.5 ± 5.8 µg/g
beta-Tocopherol	11.38 ± 0.52 µg/g	delta-Tocopherol	28.8 ± 1.8 µg/g

Food authenticity and speciation

Code	Product	Unit
LGCQC101-KT	**Peanut allergen in chocolate dessert positive & negative control** The materials are intended for use as quality control materials for analytical methods used in the determination of peanut protein in foods. They are not suitable for establishing method bias. The concentration of peanut protein in the reconstituted chocolate mouse dessert LGCQC1012 is based on the gravimetric preparation data. No peanut protein was added to LGCQC1011, and measurements carried out on the re-constituted matter did not detect peanut / peanut protein at a level of 1 mg/kg or above. Indicative values (Peanut protein) LGCQC1011 (Negative control) <1 mg/kg LGCQC1012 (Positive control) 10 mg/kg	2 x 5 g
BCR-657	**Sugar (glucose) - Carbon-13 isotope ratio** Certified value Paramater — Value — Uncertainty $\delta^{13}C_{VPDB}$ by IRMS ..... 1.076 ‰ ..... 0.004‰	1 g
ERM-AE672	**Glycine - Absolute carbon isotope ratio** Certified values for Glycine-Absolute carbon isotope ratio $n(^{13}C)/n(^{12}C)$ ..... 0.010648 $\delta^{13}C_{VPDB\text{-}LSVEC}$ ..... -42.12 $\delta^{13}C^{1}$	500 mg
NIST-RM 8445	**Spray-Dried Whole Egg for Allergen Detection** This Reference Material (RM) is intended primarily for the use in evaluating test kits for determination of the presence of allergenic egg proteins. The material provides a common matrix to the allergen research community, who may wish to conduct studies using a single broadly available material.	5 g
LGC7220	Horse meat (100%)	10 g
LGC7221	Beef (100%)	10 g
LGC7222	Pork (100%)	10 g
LGC7223	Sheep meat (100%)	10 g
LGC7224	Chicken meat (100%)	10 g
LGC7225	Turkey meat (100%)	10 g
LGC7240	Horse meat (1%) in beef	3 x 2 g
LGC7241	Horse meat (10%) in beef	3 x 2 g
LGC7242	Pork (1%) in beef	3 x 2 g
LGC7243	Pork (10%) in beef	3 x 2 g
LGC7244	Chicken (1%) in sheep	3 x 2 g
LGC7245	Chicken (5%) in sheep	3 x 2 g
LGC7246	1% Turkey meat in sheep meat	3 x 2 g
LGC7247	5% Turkey meat in sheep meat	3 x 2 g
LGC7248	Beef in sheep meat	3 x 2 g
LGC7249	Beef in sheep meat	3 x 2 g
BCR-656	**Ethanol from wine (96 % vol.) - Isotope ratios** Certified values Parameter — Value — Uncertainty $(D/H)_I$ by ^{2}H-NMR ..... 102.84 ppm ..... 0.20 ppm $(D/H)_{II}$ by ^{2}H-NMR ..... 132.07 ppm ..... 0.30 ppm R by ^{2}H-NMR ..... 2.570 ..... 0.005 $\delta^{13}C_{VPDB}$ by IRMS ..... -2.691% ..... 0.007% Alcoholic grade t_D ..... 4.61% ..... 0.05%(1) (1) in w/w volume	25 mL
BCR-658	**Wine (7% vol) - Oxygen-18 isotope ratio** Certified values Parameter — Value — Uncertainty $\delta^{18}O_{VSMOW}$ of water from wine by IRMS .... - 0.719‰ ..... 0.004‰	25 mL

Code	Product	Unit
BCR-660	Wine ethanol - Isotope ratios	450 mL

Certified values

Parameter	Value	Uncertainty
$(D/H)_I$ by ^{2}H-NMR	102.90 ppm	0.16 ppm
$(D/H)_{II}$ by ^{2}H-NMR	131.35 ppm	0.23 ppm
R by ^{2}H-NMR	2.567	0.005
$\delta^{13}C_{VPDB}$ by IRMS	-2.672%	0.009%
$(D/H)_w$ of water (IRMS)	148.68 ppm	0,14 ppm
Alcoholic grade t_D	11.96%	0.06%(1)

(1) in v/v %

Animal feed

Code	Product	Unit
LGC7173	**Poultry feed - Proximates and elements** Assessed values using Statutory Methods* Moisture 12.3 ± 0.3 g/100 g; Oil 4.1 ± 0.7 g/100 g; Ash 6.4 ± 0.6 g/100 g Assessed values using data derived from a variety of methods Moisture 12.0 ± 0.3 g/100 g; Ca 1.44 ± 0.15 g/100 g; K 0.74 ± 0.06 g/100 g Nitrogen 2.56 ± 0.19 g/100 g; Chloride 0.28 ± 0.06 g/100 g; Fe 145 ± 31 mg/kg Oil 4.1 ± 0.7 g/100 g; Mg 0.16 ± 0.02 g/100 g; Mn 131 ± 19 mg/kg Ash 6.5 ± 0.6 g/100 g; P 0.63 ± 0.03 g/100 g; Zn 91 ± 11 mg/kg Crude fibre 4.1 ± 0.7 g/100 g; Na 0.17 ± 0.05 g/100 g *These values have been assigned using only data derived from laboratories reporting analysis according to "EEC method of analysis of the official control of feedingstuffs", as indicated into UK law in "The Feeding Stuffs (Sampling and Analysis) Regulations 1999".	45 g
BCR-115	**Animal feed - Pesticides** Compound / Certified value mg/kg / Uncertainty mg/kg HCB 0.0194 0.0014 beta-HCH 0.023 0.003 gamma-HCH 0.0218 0.0020 Heptachlor 0.019 0.0015 gamma-Chlordane 0.048 0.005 Dieldrin 0.018 0.003 alpha-Endosulfan 0.046 0.004 Endrin 0.046 0.006 2,4'-DDT 0.046 0.005 4,4'-DDE 0.047 0.004	30 g
BCR-375	**Compound feed - Aflatoxin B1 (blank)** Certified value Aflatoxin B1 <1 µg/kg	50 g
BCR-708	**Synthetic dairy feed - Proximates and elements** Property / Certified value / Uncertainty Crude protein 240 g/kg 12 g/kg Crude oils and fats 65 g/kg 8 g/kg Crude fibre 93 g/kg 14 g/kg Crude ash 50 g/kg 3 g/kg Ca 4.8 g/kg 0.5 g/kg Cu 37 mg/kg 4 mg/kg Mg 1.47 g/kg 0.22 g/kg P 4.7 g/kg 0.4 g/kg	40 g
BCR-709	**Synthetic feed for growing pigs feed - Proximates and elements** Property / Certified value / Uncertainty Crude protein 199 g/kg 5 g/kg Crude oils and fats 51 g/kg 14 g/kg Crude fibre 56 g/kg 12 g/kg Crude ash 42 g/kg 4 g/kg Ca 1.05 g/kg 0.16 g/kg Cu 173 mg/kg 25 mg/kg Mg 1.89 g/kg 0.30 g/kg P 5.4 g/kg 0.7 g/kg	40 g
ERM-BE375	**Compound feedingstuff - Aflatoxins (very low level)** ERM-BE376 is a compound feeding stuff mixed from contaminated copra, wheat, barley, soya, maize and a mineral / vitamin premix. Certified values Aflatoxin B1 2.6 ± 0.4 µg/kg; Aflatoxin G1 0.4 ± 0.1 µg/kg Aflatoxin B2 0.20 ± 0.04 µg/kg; Aflatoxin G2 < 0.2 µg/kg	2 x 75 g
ERM-BE376	**COMPOUND FEEDINGSTUFF (high level)** ERM-BE376 is a compound feeding stuff mixed from contaminated copra, wheat, barley, soya, maize and a mineral / vitamin premix. Certified values Aflatoxin B1 12.9 ±1.8 µg/kg; Aflatoxin B2 0.68 ± 0.10 µg/kg; Aflatoxin G1 5.2 ± 0.8 µg/kg	2 x 75 g

Food supplements

Code	Product	Unit
NIST-1544	**Diet composite - Fatty acids and cholesterol** Certified values Cholesterol ..... 0.1483 g/kg Lauric acid ..... 1.31 g/kg Myristic acid ..... 1.01 g/kg Palmitic acid ..... 5.77 g/kg Stearic acid ..... 2.00 g/kg Oleic acid ..... 11.64 g/kg Linoleic acid ..... 6.56 g/kg Indicative values for protein, moisture, total fat, ash, carbohydrate, calories, remaining fatty acids, Ca, K, Na	4 x 15 g
NIST-3280	**Multivitamin/Multielement tablets** A unit of NIST-3280 consists of five bottles, each containing 30 tablets. Each tablet weighs approximately 1.5 g. Certified Concentration Values for Vitamins and Carotenoids α-Tocopherol ..... 21.4 ± 3.5 mg/g Ascorbic acid ..... 42.2 ± 3.7 mg/g Thiamine hydrochloride ..... 1.06 ± 0.12 mg/g Riboflavin ..... 1.32 ± 0.17 mg/g Niacinamide ..... .10 ± 0.23 mg/g Pantothenic acid ..... 7.30 ± 0.96 mg/g Pyridoxine hydrochloride ..... 1.81 ± 0.17 mg/g Folic acid ..... 394 ± 22 µg/g Cyanocobalamin ..... 4.8 ± 1.0 µg/g Biotin ..... 23.4 ± 3.2 µg/g Ergocalciferol ..... 9.13 ± 0.71 µg/g Phylloquinone ..... 22.8 ± 2.2 µg/g Trans-β-carotene ..... 420 ± 100 µg/g Total β-carotene ..... 514 ± 87 µg/g Certified Concentration Values for Selected Elements B ..... 0.141 ± 0.007 mg/g Ca ..... 110.7 ± 5.3 mg/g Cl ..... 53.0 ± 2.3 mg/g Cr ..... 0.0937 ± 0.0027 mg/g Cu ..... 1.40 ± 0.17 mg/g I ..... 0.1327 ± 0.0066 mg/g Fe ..... 12.35 ± 0.91 mg/g Mg ..... 67.8 ± 4.0 mg/g Mn ..... 1.44 ± 0.11 mg/g Mo ..... 0.0707 ± 0.0045 mg/g P ..... 75.7 ± 3.2 mg/g K ..... 53.1 ± 7.0 mg/g Zn ..... 10.15 ± 0.81 mg/g As ..... 0.132 ± 0.044 µg/g Cd ..... 80.15 ± 0.86 µg/g Cr ..... 93.7 ± 2.7 µg/g Pb ..... 0.2727 ± 0.0024 µg/g Mo ..... 70.7 ± 4.5 µg/g Ni ..... 8.43 ± 0.30 µg/g Se ..... 17.42 ± 0.45 µg/g Indicative values for elements, vitamins and carotenoids	150 tablets
NIST-3247	**Ginkgo biloba extract - Flavonoids, terpene , actones, elements** Standard Reference Material NIST-3247 is intended primarily for use in validating analytical methods for the determination of flavonoids, terpene lactones, and toxic elements in Ginkgo biloba extracts and similar matrices. Certified values Quercetin ..... 45.1 ± 4.6 mg/g Kaempferol ..... 40.8 ± 3.0 mg/g Isorhamnetin ..... 10.8 ± 1.3 mg/g Total Aglycones ..... 96.8 ± 8.3 mg/g Ginkgolide ..... 11.6 ± 1.7 mg/g Ginkgolide ..... 5.92 ± 0.45 mg/g Ginkgolide ..... 12.4 ± 1.4 mg/g Ginkgolide ..... 3.9 ± 1.5 mg/g Bilobalide ..... 28.5 ± 2.1 mg/g Total Terpene Lactones ..... 62.4 ± 5.7 mg/g Pb ..... 4.273 ± 0.031 ng/g Indicative values for As and Cd	5 x 1 g
NIST-3248	**Ginkgo-containing tablets - Flavonoids aglycones, terpene lactones** Standard Reference Material NIST-3248 is intended primarily for use in validating analytical methods for the determination of flavonoids, terpene lactones, and toxic elements in ginkgo-containing tablets and similar matrices. Certified values Quercetin ..... 7.56 ± 0.40 Kaempferol ..... 7.19 ± 0.70 Isorhamnetin ..... 1.90 ± 0.22 Total Aglycones ..... 16.6 ± 1.2 Ginkgolide B ..... 1.12 ± 0.20 Ginkgolide C ..... 2.36 ± 0.42 Total Terpene Lactones ..... 11.8 ± 1.4 Pb ..... 0.7753 ± 0.0089 µg/g Indicative values for delected terpene, lactones As, Cd and Hg	5 x 1 g
NIST-3249	**Ginkgo dietary supplement suite - Flavonoids, terpene , actones, elements** Standard Reference Material NIST-3249 consists of two bottles each of three ginkgo-related SRMs®: NIST-3246 Ginkgo biloba (Leaves), NIST-3247 Ginkgo biloba extract, and NIST-3248 Ginkgo–containing tablets. These SRMs are intended primarily for use in validating analytical methods for the determination of flavonoids, terpene lactones, and toxic elements in Ginkgo-containing matrices. These SRMs® can also be used for quality assurance when assigning values to in-house control materials.	2 each

Code	Product	Unit

NIST-3251 — Serenoa repens extract - Phytosterols, fatty acids, ß-carotene, and gamma-tocopherol — 5 x 1 mL

This Standard Reference Material (SRM) is intended primarily for use in validating analytical methods for the determination of phytosterols, fatty acids, β-carotene, and γ-tocopherol in extracts of Serenoa repens (saw palmetto) and similar matrices. This SRM can also be used for quality assurance when assigning values to in-house control materials. A unit of NIST-3251 consists of five ampoules, each containing approximately 1 mL of saw palmetto extract.

Certified concentration values for selected phytosterols in NIST-3251

Phytosterols	Mass Fraction (mg/g)
Campesterol	0.533 ± 0.031
β-Sitosterol	1.666 ± 0.064
Stigmasterol	0.247 ± 0.040

Certified concentration values for selected fatty acids (as triglycerides) in NIST-3251

Fatty acids	Mass Fraction (%)
Octanoic acid (C8:0) (Caprylic acid)	2.677 ± 0.032
Decanoic acid (C10:0) (Capric acid)	2.690 ± 0.055
Dodecanoic acid (C12:0) (Lauric acid)	26.51 ± 0.66
Tridecanoic acid (C13:0)	0.069 ± 0.002
Tetradecanoic acid (C14:0) (Myristicacid)	10.68 ± 0.16
Pentadecanoic acid (C15:0)	0.0518 ± 0.0018
Hexadecanoic acid (C16:0) (Palmitic acid)	8.55 ± 0.20
Heptadecanoic acid (C17:0)	0.0640 ± 0.0024
Octadecanoic acid (C18:0) (Stearic acid)	1.757 ± 0.021
(Z)-9-Octadecenoic acid (C18:1 n-9) (Oleic acid)	34.73 ± 0.43
(Z)-11-Octadecenoic acid (C18:1 n-7) (Vaccenic acid)	0.834 ± 0.020
(Z,Z)-9,12-Octadecadienoic acid (C18:2 n-6) (Linoleic acid)	6.018 ± 0.093
(Z,Z,Z)-9,12,15-Octadecatrienoic acid (C18:3 n-3) (Linolenic acid)	1.248 ± 0.027
Eicosanoic acid (C20:0) (Arachidic acid)	0.0936 ± 0.0033
(Z)-11-Eicosenoic acid (C20:1 n-9) (Gondoic acid)	0.1939 ± 0.0031
Docosanoic acid (C22:0) (Behenic acid)	0.0646 ± 0.0016
Tetracosanoic acid (C24:0)	0.0929 ± 0.0028

Certified concentration values for total β-carotene and γ-tocopherol in NIST-3251

	Mass Fraction (µg/g)
Total β-carotene	46.8 ± 4.6
γ-Tocopherol	280 ± 13

Reference concentration value for cycloartenol, selected fatty acids (as triglycerides), selected free fatty acids, for β-carotene isomers and δ-tocopherol, brassicasterol and lupeol

NIST-3256 — Green tea-containing solid oral dosage form - Catechins, xanthines and toxic elements — 5 x 2.5 g

This Standard Reference Material (SRM®) is intended primarily for use in validating analytical methods for the determination of catechins, xanthines, and toxic elements in solid oral dosage forms containing green tea and in similar matrices. NIST-3256 can also be used for quality assurance when assigning values to in-house control materials. A unit of NIST-3256 consists of five packets, each containing approximately 2.5 g of powdered material.

Certified Mass Fraction Values for Selected Catechins, Gallic Acid, and Xanthines in NIST-3256

	Mass Fraction (mg/g, dry-mass basis)		Mass Fraction (mg/g, dry-mass basis)
(+)-Catechin	2.63 ± 0.18	(–)-Gallocatechin	7.55 ± 0.28
(–)-Epicatechin	12.0 ± 2.6	Gallic acid	13.10 ± 0.49
(–)-Epicatechin gallate	17.1 ± 2.6	Caffeine	70.0 ± 2.6
(–)-Epigallocatechin	30.7 ± 5.7	Theobromine	1.04 ± 0.15
(–)-Epigallocatechin gallate	71.1 ± 6.6		

Certified Mass Fraction Values for Toxic Elements in NIST-3256

	Mass Fraction mg/kg, dry-mass basis)		Mass Fraction mg/kg, dry-mass basis)
Arsenic (As)	0.269 ± 0.019	Lead (Pb)	0.316 ± 0.030
Cadmium (Cd)	0.025 ± 0.002	Mercury (Hg)	0.014 ± 0.002

Indicative values for (–)-Gallocatechin gallate, L-Theanine and Theophylline.

Code	Product	Unit
NIST-3261	Bitter Orange Dietary Supplemental Suite - Alkaloids This Standard Reference Material (SRM®) consists of two packets each of three bitter orange-related SRMs: NIST-3258 Bitter Orange (Fruit), NIST-3259 Bitter Orange Extract, and NIST-3260 Bitter Orange-Containing Solid Oral Dosage Form. These SRMs are intended primarily for use in validating analytical methods for the determination of citrus alkaloids in bitter orange-containing matrices. These SRMs can also be used for quality assurance when assigning values to in-house control materials. The materials in the suite of bitter orange dietary supplement SRMs have been developed to cover a range of natural matrices and analyte levels.	set
NIST-3276	Carrot extract in oil - Carotenoids, tocopherols, selected fatty acids Standard Reference Material NIST-3276 is intended primarily for use in validating analytical methods for the determination of carotenoids, tocopherols, and fatty acids in carrot extract in oil and similar matrices. A unit of NIST-3276 consists of five ampoules of the oil, each containing approximately 1 mL of material under argon. Certified values for Carotenoids and Tocopherols δ-Tocopherol ..... 373 ± 34 µg/g γ-Tocopherol ..... 443 ± 64 µg/g Certified values for selected fatty acids (as Triglycerides) Hexadecanoic Acid (C16:0) ..... 1.36 ± 0.05 % (Palmitic Acid) (Z)-9-Hexadecenoic Acid (C16:1 n-7) ..... 0.0147 ± 0.0014 % (Palmitoleic Acid) Heptadecanoic Acid (C17:0) ..... 0.0213 ± 0.0017 % Octadecanoic Acid (C18:0) ..... 1.14 ± 0.02 % (Stearic Acid) (Z)-9-Octadecenoic Acid (C18:1 n-9) ..... 3.68 ± 0.06 % (Oleic Acid) (Z)-11-Octadecenoic Acid (C18:1 n-7) ..... 0.519 ± 0.012 % (Vaccenic Acid) (Z,Z)-9,12-Octadecadienoic Acid (C18:2 n-6) ..... 6.64 ± 0.11 % (Linoleic Acid) (Z,Z,Z)-9,12,15-Octadecatrienoic Acid (C18:3 n-3) ..... 0.816 ± 0.014 % (Linolenic Acid) Eicosanoic Acid (C20:0) ..... 0.0578 ± 0.0025 % (Arachidic Acid) (Z)-11-Eicosenoic Acid (C20:1 n-9) ..... 0.353 ± 0.006 % (Gondoic Acid) Docosanoic Acid (C22:0) ..... 0.126 ± 0.016 % (Behenic Acid) Tetracosanoic Acid (C24:0) ..... 0.0242 ± 0.0018 % (Lignoceric Acid)	5 amps.

Drinks and alcoholic beverages

Code	Product	Unit

LGC5004 — Lager shandy - Alcohol — 330 mL

This certified reference material for lager shandy is supplied in 150mL units and sealed in aluminium cans.

Certified value

Alcohol ..... 1.02 mL/100 mL (at 20°C)

LGC5100 — Whisky - Congeners — 10 mL

Whisky sourced from a commercial source is available in 10mL unit in amber glass vials using sealed septa with crimped caps.

Certified values

Methanol	8.2 g/100 L	2-Methylbutan-1-ol	19.6 g/100 L
Propan-1-ol	67.4 g/100 L	3-Methylbutan-1-ol	51.4 g/100 L
2-Methylpropan-1-ol	64.9 g/100 L	2+3-Methylbutan-1-ol	70.1g/100 L

Indicative values for acetaldehyde, butan-1-ol, furfural, ethyl acetate

LGC7140 — Soft drink - Colours — 60 mL

Known weights of three food colours were added to a diluted solution of commercial soft drink concentrate.

Certified values

Ponceau 4R (E124)	18.7 mg/L	Tartrazine (E102)	29.9 mg/L
Sunset yellow (E110)	19.6 mg/L		

BCR-651 — Beer - Alcohol (low level) — 10 mL

Certified value

Ethanol ..... 0.505 % (v/v)

BCR-652 — Beer - Alcohol (very low level) — 10 mL

Certified value

Ethanol ..... 0.051 % (v/v)

BCR-653 — Wine - Alcohol (low level) — 10 mL

Certified value

Ethanol ..... 0.539 % (v/v)

BCR-656 — Ethanol from wine (96 % vol.) - Isotope ratios — 25 mL

Certified values

Parameter	Value	Uncertainty
$(D/H)_I$ by ^{2}H-NMR	102.84 ppm	0.20 ppm
$(D/H)_{II}$ by ^{2}H-NMR	132.07 ppm	0.30 ppm
R by ^{2}H-NMR	2.570	0.005
$\delta^{13}C_{VPDB}$ by IRMS	-2.691‰	0.007‰
Alcoholic grade t_D	4.61%	0.05%(1)

(1) in w/w volume

BCR-658 — Wine (7% vol) - Oxygen-18 isotope ratio — 25 mL

Certified values

Parameter	Value	Uncertainty
$\delta^{18}O_{VSMOW}$ of water from wine by IRMS	- 0.719‰	0.004‰

BCR-660 — Wine ethanol - Isotope ratios — 450 mL

Certified values

Parameter	Value	Uncertainty
$(D/H)_I$ by ^{2}H-NMR	102.90 ppm	0.16 ppm
$(D/H)_{II}$ by ^{2}H-NMR	131.35 ppm	0.23 ppm
R by ^{2}H-NMR	2.567	0.005
$\delta^{13}C_{VPDB}$ by IRMS	-2.672‰	0.009‰
$(D/H)_w$ of water (IRMS)	148.68 ppm	0,14 ppm
Alcoholic grade t_D	11.96%	0.06%(1)

(1) in v/v %

ERM-AC404 — Ethanol/water - 5% Ethanol — 25 mL

Certified value

Ethanol ..... 4.98 mL/100 mL at 20°C
Density ..... 990.02 kg/m^3 at 20°C

ERM-AC405 — Ethanol/water - 15% Ethanol — 50 mL

Certified value

Ethanol ..... 14.99 mL/100mL at 20^{0}C
Density ..... 977.94 kg/m^3 at 20^{0}C

Code	Product	Unit
ERM-AC406	Ethanol/water - 40% Ethanol Certified value Ethanol.....39.98 mL/100 mL at 20°C Density.....947.01 kg/m^3 at 20°C	25 mL
ERM-AC407	Ethanol/water - 70% Ethanol Certified value Ethanol.....70.09 mL/100mL at 20^{0}C Density..... 884.27 kg/m^3 at 20^{0}C ABV:alcohol by volume	25 mL
ERM-AC410	Ethanol/water - 40% Ethanol Certified value Ethanol.....40.08 mL/100mL at 20^{0}C Density..... 946.86 kg/m^3 at 20^{0}C ABV:alcohol by volume	50 mL
ERM-BA001	Wine - Alcohol (5%) Certified value at 20 ^{O}C ABV (alcohol by volume) Alcoholic strength (% ABV) 5.37	250 mL
ERM-BA002	Wine - Alcohol (10%) Certified value at 20 ^{O}C ABV (alcohol by volume) Alcoholic strength (% ABV) 10.12	250 mL
ERM-BA003	Wine - Alcohol (15%) Certified value Alcohol ..... 14.14 ± 0.10 % (at 20°C)	250 mL
ERM-BA005	Lager - 5% ABV Alcohol ..... 5.07 mL/100 mL (at 20°C)	330 mL
ERM-BA006	Brandy - 40% ABV European Reference Material ERM-BA006 is a commercial brandy available in 50mL portions contained in amber glass vials fitted with 20mm bromo-butyl stoppers and crimp caps. Certified values Apparent alcoholic strength.....37.83 % alcohol by volume, ABV Actual alcoholic strength .....40.12 % alcohol by volume, ABV Apparent density in air of the obscured spirit..... 950.38 kg/m^3	50 mL
ERM-BD011	Orange juice This certified reference material is intended for use in the development, validation or quality control of analytical methods for the determination of degrees Brix or Refractive Index of sugar solutions and food extracts. Certified values Degrees Brix..... 1.26 Refractive index 1.3348	3 mL
ERM-BD013	Orange juice This certified reference material is intended for use in the development, validation or quality control of analytical methods for the determination of degrees Brix or Refractive Index of sugar solutions and food extracts. Certified values Degrees Brix..... 22.07 Refractive index 1.3673	3 mL
ERM-BD014	Orange juice This certified reference material is intended for use in the development, validation or quality control of analytical methods for the determination of degrees Brix or Refractive Index of sugar solutions and food extracts. Certified values Degrees Brix..... 55.55 Refractive index 1.4320	3 mL
ERM-BD015	Orange juice This certified reference material is intended for use in the development, validation or quality control of analytical methods for the determination of degrees Brix or Refractive Index of sugar solutions and food extracts. Certified values Degrees Brix..... 64.73 Refractive index 1.4529	3 mL
ERM-BD476	Red wine - Ochratoxin A (OTA) Certfied value Ochratoxin A....0.52 ± 0.11 µg/L	50 mL

Code	Product	Unit
NIST-3282	Low-calorie cranberry juice cocktail - Organic acids, Trace elements	5 x 1.2 mL

A unit of NIST-3282 consists of five ampoules, each containing approximately 1.2 mL of liquid.

Certified mass fraction values for organic acids

Citric acid	3.221 ± 0.053 mg/g	Quinic acid	2.672 ± 0.048 mg/g
Malic acid	2.133 ± 0.042 mg/g		

Certified mass fraction values for elements

Calcium	26.3 ± 1.6 mg/kg	Manganese	0.493 ±0.016 mg/kg
Copper	0.23 ± 0.06 mg/kg	Potassium	247 ± 12 mg/kg
Magnesium	12.97 ± 0.84 mg/kg	Sodium	201 ± 20 mg/kg

Indicative values for organic acids, anions, trace elements and sugars

Processed food

Code	Product	Unit
LGC7016	Chocolate confectionery	15 g

	Assessed values g/100g	Uncertainty g/100g
Lactose	7.06	0.96
Sucrose	46.5	2.3
Total fat	29.64	0.34
Butyric acid in fat	0.677	0.071
Nitrogen	1.274	0.024

LGC7017	Sugar confectionery - Sugars	15 g

A commercial supply of sugar confectionery, ground and supplied as 15g units contained in 30ml amber glass bottle with tamper evident caps.

Assessed values

Glucose	9.7 g/100 g	Sucrose	52.6 g/100 g
Fructose	2.3 g/100 g	Maltose	4.2 g/100 g

LGC7103	Sweet digestive biscuit - Proximates and elements	48 g

Assessed values

Moisture	2.88 g/100g	Sucrose	13.89 g/100 g	Mg	254 mg/kg
Nitrogen	1.073 g/100 g	Chloride	0.302 g/100 g	P	900 mg/kg
Total fat	21.17 g/100 g	Na	5010 mg/kg	Mn	5.49 mg/kg
Ash at 550°C	1.599 g/100 g	K	1580 mg/kg	Zn	6.41 mg/kg

Indicative values for Glucose, Fructose, Starch, Ca, Cu and Fe

LGC7107	Madeira cake - Proximates	160 g

Lemon Madeira cakes were prepared by a UK food company. Each cake, weighing approx. 160 g, was sealed in a can.

Assessed values

Moisture	25.9 g/100 g	Total fat	13.4 g/100 g	Sucrose	28.1 g/100 g
Nitrogen	0.66 g/100 g	Ash	1.76 g/100 g	Lactose	0.9 g/100 g

Indicative value for starch content

LGC7111	Potato powder - Sulfur dioxide - (3 months expiry from shipment)	110 g

Assessed value

Total sulfur dioxide ..... 212 ± 27 mg/kg

BCR-122	Margarine - Vitamins	200 g

Certified values

D_3 (cholecalciferol) ..... 0.125 mg/kg

E (tocopherol) ..... 241 mg/kg

BCR-191	Brown bread - Trace elements	40 g

Certified values

Cd	28.4 µg/kg	Fe	40.7 mg/kg	Pb	187 µg/kg
Cu	2.63 mg/kg	Mn	20.3 mg/kg	Zn	19.5 mg/kg

Indicative values for Ca, Cl, Hg, K, Mg, Na, Ni, P, Se

BCR-262R	Defatted peanut meal (blank) - Aflatoxin B1	100 g

Certified value

Aflatoxin B1 ..... <3 µg/kg

BCR-263R	Defatted peanut meal - Aflatoxin B1, B2 and G1	100 g

Certified values

Aflatoxin B1	17.1 ± 2.4 µg/kg	Aflatoxin B2	3.0 ± 0.4 µg/kg	Aflatoxin B3	3.0 ± 0.5 µg/kg

BCR-264	Defatted peanut meal (high level) - Aflatoxin B1	150 g

Certified value

Aflatoxin B1 ..... 206 µg/kg

BCR-385R	Peanut butter - Aflatoxins (low level)	100 g

Certified values

Aflatoxin B1	1.77 ± 0.30 µg/kg	Aflatoxin G2	0.30 ± 0.12 µg/kg
Aflatoxin B2	0.48 ± 0.08 µg/kg	Sum of Aflatoxin B1, B2, G1, G2	3.5 ± 0.5 µg/kg
Aflatoxin G1	0.90 ± 0.4 µg/kg		

BCR-401R	Peanut butter (blank) - Aflatoxins	100 g

Certified values

Aflatoxin B1	<0.2 µg/kg	Aflatoxin G1	<0.2 µg/kg
Aflatoxin B2	<0.2 µg/kg	Aflatoxin G2	<0.2 µg/kg

Code	Product	Unit
BCR-644	Artificial foodstuff - Free sugars and starch/glucose Sugar — Certified value (Mass fraction on dry mass basis (g/100 g)) — Uncertainty (g/100 g) Fructose 16.2 1.1 Sucrose 10.81 0.25 Lactose 15.85 0.29 Starch/glucose 35.1 1.2	50 g
BCR-645	Artificial foodstuff - Free sugars and starch/glucose Sugar — Certified value (Mass fraction on dry mass basis (g/100 g)) — Uncertainty (g/100 g) Sucrose 26.2 0.8 Lactose 27.8 0.6 Starch/glucose 25.2 0.9	50 g
ERM-BC084	Tomato paste - Contaminant metals Certified values Cd 0.112 mg/kg; Pb 0.316 mg/kg; Sn 225 mg/kg	50 g
ERM-BD272	Crispbread - Acrylamide Certified value Acrylamide 0.98 ± 0.09 mg/kg	68 g
ERM-BD272-274	Crispbread - Acrylamide; Rusk - Acrylamide Set of ERM-BD272 and ERM-BD274	set
ERM-BD273	Toasted bread - Acrylamide The matrix material ERM-BD273, consists of 30 g of toasted bread powder of particle size smaller than 500 µm, stored in amber glass bottles under inert atmosphere and stored at a temperature of - 20 ºC. Certified value Acrylamide 425 ng/g	vial
ERM-BD274	Rusk - Acrylamide Certified value Acrylamide 47 ± 7 µg/kg	48 g
ERM-BD518	Bran breakfast cereal - Dietary fibre Certified using five different methods of dietary fibre analysis Certified values AOAC 1990 30.2 g/100 g; AOAC 1992 MES-TRIS 30.5 g/100 g Englyst (GC) 24.1 g/100 g; Englyst (colorimetry) 25.0 g/100 g Uppsala 27.6 g/100 g	25 g
IRMM-801	Cocoa butter - Triglyceride (TG) Certified values Triglyceride — Relative mass fraction g TG/100 g total TG — Uncertainty g TG/100 g total TG 1,3-Dipalmitoyl-2-oleyl-glycero 18.14 0.26 1-Palmitoyl-2-oleoyl-3-stearoyl-glycerol 44.68 0.30 1,2-Dioleoyl-3-palmitoyl-glycerol 2.26 0.16 1,3-Distearoyl-2-oleoyl-glycerol 31.63 0.29 1,2-Dioleoyl-3-stearoyl-glycerol 3.29 0.17	Amp.
NIST-1548a	Typical diet - Trace elements A unit of NIST-1548a consists of two bottles, each containing approximately 6.5 g of the freeze-dried homogenate of mixed diet foods. Certified values Al 72.4 mg/kg; Cu 2.32 mg/kg; Ni 0.369 mg/kg As 0.20 mg/kg; Fe 35.3 mg/kg; P 3486 mg/kg Ca 1967 mg/kg; I 0.759 mg/kg; S 1928 mg/kg Cd 0.035 mg/kg; Mg 580 mg/kg; Se 0.245 mg/kg Cl 12078 mg/kg; Mn 5.75 mg/kg; Sn 17.2 mg/kg Cs 0.0098 mg/kg; Na 8132 mg/kg; Zn 24.6 mg/kg Indicative values for Ash, carbohydrate, fat, N, protein, dietary fibre, calories, B, Ba, Br, Co, Hg, Mo, Sb, Sc, Si, Sr, Ti	set (2)

Code	Product	Unit
NIST-2383A	Baby food composite - Carotenoids and vitamins	4 x 70 g

Certified mass fractions for selected water-soluble vitamins

Free Thiamine chloride hydrochloride	0.976 ± 0.014 mg/k
Riboflavin	0.56 ± 0.15 mg/kg
Niacin	1.79 ± 0.04 mg/kg
Niacinamide	3.59 ± 0.06 mg/kg
Free Vitamin B (as Niacinamide)	5.36 ± 0.10 mg/kg
Pantothenic acid	1.64 ± 0.02 mg/kg
Pyridoxine hydrochloride	0.063 ± 0.002 mg/kg
Pyridoxamine dihydrochloride	0.228 ± 0.003 mg/kg
Free Vitamin B_6	0.330 ± 0.004 mg/kg

Certified mass fraction values for selected elements

Barium	0.278 ± 0.020 mg/kg
Calcium	342.6 ± 5.0 mg/kg
Cobalt	0.048 ± 0.005 mg/kg
Copper	0.758 ± 0.082 mg/kg
Iron	4.42 ± 0.51 mg/kg
Magnesium	212.2 ± 0.51 mg/kg
Manganese	0.963 ± 0.064 mg/kg
Phosphorus	453 ± 11 mg/kg
Potassium	2910 ± 220 mg/kg
Sodium	195 ± 29 mg/kg
Strontium	4.445± 0.047 mg/kg
Zinc	2.22 ± 0.18 mg/kg

Reference values for other vitamins, proximates, minerals and trace elements.

NIST-2384	Baking chocolate - Fat, fatty acids	5 x 91 g

Standard Reference Material (SRM®) 2384 is intended primarily for use in validating methods for determining proximates, fatty acids, calories, vitamins, elements, catechins, caffeine, theobromine, and acrylamide in baking chocolate and similar matrices.

Certified values for fat

Fat (Extractable)	51.4 ± 1.1 %	Fat (Sum of fatty acids)	50.3 ± 1.1 %

Certified values for selected fatty acids

	Mass fraction as the Triglyceride	Mass fraction as the Fatty acid
Tetradecanoic acid (C14:0) (Myristic acid)	0.080 ± 0.005%	0.076 ± 0.005%
Hexadecanoic acid (C16:0) (Palmitic acid)	13.06 ± 0.27%	12.44 ± 0.26%
(Z)-9-Hexadecenoic acid (C16:1) (Palmitoleic acid)	0.133 ± 0.007%	0.127 ± 0.007
Octadecanoic acid (C18:0) (Stearic acid)	18.01 ± 0.40%	17.24 ± 0.38%
(Z)-9-Octadecenoic acid (C18:1) (Oleic acid)	16.44 ± 0.36%	15.73 ± 0.35%
(Z)-11-Octadecenoic acid (C18:1) (Vaccenic acid)	0.180 ± 0.018%	0.172 ± 0.017%
(Z,Z)-9,12-Octadecadienoic acid (C18:2) (Linoleic acid)	1.524 ± 0.048%	1.458 ± 0.046%
(Z,Z,Z)-9,12,15-Octadecatrienoic acid (C18:3) (Linolenic acid)	0.097 ± 0.006	0.093 ± 0.006
Eicosanoic acid (C20:0) (Arachidic acid)	0.521 ± 0.013%	0.501 ± 0.012%
Docosanoic acid (C22:0) (Behenic acid)	0.091 ± 0.006%	0.088 ± 0.006%
Tetracosanoic acid (C24:0) (Lignoceric acid)	0.050 ± 0.002%	0.050 ± 0.002%

Certified values for selected additional analytes

Caffeine	1 060 ± 50	(+)-Catechin	245 ± 51 mg/kg
Theobromine	11600 ± 1 100 mg/kg	(–)-Epicatechin	1220 ± 240 mg/kg
Calcium	840 ± 74 mg/kg	Catechin monomers	1490 ± 220 mg/kg
Iron	132 ± 11 mg/kg		

Reference values for proximates and caloric content, fatty acids, trace elements, vitamins and other analytes.

Code	Product	Unit
NIST-2387	Peanut butter - Fat, fatty acids, trace elements and tocopherols	3 x 170 g

This Standard Reference Material® (SRM®) is intended primarily for use in validating methods for determining proximates, fatty acids, calories, vitamins, elements, amino acids, and aflatoxins in peanut butter and similar matrices.

Certified concentrations for fat and selected fatty acids

	Mass fraction (%)
Fat (extractable)	51.6 ± 1.4
Fat (sum of fatty acids)	49.8 ± 1.9
Saturated fat	10.4 ± 0.2
Monounsaturated fat	24.4 ± 0.9
Polyunsaturated fat	13.2 ± 0.4

	Mass fraction (%) (as the triglyceride)	Mass fraction (%) (as the fatty acid)
Tetradecanoic acid (C14:0) (Myristic acid)	0.025 ± 0.002	0.024 ± 0.002
Hexadecanoic acid (C16:0) (Palmitic acid)	5.18 ± 0.15	4.94 ± 0.15
(Z)-9-Hexadecenoic acid (C16:1 n-7) (Palmitoleic acid)	0.046 ± 0.011	0.044 ± 0.010
Octadecanoic acid (C18:0) (Stearic acid)	2.23 ± 0.08	2.13 ± 0.08
(Z)-9-Octadecenoic acid (C18:1 n-9) (Oleic acid)	24.43 ± 0.94	23.38 ± 0.90
(Z)-11-Octadecenoic acid (C18:1 n-7) (Vaccenic acid)	0.266 ± 0.017	0.255 ± 0.016
(Z,Z)-9,12-Octadecadienoic acid (C18:2 n-6) (Linoleic acid)	13.75 ± 0.43	13.15 ± 0.41
(Z,Z,Z)-9,12,15-Octadecatrienoic acid (C18:3 n-3) (Linolenic acid)	0.031 ± 0.001	0.030 ± 0.001
Eicosanoic acid (C20:0) (Arachidic acid)	0.739 ± 0.030	0.710 ± 0.029
(Z)-11-Eicosenoic acid (C20:1 n-9) (Gondoic acid)	0.669 ± 0.032	0.643 ± 0.031
Docosanoic acid (C22:0) (Behenic acid)	1.88 ± 0.08	1.81 ± 0.08
Tetracosanoic acid (C24:0)	0.808 ± 0.045	0.781 ± 0.044

Certified concentration values for elements and tocopherol

	Mass fraction (mg/kg)		Mass fraction (mg/kg)
Ca	411 ± 18	K	6070 ± 200
Cu	4.93 ± 0.15	Na	4890 ± 140
fe	16.4 ± 0.8	Zn	26.3 ± 1.1
Mg	1680 ± 70	δ -Tocopherol	10 ± 3
Mn	16.0 ± 0.6	γ - + β -Tocopherol	100 ± 19
P	3378 ± 92	α -Tocopherol	108 ± 11

Reference values for proximates, caloric content, fatty acids, amino acids, water-soluble vitamins, aflatoxins and acrylamide

Code	Product	Unit
NIST-3233	Fortified Breakfast Cereal	60 g

This Standard Reference Material (SRM) is intended primarily for validation of methods for determining proximates, sugars, dietary fiber, vitamins, elements, and amino acids in fortified breakfast cereals and similar materials. This SRM can also be used for quality assurance when assigning values to in-house reference materials.

The SRM is a wheat-based fortified breakfast cereal prepared by a commercial manufacturer. A unit of SRM 3233 consists of one bottle containing approximately 60 g of material and sealed inside an aluminized pouch.

Certified Mass Fraction Values (Dry-Mass Basis) for Selected Elements

Mass Fraction	(mg/kg)
Barium	2.766 ± 0.033
Cadmium	0.0819 ± 0.0020
Calcium	36910 ± 920
Copper	3.97 ± 0.28
Iron	766 ± 36
Magnesium	1093 ± 37
Manganese	33.1 ± 1.1
Phosphorus	2592 ± 68
Potassium	3060 ± 140
Sodium	6830 ± 120
Strontium	8.34 ± 0.17
Zinc	628 ± 16

Certified Mass Fraction Values (Dry-Mass Basis) for Selected Vitamins

Mass Fraction	(mg/kg)
Thiamine (Vitamin B1)	60.2 ± 9.4
Riboflavin (Vitamin B2)	76 ± 2
Niacinamide	799 ± 27
Total Vitamin B3 as Niacinamide	822 ± 39
Pantothenic Acid	540 ± 40
Pyridoxine	78.0 ± 4.7
Total Vitamin B6 as Pydridoxine	81.9 ± 9.0
Folic Acid	15.1 ± 1.2
Total α-Tocopherol (Vitamin E)	1350 ± 220

Reference values for cobalt, molybdenum, vanadium, ascorbic acid, niacin, pyridoxal, Cyanocobalamin (Vitamin B12), Proximates, Sugars, and Calories.

Code	Product	Unit
NRCSELM-1	Selenium enriched yeast	8 g

Certified values

Total selenium	2059 ± 64 mg/kg	Methionine	5758 ± 277 mg/kg
Selenomethionine	3431 ± 157 mg/kg		

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Ireland
Tel: +44 (0)20 8943 8480
Email: uksales@lgcstandards.com

Italy
Tel: +39 02 2247 6412
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Middle East
Tel: +49 (0)281 9887 0
Email: de@lgcstandards.com

Netherlands
Tel: +31 (0)643 775 422
Email: nl@lgcstandards.com

Poland
Tel: +48 22 751 31 40
Email: pl@lgcstandards.com

Romania
Tel: +40 364 116890
Email: ro@lgcstandards.com

Russia
Tel: +7 812 7770488
Email: ru@lgcgroup.com

Scandinavia
Tel: +49 (0)281 9887 0
Email: de@lgcstandards.com

South Africa
Tel: +27 (0)11 466 4321
Email: info@industrialanalytical.co.za

Spain
Tel: +34 (0)93 308 4181
Email: es@lgcstandards.com

Turkey
Tel: +90 216 360 0870
Email: tur@lgcstandards.com

United Kingdom
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