ERA
A Waters Company

Reference Materials

▪ Certificate of Analysis ▪

Product: Low-Level PAHs in Soil
Catalog Number: 722
Lot No. D091-722
Certificate Issue Date: November 30, 2015
Expiration Date: June 04, 2018
Revision Number: Original

CERTIFICATION

Parameter	Certified Value[1]	Uncertainty[2]	QC Performance Acceptance Limits[3]	PT Performance Acceptance Limits[4]
	µg/kg	%	µg/kg	µg/kg
Acenaphthene	599	0.786	180 - 617	88.5 - 736
Acenaphthylene	637	0.642	168 - 637	63.7 - 856
Anthracene	360	4.65	136 - 360	52.9 - 502
Benzo(a)anthracene	185	9.08	82.9 - 200	55.6 - 235
Benzo(b)fluoranthene	198	24.2	93.9 - 230	64.9 - 237
Benzo(k)fluoranthene	156	22.2	72.5 - 173	43.3 - 191
Benzo(g,h,i)perylene	202	11.9	82.6 - 236	20.2 - 301
Benzo(a)pyrene	76.0	18.3	28.0 - 76.0	9.76 - 97.4
Chrysene	371	13.1	178 - 438	83.4 - 519
Dibenz(a,h)anthracene	119	17.9	55.7 - 139	25.1 - 163
Fluoranthene	788	7.06	381 - 906	229 - 1010
Fluorene	432	1.02	153 - 458	86.1 - 545
Indeno(1,2,3-cd)pyrene	183	16.5	81.6 - 210	28.8 - 241
Naphthalene	872	1.02	191 - 916	87.2 - 1060
Phenanthrene	966	1.61	439 - 1100	243 - 1120
Pyrene	436	12.4	190 - 514	116 - 543

ANALYTICAL VERIFICATION

Parameter	Certified Value[1]	Proficiency Testing Study			NIST Traceability	
		Mean	Recovery[5]	n	SRM Number	Recovery
	µg/kg	µg/kg	%			%
Acenaphthene	599	412	68.9	30	-	-

ISO/IEC Guide 34:2009 ACCREDITED Reference Material Producer Certificate No. 1537.02
ISO/IEC 17025:2005 ACCREDITED Chemical Testing Laboratory Certificate No. 1398.01

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Parameter	Certified Value[1]	Proficiency Testing Study			NIST Traceability	
		Mean	Recovery[5]	n	SRM Number	Recovery
	µg/kg	µg/kg	%			%
Acenaphthylene	637	431	67.7	28	-	-
Anthracene	360	278	77.1	30	-	-
Benzo(a)anthracene	185	145	78.5	30	-	-
Benzo(b)fluoranthene	198	151	76.4	30	-	-
Benzo(k)fluoranthene	156	117	75.0	30	-	-
Benzo(g,h,i)perylene	202	160	79.1	30	-	-
Benzo(a)pyrene	76.0	53.6	70.5	30	-	-
Chrysene	371	301	81.2	29	-	-
Dibenz(a,h)anthracene	119	93.8	78.9	29	-	-
Fluoranthene	788	618	78.4	29	-	-
Fluorene	432	316	73.1	30	-	-
Indeno(1,2,3-cd)pyrene	183	135	73.6	30	-	-
Naphthalene	872	541	62.0	29	-	-
Phenanthrene	966	682	70.6	29	-	-
Pyrene	436	330	75.6	29	-	-

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1. The **Certified Values** are the actual "made-to" concentrations confirmed by ERA analytical verification. The certified values are monitored and purchasers will be notified of any significant changes resulting in recertification or withdrawal of this certified reference material during the period of validity of this certificate.

2. The **Uncertainty** is the total propagated uncertainty at the 95% confidence interval. The uncertainty is based on the preparation and internal analytical verification of the product by ERA, multiplied by a coverage factor. The uncertainty applies to the product as supplied and does not take into account any required or optional dilution and/or preparations the laboratory may perform while using this product.

3. The **QC Performance Acceptance Limits (QC PALs™)**are based on actual historical data collected in ERA's Proficiency Testing program. The QC PALs™ reflect any inherent biases in the methods used to establish the limits and closely approximate a 95% confidence interval of the performance that experienced laboratories should achieve using accepted environmental methods. Use the QC PALs™ to realistically evaluate your performance against your peers.

4. The **PT Performance Acceptance Limits (PT PALs™)** are calculated using the regression equations and fixed acceptance criteria specified in the NELAC proficiency testing requirements. Use the PT PALs™ when analyzing this QC standard alongside USEPA and NELAC compliant PT standards. Please note that many PT study acceptance limits are concentration dependent (some non-linearly) and, therefore, the acceptance limits of this QC standard and any PT standard may differ relative to their difference in concentrations.

5. The **PT Data/Traceability** data include the mean value, percent recovery and number of data points reported by the laboratories in our Proficiency Testing study compared to the Certified Values. In addition, where NIST Standard Reference Materials (SRMs) are available, each analyte has been analytically traced to the NIST SRM listed. This product is traceable to the lot numbers of its starting materials. All gravimetric and volumetric measurements related to its manufacture are traceable to NIST through an unbroken chain of comparisons.
Traceability Recovery (%) = [(% recovery certified standard)/(% recovery NIST SRM)]*100
The traceability data shown were compiled by analyzing the ERA standards or their associated stock solutions against the applicable NIST SRMs.

6. For additional information on this product such as intended use, instructions for use, level of homogeneity, and safety information, please refer to the provided Instruction Sheet

If you have any questions or need technical assistance, please call ERA technical assistance at 1-800-372-0122 or send an email to info@eraqc.com.

Certifying Officer

Brian Miller

Brian Miller

Quality Officer

Patrick Larson

Pat Larson

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