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XrM33 Participating Laboratories

Lab Code	Lab Name	Matrix Code
ADFC99	Abu Dhabi Quality and Conformity Council-Central Testing Lab	XrM
CMRC01	Carlsbad Environmental Monitoring and Research Center	XrM
CRCE99	Centre for Radiation, Chemical and Environmental Hazards	XrM
DINL99	Departamento Ingeniería Nuclear y Mecánica de Fluidos	XrM
DPHE01	Colorado Dept. of Public Health & Env. / Laboratory Services Div.	XrM
EULC01	EnergySolutions, LLC	XrM
FDHE01	Florida Dept of Health Environmental Laboratory	XrM
GENE01	GEL Laboratories, LLC	XrM
HECR01	SC Dept. Health and Environmental Control Radiological Laboratory	XrM
JAEC99	Research Laboratories and Information Directorate	XrM
LANL01	Los Alamos National Laboratory	XrM
LDRA99	Laboratori de Radiologia Ambiental-Universitat de Barcelona	XrM
LERL99	LARUEX Environmental Radioactivity Laboratory	XrM
MAHP59	Materials Assessment and Health Physics Group	XrM
NARL01	National Analytical Radiation Environmental Laboratory	XrM
NARL02	USEPA - NAREL - MERL	XrM
NRLL99	Environmental Radioactivity - National Centre for Radiation Science	XrM
ODHL01	Ohio Department of Health Laboratory	XrM
ORIS01	ORISE/IEAV	XrM
QUAN01	TestAmerica St. Louis	XrM
RAVR99	Radiactividad Ambiental y Vigilancia Radiologica	XrM
RSIR99	Instituto de Radioprotecao e Dosimetria - IRD/CNEN	XrM
SANC99	RadioAnalysis, South Africa Nuclear Energy Corp.	XrM
SEML01	SRS Environmental Monitoring Laboratory	XrM
SRPD01	Sandia National Laboratories, Radiation Protection Sample Diagnostics	XrM
UPVL99	Lab Radiactividad Ambiental. Univ. Politecnica Valencia	XrM
ZIOS99	ZVD Institute of Occupational Safety	XrM

Laboratories Not Reporting XrM33

Lab Code	Lab Name	Matrix Code
ANTE01	ALS Environmental - Fort Collins, CO	XrM
ASUK99	NAS Radiochemistry Group	XrM
ERCL01	Washington State Public Health Laboratories	XrM
HPAC99	PHE, CRCE Glasgow	XrM
IAEA99	International Atomic Energy Agency	XrM
JLNN01	Jefferson Laboratory	XrM
MART03	Radioactive Material Analysis Laboratory	XrM
QUAN03	TestAmerica Laboratories - Richland	XrM
SAVA01	SAVANNAH RIVER NUCLEAR SOLUTIONS (SRNS)	XrM
USED99	National Center for Nuclear Energy, Sciences and Techniques	XrM
WEST04	PACE ANALYTICAL SERVICES, PITTSBURGH	XrM

MAPEP Mixed Analyte Performance Evaluation Program

Study Reference Values

MAPEP-15-XrM33

Radiological Reference Date: 08/01/2015

Analyte	Ref Value	Ref Unc
Mass	Units: (ug/sample)	
Uranium-235	0.0314	0.0006
Uranium-238	9.4	0.3
Uranium-Total	9.5	0.3

Analyte	Ref Value	Ref Unc
Radiological	Units: (Bq/sample)	
Americium-241	0.077	0.003
Cesium-134	1.37	0.04
Cesium-137	2.01	0.05
Cobalt-57	2.43	0.07
Cobalt-60	1.56	0.06
Curium-244	0.105	0.003
Iridium-192	4.76	0.15
Manganese-54	1.64	0.05
Plutonium-238	0.098	0.003
Plutonium-239/240	0.077	0.003
Strontium-90	1.19	0.04
Technetium-99	1.11	0.03
Thorium-228	0.0155	0.0014
Thorium-230	0.0272	0.0018
Thorium-232	0.0161	0.0018
Uranium-234/233	0.038	0.002
Uranium-238	0.117	0.004
Zinc-65	1.15	0.04

The XrM33 is a concrete sample matrix.

MAPEP Mixed Analyte Performance Evaluation Program

Sample Statistical Summary

MAPEP-15-XrM33

Radiological Reference Date: 08/01/2015

Analyte	T(1)	Grand(2) Mean	Std Dev	Ref Value	Ref Unc
Mass				Units: (ug/sample)	
Uranium-235	1			0.0314	0.0006
Uranium-238	1			9.4	0.3
Uranium-Total	2			9.5	0.3

Analyte	T(1)	Grand(2) Mean	Std Dev	Ref Value	Ref Unc
Radiological				Units: (Bq/sample)	
Americium-241	19	0.073	0.009	0.077	0.003
Cesium-134	26	1.36	0.18	1.37	0.04
Cesium-137	26	2.04	0.21	2.01	0.05
Cobalt-57	26	2.34	0.27	2.43	0.07
Cobalt-60	26	1.54	0.14	1.56	0.06
Curium-244	8	0.104	0.011	0.105	0.003
Iridium-192	16	4.32	0.55	4.76	0.15
Manganese-54	25	1.66	0.16	1.64	0.05
Plutonium-238	11	0.096	0.008	0.098	0.003
Plutonium-239/240	11	0.078	0.005	0.077	0.003
Strontium-90	12	1.08	0.11	1.19	0.04
Technetium-99	3			1.11	0.03
Thorium-228	4			0.0155	0.0014
Thorium-230	6			0.0272	0.0018
Thorium-232	5			0.0161	0.0018
Uranium-234/233	12	0.037	0.004	0.038	0.002
Uranium-238	13	0.116	0.007	0.117	0.004
Zinc-65	24	1.17	0.16	1.15	0.04

Note: (1) T = Total number of laboratories reporting analyte.
(2) Mean excludes values derived as total metals and values outside of a bias range of +/- 30%.

The XrM33 is a concrete sample matrix.

Mixed Analyte Performance Evaluation Program

Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-15-XrM33
(ADFC99) Abu Dhabi Quality and Conformity Council-Central Testing Lab
Radiation Lab
Abu Dhabi, - -

Radiological

Sample ID	Nuclide	Known Activity	Expt'l Activity	Bias (%)
MAPEP-15-XrM33	Am-241	0.077 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Cs-134	1.37 +/- 0.04 Bq/sample	1.46 +/- 0.18 Bq/sample	6.6
MAPEP-15-XrM33	Cs-137	2.01 +/- 0.05 Bq/sample	1.75 +/- 0.23 Bq/sample	-12.9
MAPEP-15-XrM33	Co-57	2.43 +/- 0.07 Bq/sample	1.86 +/- 0.24 Bq/sample	-23.5
MAPEP-15-XrM33	Co-60	1.56 +/- 0.06 Bq/sample	1.44 +/- 0.19 Bq/sample	-7.7
MAPEP-15-XrM33	Cm-244	0.105 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Ir-192	4.76 +/- 0.15 Bq/sample		
MAPEP-15-XrM33	Mn-54	1.64 +/- 0.05 Bq/sample	1.2 +/- 0.15 Bq/sample	-26.8
MAPEP-15-XrM33	Pu-238	0.098 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Pu-239	0.077 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Sr-90	1.19 +/- 0.04 Bq/sample		
MAPEP-15-XrM33	Tc-99	1.11 +/- 0.03 Bq/sample		
MAPEP-15-XrM33	Th-228	0.0155 +/- 0.0014 Bq/sample		
MAPEP-15-XrM33	Th-230	0.0272 +/- 0.0018 Bq/sample		
MAPEP-15-XrM33	Th-232	0.0161 +/- 0.0018 Bq/sample		
MAPEP-15-XrM33	U-234	0.038 +/- 0.002 Bq/sample		
MAPEP-15-XrM33	U-238	0.117 +/- 0.004 Bq/sample		
MAPEP-15-XrM33	Zn-65	1.15 +/- 0.04 Bq/sample	0.87 +/- 0.15 Bq/sample	-24.3

Radiological Reference Date: August 1, 2015

Mixed Analyte Performance Evaluation Program

Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-15-XrM33
(CMRC01) Carlsbad Environmental Monitoring and Research Center
1400 University Dr.
Carlsbad, NM 88220

Radiological

Sample ID	Nuclide	Known Activity	Expt'l Activity	Bias (%)
MAPEP-15-XrM33	Am-241	0.077 +/- 0.003 Bq/sample	6.99E-02 +/- 5.11E-03	-9.2
MAPEP-15-XrM33	Cs-134	1.37 +/- 0.04 Bq/sample	1.40E+00 +/- 4.30E-02	2.2
MAPEP-15-XrM33	Cs-137	2.01 +/- 0.05 Bq/sample	2.05E+00 +/- 5.87E-02	2.0
MAPEP-15-XrM33	Co-57	2.43 +/- 0.07 Bq/sample	2.47E+00 +/- 7.68E-02	1.6
MAPEP-15-XrM33	Co-60	1.56 +/- 0.06 Bq/sample	1.54E+00 +/- 3.96E-02	-1.3
MAPEP-15-XrM33	Cm-244	0.105 +/- 0.003 Bq/sample	9.92E-02 +/- 6.85E-03	-5.5
MAPEP-15-XrM33	Ir-192	4.76 +/- 0.15 Bq/sample		
MAPEP-15-XrM33	Mn-54	1.64 +/- 0.05 Bq/sample	1.66E+00 +/- 5.48E-02	1.2
MAPEP-15-XrM33	Pu-238	0.098 +/- 0.003 Bq/sample	9.22E-02 +/- 6.61E-03	-5.9
MAPEP-15-XrM33	Pu-239	0.077 +/- 0.003 Bq/sample	7.61E-02 +/- 5.60E-03	-1.2
MAPEP-15-XrM33	K-40		5.77E-02 +/- 2.49E-01	
MAPEP-15-XrM33	Sr-90	1.19 +/- 0.04 Bq/sample		
MAPEP-15-XrM33	Tc-99	1.11 +/- 0.03 Bq/sample		
MAPEP-15-XrM33	Th-228	0.0155 +/- 0.0014 Bq/sample		
MAPEP-15-XrM33	Th-230	0.0272 +/- 0.0018 Bq/sample		
MAPEP-15-XrM33	Th-232	0.0161 +/- 0.0018 Bq/sample		
MAPEP-15-XrM33	U-234	0.038 +/- 0.002 Bq/sample	3.56E-02 +/- 3.28E-03	-6.3
MAPEP-15-XrM33	U-235		2.77E-03 +/- 7.69E-04	
MAPEP-15-XrM33	U-238	0.117 +/- 0.004 Bq/sample	1.16E-01 +/- 8.55E-03	-0.9
MAPEP-15-XrM33	Zn-65	1.15 +/- 0.04 Bq/sample	1.25E+00 +/- 1.03E-01	8.7

Radiological Reference Date: August 1, 2015

MAPEP Mixed Analyte Performance Evaluation Program

Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-15-XrM33
(CRCE99) Centre for Radiation, Chemical and Environmental Hazards
Public Health England
Didcot, OXON OX11 0RQ

Radiological

Sample ID	Nuclide	Known Activity	Expt'l Activity	Bias (%)
MAPEP-15-XrM33	Am-241	0.077 +/- 0.003 Bq/sample	0.07 +/- 0.01 Bq/sample	-9.1
MAPEP-15-XrM33	Cs-134	1.37 +/- 0.04 Bq/sample	1.5 +/- 0.1 Bq/sample	9.5
MAPEP-15-XrM33	Cs-137	2.01 +/- 0.05 Bq/sample	2.1 +/- 0.2 Bq/sample	4.5
MAPEP-15-XrM33	Co-57	2.43 +/- 0.07 Bq/sample	2.7 +/- 0.4 Bq/sample	11.1
MAPEP-15-XrM33	Co-60	1.56 +/- 0.06 Bq/sample	1.8 +/- 0.2 Bq/sample	15.4
MAPEP-15-XrM33	Cm-244	0.105 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Ir-192	4.76 +/- 0.15 Bq/sample	5.2 +/- 0.4 Bq/sample	9.2
MAPEP-15-XrM33	Mn-54	1.64 +/- 0.05 Bq/sample	1.7 +/- 0.2 Bq/sample	3.7
MAPEP-15-XrM33	Pu-238	0.098 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Pu-239	0.077 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Sr-90	1.19 +/- 0.04 Bq/sample		
MAPEP-15-XrM33	Tc-99	1.11 +/- 0.03 Bq/sample		
MAPEP-15-XrM33	Th-228	0.0155 +/- 0.0014 Bq/sample		
MAPEP-15-XrM33	Th-230	0.0272 +/- 0.0018 Bq/sample		
MAPEP-15-XrM33	Th-232	0.0161 +/- 0.0018 Bq/sample		
MAPEP-15-XrM33	U-234	0.038 +/- 0.002 Bq/sample		
MAPEP-15-XrM33	U-238	0.117 +/- 0.004 Bq/sample		
MAPEP-15-XrM33	Zn-65	1.15 +/- 0.04 Bq/sample	1.3 +/- 0.1 Bq/sample	13.0

Radiological Reference Date: August 1, 2015

MAPEP Mixed Analyte Performance Evaluation Program

Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-15-XrM33
(DINL99) Departamento Ingeniería Nuclear y Mecánica de Fluidos
Alameda de Urquijo s/n
Bilbao, Vizcaya 48013

Radiological

Sample ID	Nuclide	Known Activity	Expt'l Activity	Bias (%)
MAPEP-15-XrM33	Am-241	0.077 +/- 0.003 Bq/sample	0.293 +/- 0.011 Bq/sample	280.5
MAPEP-15-XrM33	Cs-134	1.37 +/- 0.04 Bq/sample	1.36 +/- 0.045 Bq/sample	-0.7
MAPEP-15-XrM33	Cs-137	2.01 +/- 0.05 Bq/sample	2.01 +/- 0.037 Bq/sample	0.0
MAPEP-15-XrM33	Co-57	2.43 +/- 0.07 Bq/sample	2.34 +/- 0.04 Bq/sample	-3.7
MAPEP-15-XrM33	Co-60	1.56 +/- 0.06 Bq/sample	1.55 +/- 0.028 Bq/sample	-0.6
MAPEP-15-XrM33	Cm-244	0.105 +/- 0.003 Bq/sample	0.378 +/- 0.013 Bq/sample	260.0
MAPEP-15-XrM33	I-129		0.211 +/- 0.211 Bq/sample	
MAPEP-15-XrM33	Ir-192	4.76 +/- 0.15 Bq/sample	4.33 +/- 0.08 Bq/sample	-9.0
MAPEP-15-XrM33	Fe-55		0.286 +/- 0.054 Bq/sample	
MAPEP-15-XrM33	Mn-54	1.64 +/- 0.05 Bq/sample	1.64 +/- 0.039 Bq/sample	0.0
MAPEP-15-XrM33	Ni-63		0.192 +/- 0.058 Bq/sample	
MAPEP-15-XrM33	Pu-238	0.098 +/- 0.003 Bq/sample	0.371 +/- 0.015 Bq/sample	278.6
MAPEP-15-XrM33	Pu-239	0.077 +/- 0.003 Bq/sample	0.306 +/- 0.013 Bq/sample	297.4
MAPEP-15-XrM33	Sr-89		7.26 +/- 0.74 Bq/sample	
MAPEP-15-XrM33	Sr-90	1.19 +/- 0.04 Bq/sample	2.27 +/- 0.270 Bq/sample	90.8
MAPEP-15-XrM33	Tc-99	1.11 +/- 0.03 Bq/sample	1.77 +/- 0.052 Bq/sample	59.5
MAPEP-15-XrM33	Th-228	0.0155 +/- 0.0014 Bq/sample	0.0807 +/- 0.0063 Bq/sample	420.6
MAPEP-15-XrM33	Th-230	0.0272 +/- 0.0018 Bq/sample	0.107 +/- 0.0074 Bq/sample	293.4
MAPEP-15-XrM33	Th-232	0.0161 +/- 0.0018 Bq/sample	0.0747 +/- 0.006 Bq/sample	364.0
MAPEP-15-XrM33	U-234	0.038 +/- 0.002 Bq/sample	0.152 +/- 0.0086 Bq/sample	300.0
MAPEP-15-XrM33	U-235		0.021 +/- 0.0033 Bq/sample	
MAPEP-15-XrM33	U-238	0.117 +/- 0.004 Bq/sample	0.463 +/- 0.017 Bq/sample	295.7
MAPEP-15-XrM33	Zn-65	1.15 +/- 0.04 Bq/sample	1.18 +/- 0.042 Bq/sample	2.6

Radiological Reference Date: August 1, 2015

MAPEP Mixed Analyte Performance Evaluation Program

Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-15-XrM33
(DPHE01) Colorado Dept. of Public Health & Env. / Laboratory Services Div.
8100 Lowry Blvd
Denver, CO 80230

Radiological

Sample ID	Nuclide	Known Activity	Expt'l Activity	Bias (%)
MAPEP-15-XrM33	Am-241	0.077 +/- 0.003 Bq/sample	0.082 +/- 0.016 Bq/sample	6.5
MAPEP-15-XrM33	Cs-134	1.37 +/- 0.04 Bq/sample	1.18 +/- 0.13 Bq/sample	-13.9
MAPEP-15-XrM33	Cs-137	2.01 +/- 0.05 Bq/sample	2.124 +/- 0.159 Bq/sample	5.7
MAPEP-15-XrM33	Co-57	2.43 +/- 0.07 Bq/sample	2.006 +/- 0.148 Bq/sample	-17.4
MAPEP-15-XrM33	Co-60	1.56 +/- 0.06 Bq/sample	1.588 +/- 0.144 Bq/sample	1.8
MAPEP-15-XrM33	Cm-244	0.105 +/- 0.003 Bq/sample	0.126 +/- 0.021 Bq/sample	20.0
MAPEP-15-XrM33	Ir-192	4.76 +/- 0.15 Bq/sample	2.228 +/- 0.240 Bq/sample	-53.2
MAPEP-15-XrM33	Mn-54	1.64 +/- 0.05 Bq/sample	1.765 +/- 0.166 Bq/sample	7.6
MAPEP-15-XrM33	Pu-238	0.098 +/- 0.003 Bq/sample	0.096 +/- 0.008 Bq/sample	-2.0
MAPEP-15-XrM33	Pu-239	0.077 +/- 0.003 Bq/sample	0.078 +/- 0.007 Bq/sample	1.3
MAPEP-15-XrM33	Sr-90	1.19 +/- 0.04 Bq/sample	1.273 +/- 0.070 Bq/sample	7.0
MAPEP-15-XrM33	Tc-99	1.11 +/- 0.03 Bq/sample		
MAPEP-15-XrM33	Th-228	0.0155 +/- 0.0014 Bq/sample		
MAPEP-15-XrM33	Th-230	0.0272 +/- 0.0018 Bq/sample		
MAPEP-15-XrM33	Th-232	0.0161 +/- 0.0018 Bq/sample		
MAPEP-15-XrM33	U-234	0.038 +/- 0.002 Bq/sample	0.035 +/- 0.007 Bq/sample	-7.9
MAPEP-15-XrM33	U-238	0.117 +/- 0.004 Bq/sample	0.120 +/- 0.025 Bq/sample	2.6
MAPEP-15-XrM33	Zn-65	1.15 +/- 0.04 Bq/sample	1.685 +/- 0.333 Bq/sample	46.5

Radiological Reference Date: August 1, 2015

Mixed Analyte Performance Evaluation Program

Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-15-XrM33
(EULC01) EnergySolutions, LLC
I-80, Exit 49
Clive, UT 84029

Radiological

Sample ID	Nuclide	Known Activity	Expt'l Activity	Bias (%)
MAPEP-15-XrM33	Ac-228		3.455 +/- 2.2 Bq/sample	
MAPEP-15-XrM33	Am-241	0.077 +/- 0.003 Bq/sample	-1.316 +/- .73 Bq/sample	-1809.1
MAPEP-15-XrM33	Sb-124		.607 +/- .31 Bq/sample	
MAPEP-15-XrM33	Sb-125		4.756 +/- 2.98 Bq/sample	
MAPEP-15-XrM33	Ba-133		-.54 +/- .28 Bq/sample	
MAPEP-15-XrM33	Cd-109		-8.019 +/- 4.2 Bq/sample	
MAPEP-15-XrM33	Ce-144		-.373 +/- .19 Bq/sample	
MAPEP-15-XrM33	Cs-134	1.37 +/- 0.04 Bq/sample	.99 +/- .16 Bq/sample	-27.7
MAPEP-15-XrM33	Cs-137	2.01 +/- 0.05 Bq/sample	2.29 +/- .38 Bq/sample	13.9
MAPEP-15-XrM33	Co-57	2.43 +/- 0.07 Bq/sample	2.04 +/- .38 Bq/sample	-16.0
MAPEP-15-XrM33	Co-58		-.033 +/- .02 Bq/sample	
MAPEP-15-XrM33	Co-60	1.56 +/- 0.06 Bq/sample	1.27 +/- .18 Bq/sample	-18.6
MAPEP-15-XrM33	Cm-244	0.105 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Eu-152		1.072 +/- .62 Bq/sample	
MAPEP-15-XrM33	Eu-154		.492 +/- .3 Bq/sample	
MAPEP-15-XrM33	Ir-192	4.76 +/- 0.15 Bq/sample	3.21 +/- .42 Bq/sample	-32.6
MAPEP-15-XrM33	Mn-54	1.64 +/- 0.05 Bq/sample	1.38 +/- .29 Bq/sample	-15.9
MAPEP-15-XrM33	Np-237		.044 +/- .028 Bq/sample	
MAPEP-15-XrM33	Pu-238	0.098 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Pu-239	0.077 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	K-40		11.03 +/- 2.4 Bq/sample	
MAPEP-15-XrM33	Se-75		2.282 +/- 1.3 Bq/sample	
MAPEP-15-XrM33	Ag-110m		-.077 +/- .04 Bq/sample	
MAPEP-15-XrM33	Sr-90	1.19 +/- 0.04 Bq/sample		
MAPEP-15-XrM33	Tc-99	1.11 +/- 0.03 Bq/sample		
MAPEP-15-XrM33	Th-228	0.0155 +/- 0.0014 Bq/sample		
MAPEP-15-XrM33	Th-230	0.0272 +/- 0.0018 Bq/sample		
MAPEP-15-XrM33	Th-232	0.0161 +/- 0.0018 Bq/sample		
MAPEP-15-XrM33	U-234	0.038 +/- 0.002 Bq/sample		
MAPEP-15-XrM33	U-238	0.117 +/- 0.004 Bq/sample		
MAPEP-15-XrM33	Zn-65	1.15 +/- 0.04 Bq/sample		
MAPEP-15-XrM33	Zr-95		-1.972 +/- 1 Bq/sample	

Radiological Reference Date: August 1, 2015

MAPEP Mixed Analyte Performance Evaluation Program

Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-15-XrM33
(FDHE01) Florida Dept of Health Environmental Laboratory
PO Box 680069
Orlando, FL 32868-0069

Radiological

Sample ID	Nuclide	Known Activity	Expt'l Activity	Bias (%)
MAPEP-15-XrM33	Am-241	0.077 +/- 0.003 Bq/sample	7.62E-2 +/- 3.12E-3 Bq/sample	-1.0
MAPEP-15-XrM33	Cs-134	1.37 +/- 0.04 Bq/sample	1.24 +/- 1.68E-2 Bq/sample	-9.5
MAPEP-15-XrM33	Cs-137	2.01 +/- 0.05 Bq/sample	2.15 +/- 3.85E-2 Bq/sample	7.0
MAPEP-15-XrM33	Co-57	2.43 +/- 0.07 Bq/sample	1.74 +/- 3.96E-2 Bq/sample	-28.4
MAPEP-15-XrM33	Co-60	1.56 +/- 0.06 Bq/sample	1.64 +/- 2.28E-2 Bq/sample	5.1
MAPEP-15-XrM33	Cm-244	0.105 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Ir-192	4.76 +/- 0.15 Bq/sample	3.33 +/- 3.28E-2 Bq/sample	-30.0
MAPEP-15-XrM33	Mn-54	1.64 +/- 0.05 Bq/sample	1.83 +/- 3.22E-2 Bq/sample	11.6
MAPEP-15-XrM33	Pu-238	0.098 +/- 0.003 Bq/sample	0.094 +/- 8.0E-3 Bq/sample	-4.1
MAPEP-15-XrM33	Pu-239	0.077 +/- 0.003 Bq/sample	0.071 +/- 7.0E-3 Bq/sample	-7.8
MAPEP-15-XrM33	Sr-90	1.19 +/- 0.04 Bq/sample	1.10 +/- 0.05 Bq/sample	-7.6
MAPEP-15-XrM33	Tc-99	1.11 +/- 0.03 Bq/sample		
MAPEP-15-XrM33	Th-228	0.0155 +/- 0.0014 Bq/sample		
MAPEP-15-XrM33	Th-230	0.0272 +/- 0.0018 Bq/sample		
MAPEP-15-XrM33	Th-232	0.0161 +/- 0.0018 Bq/sample		
MAPEP-15-XrM33	U-234	0.038 +/- 0.002 Bq/sample	0.032 +/- 4.0E-3 Bq/sample	-15.8
MAPEP-15-XrM33	U-238	0.117 +/- 0.004 Bq/sample	0.106 +/- 8.0E-3 Bq/sample	-9.4
MAPEP-15-XrM33	Zn-65	1.15 +/- 0.04 Bq/sample	1.42 +/- 2.44E-2 Bq/sample	23.5

Radiological Reference Date: August 1, 2015

Mixed Analyte Performance Evaluation Program

Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-15-XrM33
(GENE01) GEL Laboratories, LLC
2040 Savage Road
Charleston, SC 29407

Radiological

Sample ID	Nuclide	Known Activity	Expt'l Activity	Bias (%)
MAPEP-15-XrM33	Am-241	0.077 +/- 0.003 Bq/sample	0.0762 +/- 0.00898 Bq/sample	-1.0
MAPEP-15-XrM33	Cs-134	1.37 +/- 0.04 Bq/sample	1.27 +/- 0.0848 Bq/sample	-7.3
MAPEP-15-XrM33	Cs-137	2.01 +/- 0.05 Bq/sample	2.07 +/- 0.105 Bq/sample	3.0
MAPEP-15-XrM33	Co-57	2.43 +/- 0.07 Bq/sample	2.58 +/- 0.130 Bq/sample	6.2
MAPEP-15-XrM33	Co-60	1.56 +/- 0.06 Bq/sample	1.54 +/- 0.0943 Bq/sample	-1.3
MAPEP-15-XrM33	Cm-244	0.105 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Ir-192	4.76 +/- 0.15 Bq/sample	4.15 +/- 0.199 Bq/sample	-12.8
MAPEP-15-XrM33	Mn-54	1.64 +/- 0.05 Bq/sample	1.77 +/- 0.116 Bq/sample	7.9
MAPEP-15-XrM33	Pu-238	0.098 +/- 0.003 Bq/sample	0.0818 +/- 0.00905 Bq/sample	-16.5
MAPEP-15-XrM33	Pu-239	0.077 +/- 0.003 Bq/sample	0.0787 +/- 0.00902 Bq/sample	2.2
MAPEP-15-XrM33	Sr-90	1.19 +/- 0.04 Bq/sample	0.889 +/- 0.0411 Bq/sample	-25.3
MAPEP-15-XrM33	Tc-99	1.11 +/- 0.03 Bq/sample		
MAPEP-15-XrM33	Th-228	0.0155 +/- 0.0014 Bq/sample		
MAPEP-15-XrM33	Th-230	0.0272 +/- 0.0018 Bq/sample		
MAPEP-15-XrM33	Th-232	0.0161 +/- 0.0018 Bq/sample		
MAPEP-15-XrM33	U-234	0.038 +/- 0.002 Bq/sample	0.0434 +/- 0.00503 Bq/sample	14.2
MAPEP-15-XrM33	U-238	0.117 +/- 0.004 Bq/sample	0.119 +/- 0.0099 Bq/sample	1.7
MAPEP-15-XrM33	Zn-65	1.15 +/- 0.04 Bq/sample	1.36 +/- 0.164 Bq/sample	18.3

Radiological Reference Date: August 1, 2015

Mixed Analyte Performance Evaluation Program

Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-15-XrM33
(HECR01) SC Dept. Health and Environmental Control Radiological Laboratory
8231 Parklane Road
Columbia, SC 29223

Radiological

Sample ID	Nuclide	Known Activity	Expt'l Activity	Bias (%)
MAPEP-15-XrM33	Am-241	0.077 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Cs-134	1.37 +/- 0.04 Bq/sample	1.375 +/- 0.206 Bq/sample	0.4
MAPEP-15-XrM33	Cs-137	2.01 +/- 0.05 Bq/sample	1.963 +/- 0.309 Bq/sample	-2.3
MAPEP-15-XrM33	Co-57	2.43 +/- 0.07 Bq/sample	2.368 +/- 0.289 Bq/sample	-2.6
MAPEP-15-XrM33	Co-60	1.56 +/- 0.06 Bq/sample	1.586 +/- 0.215 Bq/sample	1.7
MAPEP-15-XrM33	Cm-244	0.105 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Ir-192	4.76 +/- 0.15 Bq/sample	4.024 +/- 0.342 Bq/sample	-15.5
MAPEP-15-XrM33	Mn-54	1.64 +/- 0.05 Bq/sample	1.696 +/- 0.296 Bq/sample	3.4
MAPEP-15-XrM33	Pu-238	0.098 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Pu-239	0.077 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Sr-90	1.19 +/- 0.04 Bq/sample		
MAPEP-15-XrM33	Tc-99	1.11 +/- 0.03 Bq/sample		
MAPEP-15-XrM33	Th-228	0.0155 +/- 0.0014 Bq/sample		
MAPEP-15-XrM33	Th-230	0.0272 +/- 0.0018 Bq/sample		
MAPEP-15-XrM33	Th-232	0.0161 +/- 0.0018 Bq/sample		
MAPEP-15-XrM33	U-234	0.038 +/- 0.002 Bq/sample		
MAPEP-15-XrM33	U-238	0.117 +/- 0.004 Bq/sample		
MAPEP-15-XrM33	Zn-65	1.15 +/- 0.04 Bq/sample	0.870 +/- 0.425 Bq/sample	-24.3

Radiological Reference Date: August 1, 2015

MAPEP Mixed Analyte Performance Evaluation Program

Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-15-XrM33
(JAEC99) Research Laboratories and Information Directorate
Jordan Atomic Energy Commission
Amman, Jordan 70 (11934)

Radiological

Sample ID	Nuclide	Known Activity	Expt'l Activity	Bias (%)
MAPEP-15-XrM33	Am-241	0.077 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Cs-134	1.37 +/- 0.04 Bq/sample	1.915 +/- 0.125 Bq/sample	39.8
MAPEP-15-XrM33	Cs-137	2.01 +/- 0.05 Bq/sample	2.10 +/- 0.16 Bq/sample	4.5
MAPEP-15-XrM33	Co-57	2.43 +/- 0.07 Bq/sample	4.023 +/- 0.303 Bq/sample	65.6
MAPEP-15-XrM33	Co-60	1.56 +/- 0.06 Bq/sample	1.593 +/- 0.135 Bq/sample	2.1
MAPEP-15-XrM33	Cm-244	0.105 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Ir-192	4.76 +/- 0.15 Bq/sample		
MAPEP-15-XrM33	Mn-54	1.64 +/- 0.05 Bq/sample	2.6 +/- 0.191 Bq/sample	58.5
MAPEP-15-XrM33	Pu-238	0.098 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Pu-239	0.077 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Sr-90	1.19 +/- 0.04 Bq/sample	2.740 +/- 0.0859 Bq/sample	130.3
MAPEP-15-XrM33	Tc-99	1.11 +/- 0.03 Bq/sample		
MAPEP-15-XrM33	Th-228	0.0155 +/- 0.0014 Bq/sample		
MAPEP-15-XrM33	Th-230	0.0272 +/- 0.0018 Bq/sample	0.314 +/- 0.034 Bq/sample	1054.4
MAPEP-15-XrM33	Th-232	0.0161 +/- 0.0018 Bq/sample		
MAPEP-15-XrM33	U-234	0.038 +/- 0.002 Bq/sample		
MAPEP-15-XrM33	U-238	0.117 +/- 0.004 Bq/sample		
MAPEP-15-XrM33	Zn-65	1.15 +/- 0.04 Bq/sample	2.09 +/- 0.18 Bq/sample	81.7

Radiological Reference Date: August 1, 2015

Mixed Analyte Performance Evaluation Program

Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-15-XrM33
(LANL01) Los Alamos National Laboratory
Mail Stop J514
Los Alamos, NM 87545

Radiological

Sample ID	Nuclide	Known Activity	Expt'l Activity	Bias (%)
MAPEP-15-XrM33	Am-241	0.077 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Cs-134	1.37 +/- 0.04 Bq/sample	1.37 +/- 0.17 Bq/sample	0.0
MAPEP-15-XrM33	Cs-137	2.01 +/- 0.05 Bq/sample	1.88 +/- 0.18 Bq/sample	-6.5
MAPEP-15-XrM33	Co-57	2.43 +/- 0.07 Bq/sample	2.20 +/- 0.17 Bq/sample	-9.5
MAPEP-15-XrM33	Co-60	1.56 +/- 0.06 Bq/sample	1.62 +/- 0.13 Bq/sample	3.8
MAPEP-15-XrM33	Cm-244	0.105 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Ir-192	4.76 +/- 0.15 Bq/sample		
MAPEP-15-XrM33	Mn-54	1.64 +/- 0.05 Bq/sample	1.58 +/- 0.18 Bq/sample	-3.7
MAPEP-15-XrM33	Pu-238	0.098 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Pu-239	0.077 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Sr-90	1.19 +/- 0.04 Bq/sample		
MAPEP-15-XrM33	Tc-99	1.11 +/- 0.03 Bq/sample		
MAPEP-15-XrM33	Th-228	0.0155 +/- 0.0014 Bq/sample		
MAPEP-15-XrM33	Th-230	0.0272 +/- 0.0018 Bq/sample		
MAPEP-15-XrM33	Th-232	0.0161 +/- 0.0018 Bq/sample		
MAPEP-15-XrM33	U-234	0.038 +/- 0.002 Bq/sample		
MAPEP-15-XrM33	U-238	0.117 +/- 0.004 Bq/sample		
MAPEP-15-XrM33	Zn-65	1.15 +/- 0.04 Bq/sample		

Radiological Reference Date: August 1, 2015

MAPEP Mixed Analyte Performance Evaluation Program

Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-15-XrM33
(LDRA99) Laboratori de Radiologia Ambiental-Universitat de Barcelona
Facultat de Quimica
Barcelona, Catalunya 08028

Radiological

Sample ID	Nuclide	Known Activity	Expt'l Activity	Bias (%)
MAPEP-15-XrM33	Am-241	0.077 +/- 0.003 Bq/sample	0.079 +/- 0.003 Bq/sample	2.6
MAPEP-15-XrM33	Cs-134	1.37 +/- 0.04 Bq/sample	1.38 +/- 0.17 Bq/sample	0.7
MAPEP-15-XrM33	Cs-137	2.01 +/- 0.05 Bq/sample	2.4 +/- 0.3 Bq/sample	19.4
MAPEP-15-XrM33	Co-57	2.43 +/- 0.07 Bq/sample	2.5 +/- 0.3 Bq/sample	2.9
MAPEP-15-XrM33	Co-60	1.56 +/- 0.06 Bq/sample	1.57 +/- 0.19 Bq/sample	0.6
MAPEP-15-XrM33	Cm-244	0.105 +/- 0.003 Bq/sample	0.102 +/- 0.003 Bq/sample	-2.9
MAPEP-15-XrM33	Ir-192	4.76 +/- 0.15 Bq/sample	4.0 +/- 0.5 Bq/sample	-16.0
MAPEP-15-XrM33	Mn-54	1.64 +/- 0.05 Bq/sample	1.71 +/- 0.21 Bq/sample	4.3
MAPEP-15-XrM33	Pu-238	0.098 +/- 0.003 Bq/sample	0.089 +/- 0.003 Bq/sample	-9.2
MAPEP-15-XrM33	Pu-239	0.077 +/- 0.003 Bq/sample	0.082 +/- 0.003 Bq/sample	6.5
MAPEP-15-XrM33	Sr-90	1.19 +/- 0.04 Bq/sample	1.05 +/- 0.06 Bq/sample	-11.8
MAPEP-15-XrM33	Tc-99	1.11 +/- 0.03 Bq/sample		
MAPEP-15-XrM33	Th-228	0.0155 +/- 0.0014 Bq/sample		
MAPEP-15-XrM33	Th-230	0.0272 +/- 0.0018 Bq/sample		
MAPEP-15-XrM33	Th-232	0.0161 +/- 0.0018 Bq/sample		
MAPEP-15-XrM33	U-234	0.038 +/- 0.002 Bq/sample	0.041 +/- 0.002 Bq/sample	7.9
MAPEP-15-XrM33	U-235		0.0027 +/- 0.0003 Bq/sample	
MAPEP-15-XrM33	U-238	0.117 +/- 0.004 Bq/sample	0.128 +/- 0.005 Bq/sample	9.4
MAPEP-15-XrM33	Zn-65	1.15 +/- 0.04 Bq/sample	1.30 +/- 0.17 Bq/sample	13.0

Radiological Reference Date: August 1, 2015

Mixed Analyte Performance Evaluation Program

Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-15-XrM33
(LERL99) LARUEX Environmental Radioactivity Laboratory
Dpt. Applied Physics, Faculty of Vet. Sciences
Caceres, Caceres 10003

Radiological

Sample ID	Nuclide	Known Activity	Expt'l Activity	Bias (%)
MAPEP-15-XrM33	Am-241	0.077 +/- 0.003 Bq/sample	0.061 +/- 0.011 Bq/sample	-20.8
MAPEP-15-XrM33	Cs-134	1.37 +/- 0.04 Bq/sample	1.76 +/- 0.14 Bq/sample	28.5
MAPEP-15-XrM33	Cs-137	2.01 +/- 0.05 Bq/sample	2.45 +/- 0.20 Bq/sample	21.9
MAPEP-15-XrM33	Co-57	2.43 +/- 0.07 Bq/sample	2.63 +/- 0.22 Bq/sample	8.2
MAPEP-15-XrM33	Co-60	1.56 +/- 0.06 Bq/sample	1.74 +/- 0.14 Bq/sample	11.5
MAPEP-15-XrM33	Cm-244	0.105 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Ir-192	4.76 +/- 0.15 Bq/sample		
MAPEP-15-XrM33	Mn-54	1.64 +/- 0.05 Bq/sample	1.90 +/- 0.17 Bq/sample	15.9
MAPEP-15-XrM33	Pu-238	0.098 +/- 0.003 Bq/sample	0.092 +/- 0.008 Bq/sample	-6.1
MAPEP-15-XrM33	Pu-239	0.077 +/- 0.003 Bq/sample	0.083 +/- 0.009 Bq/sample	7.8
MAPEP-15-XrM33	Ra-226		0.240 +/- 0.030 Bq/sample	
MAPEP-15-XrM33	Sr-90	1.19 +/- 0.04 Bq/sample	1.06 +/- 0.21 Bq/sample	-10.9
MAPEP-15-XrM33	Tc-99	1.11 +/- 0.03 Bq/sample		
MAPEP-15-XrM33	Th-228	0.0155 +/- 0.0014 Bq/sample		
MAPEP-15-XrM33	Th-230	0.0272 +/- 0.0018 Bq/sample		
MAPEP-15-XrM33	Th-232	0.0161 +/- 0.0018 Bq/sample		
MAPEP-15-XrM33	U-234	0.038 +/- 0.002 Bq/sample	0.035 +/- 0.007 Bq/sample	-7.9
MAPEP-15-XrM33	U-238	0.117 +/- 0.004 Bq/sample	0.112 +/- 0.013 Bq/sample	-4.3
MAPEP-15-XrM33	Zn-65	1.15 +/- 0.04 Bq/sample	1.42 +/- 0.14 Bq/sample	23.5

Radiological Reference Date: August 1, 2015

Mixed Analyte Performance Evaluation Program

Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-15-XrM33
(MAHP59) Materials Assessment and Health Physics Group
Imperial College Reactor Centre
Ascot, Berkshire SL5 7TE

Radiological

Sample ID	Nuclide	Known Activity	Expt'l Activity	Bias (%)
MAPEP-15-XrM33	Am-241	0.077 +/- 0.003 Bq/sample	0.06 +/- 0.01 Bq/sample	-22.1
MAPEP-15-XrM33	Cs-134	1.37 +/- 0.04 Bq/sample	1.51 +/- 0.05 Bq/sample	10.2
MAPEP-15-XrM33	Cs-137	2.01 +/- 0.05 Bq/sample	1.86 +/- 0.06 Bq/sample	-7.5
MAPEP-15-XrM33	Co-57	2.43 +/- 0.07 Bq/sample	2.19 +/- 0.06 Bq/sample	-9.9
MAPEP-15-XrM33	Co-60	1.56 +/- 0.06 Bq/sample	1.61 +/- 0.08 Bq/sample	3.2
MAPEP-15-XrM33	Cm-244	0.105 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Ir-192	4.76 +/- 0.15 Bq/sample	3.37 +/- 0.09 Bq/sample	-29.2
MAPEP-15-XrM33	Mn-54	1.64 +/- 0.05 Bq/sample	1.42 +/- 0.04 Bq/sample	-13.4
MAPEP-15-XrM33	Pu-238	0.098 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Pu-239	0.077 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Sr-90	1.19 +/- 0.04 Bq/sample		
MAPEP-15-XrM33	Tc-99	1.11 +/- 0.03 Bq/sample	4.7 +/- 0.2 Bq/sample	323.4
MAPEP-15-XrM33	Th-228	0.0155 +/- 0.0014 Bq/sample		
MAPEP-15-XrM33	Th-230	0.0272 +/- 0.0018 Bq/sample		
MAPEP-15-XrM33	Th-232	0.0161 +/- 0.0018 Bq/sample		
MAPEP-15-XrM33	U-234	0.038 +/- 0.002 Bq/sample		
MAPEP-15-XrM33	U-238	0.117 +/- 0.004 Bq/sample	1.40 +/- 0.18 Bq/sample	1096.6
MAPEP-15-XrM33	Zn-65	1.15 +/- 0.04 Bq/sample	0.98 +/- 0.05 Bq/sample	-14.8

Radiological Reference Date: August 1, 2015

Mixed Analyte Performance Evaluation Program

Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-15-XrM33
(NARL01) National Analytical Radiation Environmental Laboratory
540 S. Morris Ave.
Montgomery, AL 36115-2601

Radiological

Sample ID	Nuclide	Known Activity	Expt'l Activity	Bias (%)
MAPEP-15-XrM33	Am-241	0.077 +/- 0.003 Bq/sample	0.0845 +/- 0.00672 Bq/sample	9.7
MAPEP-15-XrM33	Cs-134	1.37 +/- 0.04 Bq/sample	1.38 +/- 0.0827 Bq/sample	0.7
MAPEP-15-XrM33	Cs-137	2.01 +/- 0.05 Bq/sample	2.01 +/- 0.116 Bq/sample	0.0
MAPEP-15-XrM33	Co-57	2.43 +/- 0.07 Bq/sample	2.40 +/- 0.134 Bq/sample	-1.2
MAPEP-15-XrM33	Co-60	1.56 +/- 0.06 Bq/sample	1.52 +/- 0.0862 Bq/sample	-2.6
MAPEP-15-XrM33	Cm-244	0.105 +/- 0.003 Bq/sample	0.100 +/- 0.00869 Bq/sample	-4.8
MAPEP-15-XrM33	Ir-192	4.76 +/- 0.15 Bq/sample	3.88 +/- 0.219 Bq/sample	-18.5
MAPEP-15-XrM33	Mn-54	1.64 +/- 0.05 Bq/sample	1.69 +/- 0.0982 Bq/sample	3.0
MAPEP-15-XrM33	Pu-238	0.098 +/- 0.003 Bq/sample	0.108 +/- 0.00879 Bq/sample	10.2
MAPEP-15-XrM33	Pu-239	0.077 +/- 0.003 Bq/sample	0.0839 +/- 0.00718 Bq/sample	9.0
MAPEP-15-XrM33	Sr-90	1.19 +/- 0.04 Bq/sample	1.22 +/- 0.0919 Bq/sample	2.5
MAPEP-15-XrM33	Tc-99	1.11 +/- 0.03 Bq/sample		
MAPEP-15-XrM33	Th-228	0.0155 +/- 0.0014 Bq/sample	0.0183 +/- 0.00251 Bq/sample	18.1
MAPEP-15-XrM33	Th-230	0.0272 +/- 0.0018 Bq/sample	0.0308 +/- 0.00367 Bq/sample	13.2
MAPEP-15-XrM33	Th-232	0.0161 +/- 0.0018 Bq/sample	0.0126 +/- 0.002 Bq/sample	-21.7
MAPEP-15-XrM33	U-234	0.038 +/- 0.002 Bq/sample	0.0403 +/- 0.00504 Bq/sample	6.1
MAPEP-15-XrM33	U-238	0.117 +/- 0.004 Bq/sample	0.111 +/- 0.0105 Bq/sample	-5.1
MAPEP-15-XrM33	Zn-65	1.15 +/- 0.04 Bq/sample	1.26 +/- 0.0886 Bq/sample	9.6

Radiological Reference Date: August 1, 2015

Mixed Analyte Performance Evaluation Program

Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-15-XrM33
(NARL02) USEPA - NAREL - MERL
540 S Morris Ave
Montgomery, AL 36115

Radiological

Sample ID	Nuclide	Known Activity	Expt'l Activity	Bias (%)
MAPEP-15-XrM33	Am-241	0.077 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Cs-134	1.37 +/- 0.04 Bq/sample	1.47 +/- 0.098 Bq/sample	7.3
MAPEP-15-XrM33	Cs-137	2.01 +/- 0.05 Bq/sample	2.29 +/- 0.193 Bq/sample	13.9
MAPEP-15-XrM33	Co-57	2.43 +/- 0.07 Bq/sample	2.69 +/- 0.419 Bq/sample	10.7
MAPEP-15-XrM33	Co-60	1.56 +/- 0.06 Bq/sample	1.75 +/- 0.0645 Bq/sample	12.2
MAPEP-15-XrM33	Cm-244	0.105 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Ir-192	4.76 +/- 0.15 Bq/sample	5.12 +/- 0.371 Bq/sample	7.6
MAPEP-15-XrM33	Mn-54	1.64 +/- 0.05 Bq/sample	1.81 +/- 0.140 Bq/sample	10.4
MAPEP-15-XrM33	Pu-238	0.098 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Pu-239	0.077 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Sr-90	1.19 +/- 0.04 Bq/sample		
MAPEP-15-XrM33	Tc-99	1.11 +/- 0.03 Bq/sample		
MAPEP-15-XrM33	Th-228	0.0155 +/- 0.0014 Bq/sample		
MAPEP-15-XrM33	Th-230	0.0272 +/- 0.0018 Bq/sample		
MAPEP-15-XrM33	Th-232	0.0161 +/- 0.0018 Bq/sample		
MAPEP-15-XrM33	U-234	0.038 +/- 0.002 Bq/sample		
MAPEP-15-XrM33	U-238	0.117 +/- 0.004 Bq/sample		
MAPEP-15-XrM33	Zn-65	1.15 +/- 0.04 Bq/sample	1.22 +/- 0.119 Bq/sample	6.1

Radiological Reference Date: August 1, 2015

Mixed Analyte Performance Evaluation Program

Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-15-XrM33
(NRLL99) Environmental Radioactivity - National Centre for Radiation Science
PO Box 25099
Christchurch, Christchurch 8144

Radiological

Sample ID	Nuclide	Known Activity	Expt'l Activity	Bias (%)
MAPEP-15-XrM33	Am-241	0.077 +/- 0.003 Bq/sample	0.0709 +/- 0.0060 Bq/sample	-7.9
MAPEP-15-XrM33	Cs-134	1.37 +/- 0.04 Bq/sample	1.105 +/- 0.042 Bq/sample	-19.3
MAPEP-15-XrM33	Cs-137	2.01 +/- 0.05 Bq/sample	2.062 +/- 0.082 Bq/sample	2.6
MAPEP-15-XrM33	Co-57	2.43 +/- 0.07 Bq/sample	2.60 +/- 0.12 Bq/sample	7.0
MAPEP-15-XrM33	Co-60	1.56 +/- 0.06 Bq/sample	1.377 +/- 0.062 Bq/sample	-11.7
MAPEP-15-XrM33	Cm-244	0.105 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Ir-192	4.76 +/- 0.15 Bq/sample		
MAPEP-15-XrM33	Mn-54	1.64 +/- 0.05 Bq/sample	1.647 +/- 0.054 Bq/sample	0.4
MAPEP-15-XrM33	Pu-238	0.098 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Pu-239	0.077 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	K-40		0.195 +/- 0.080 Bq/sample	
MAPEP-15-XrM33	Sr-90	1.19 +/- 0.04 Bq/sample	1.011 +/- 0.032 Bq/sample	-15.0
MAPEP-15-XrM33	Tc-99	1.11 +/- 0.03 Bq/sample		
MAPEP-15-XrM33	Th-228	0.0155 +/- 0.0014 Bq/sample		
MAPEP-15-XrM33	Th-230	0.0272 +/- 0.0018 Bq/sample	0.0277 +/- 0.0035 Bq/sample	1.8
MAPEP-15-XrM33	Th-232	0.0161 +/- 0.0018 Bq/sample	0.0184 +/- 0.0028 Bq/sample	14.3
MAPEP-15-XrM33	U-234	0.038 +/- 0.002 Bq/sample	0.0401 +/- 0.0022 Bq/sample	5.5
MAPEP-15-XrM33	U-238	0.117 +/- 0.004 Bq/sample	0.1260 +/- 0.0054 Bq/sample	7.7
MAPEP-15-XrM33	Zn-65	1.15 +/- 0.04 Bq/sample	1.220 +/- 0.077 Bq/sample	6.1

Radiological Reference Date: August 1, 2015

MAPEP Mixed Analyte Performance Evaluation Program

Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-15-XrM33
(ODHL01) Ohio Department of Health Laboratory
8995 E Main Street
Reynoldsburg, OH 43068

Radiological

Sample ID	Nuclide	Known Activity	Expt'l Activity	Bias (%)
MAPEP-15-XrM33	Am-241	0.077 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Cs-134	1.37 +/- 0.04 Bq/sample	1.40 +/- 0.0593 Bq/sample	2.2
MAPEP-15-XrM33	Cs-137	2.01 +/- 0.05 Bq/sample	1.91 +/- 0.129 Bq/sample	-5.0
MAPEP-15-XrM33	Co-57	2.43 +/- 0.07 Bq/sample	2.55 +/- 0.193 Bq/sample	4.9
MAPEP-15-XrM33	Co-60	1.56 +/- 0.06 Bq/sample	1.56 +/- 0.0652 Bq/sample	0.0
MAPEP-15-XrM33	Cm-244	0.105 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Ir-192	4.76 +/- 0.15 Bq/sample		
MAPEP-15-XrM33	Mn-54	1.64 +/- 0.05 Bq/sample	1.64 +/- 0.102 Bq/sample	0.0
MAPEP-15-XrM33	Pu-238	0.098 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Pu-239	0.077 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Sr-90	1.19 +/- 0.04 Bq/sample		
MAPEP-15-XrM33	Tc-99	1.11 +/- 0.03 Bq/sample		
MAPEP-15-XrM33	Th-228	0.0155 +/- 0.0014 Bq/sample		
MAPEP-15-XrM33	Th-230	0.0272 +/- 0.0018 Bq/sample		
MAPEP-15-XrM33	Th-232	0.0161 +/- 0.0018 Bq/sample		
MAPEP-15-XrM33	U-234	0.038 +/- 0.002 Bq/sample		
MAPEP-15-XrM33	U-238	0.117 +/- 0.004 Bq/sample		
MAPEP-15-XrM33	Zn-65	1.15 +/- 0.04 Bq/sample	1.09 +/- 0.126 Bq/sample	-5.2

Radiological Reference Date: August 1, 2015

MAPEP Mixed Analyte Performance Evaluation Program

Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-15-XrM33
(ORIS01) ORISE/IEAV
PO Box 117
Oak Ridge, TN 37831-0117

Radiological

Sample ID	Nuclide	Known Activity	Expt'l Activity	Bias (%)
MAPEP-15-XrM33	Am-241	0.077 +/- 0.003 Bq/sample	0.070 +/- 0.005 Bq/sample	-9.1
MAPEP-15-XrM33	Cs-134	1.37 +/- 0.04 Bq/sample	1.412 +/- 0.054 Bq/sample	3.1
MAPEP-15-XrM33	Cs-137	2.01 +/- 0.05 Bq/sample	1.930 +/- 0.068 Bq/sample	-4.0
MAPEP-15-XrM33	Co-57	2.43 +/- 0.07 Bq/sample	2.351 +/- 0.068 Bq/sample	-3.3
MAPEP-15-XrM33	Co-60	1.56 +/- 0.06 Bq/sample	1.493 +/- 0.057 Bq/sample	-4.3
MAPEP-15-XrM33	Cm-244	0.105 +/- 0.003 Bq/sample	0.096 +/- 0.007 Bq/sample	-8.6
MAPEP-15-XrM33	Ir-192	4.76 +/- 0.15 Bq/sample	4.22 +/- 0.11 Bq/sample	-11.3
MAPEP-15-XrM33	Fe-55		0.292 +/- 0.028 Bq/sample	
MAPEP-15-XrM33	Mn-54	1.64 +/- 0.05 Bq/sample	1.671 +/- 0.057 Bq/sample	1.9
MAPEP-15-XrM33	Np-237		-0.0001 +/- 0.0003 Bq/sample	
MAPEP-15-XrM33	Ni-63		0.026 +/- 0.016 Bq/sample	
MAPEP-15-XrM33	Pu-238	0.098 +/- 0.003 Bq/sample	0.106 +/- 0.007 Bq/sample	8.2
MAPEP-15-XrM33	Pu-239	0.077 +/- 0.003 Bq/sample	0.071 +/- 0.005 Bq/sample	-7.8
MAPEP-15-XrM33	Sr-90	1.19 +/- 0.04 Bq/sample	1.166 +/- 0.034 Bq/sample	-2.0
MAPEP-15-XrM33	Tc-99	1.11 +/- 0.03 Bq/sample	1.014 +/- 0.038 Bq/sample	-8.6
MAPEP-15-XrM33	Th-228	0.0155 +/- 0.0014 Bq/sample	0.016 +/- 0.003 Bq/sample	3.2
MAPEP-15-XrM33	Th-230	0.0272 +/- 0.0018 Bq/sample	0.029 +/- 0.003 Bq/sample	6.6
MAPEP-15-XrM33	Th-232	0.0161 +/- 0.0018 Bq/sample	0.014 +/- 0.002 Bq/sample	-13.0
MAPEP-15-XrM33	U-234	0.038 +/- 0.002 Bq/sample	0.037 +/- 0.003 Bq/sample	-2.6
MAPEP-15-XrM33	U-235		0.003 +/- 0.001 Bq/sample	
MAPEP-15-XrM33	U-238	0.117 +/- 0.004 Bq/sample	0.108 +/- 0.007 Bq/sample	-7.7
MAPEP-15-XrM33	Zn-65	1.15 +/- 0.04 Bq/sample	1.154 +/- 0.067 Bq/sample	0.3

Radiological Reference Date: August 1, 2015

Mixed Analyte Performance Evaluation Program

Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-15-XrM33
(QUAN01) TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045-1205

Radiological

Sample ID	Nuclide	Known Activity	Expt'l Activity	Bias (%)
MAPEP-15-XrM33	Am-241	0.077 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Cs-134	1.37 +/- 0.04 Bq/sample		
MAPEP-15-XrM33	Cs-137	2.01 +/- 0.05 Bq/sample		
MAPEP-15-XrM33	Co-57	2.43 +/- 0.07 Bq/sample		
MAPEP-15-XrM33	Co-60	1.56 +/- 0.06 Bq/sample		
MAPEP-15-XrM33	Cm-244	0.105 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	I-129		1.25 +/- 0.0594 Bq/sample	
MAPEP-15-XrM33	Ir-192	4.76 +/- 0.15 Bq/sample		
MAPEP-15-XrM33	Mn-54	1.64 +/- 0.05 Bq/sample		
MAPEP-15-XrM33	Pu-238	0.098 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Pu-239	0.077 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Sr-90	1.19 +/- 0.04 Bq/sample		
MAPEP-15-XrM33	Tc-99	1.11 +/- 0.03 Bq/sample		
MAPEP-15-XrM33	Th-228	0.0155 +/- 0.0014 Bq/sample		
MAPEP-15-XrM33	Th-230	0.0272 +/- 0.0018 Bq/sample		
MAPEP-15-XrM33	Th-232	0.0161 +/- 0.0018 Bq/sample		
MAPEP-15-XrM33	U-234	0.038 +/- 0.002 Bq/sample		
MAPEP-15-XrM33	U-238	0.117 +/- 0.004 Bq/sample		
MAPEP-15-XrM33	Zn-65	1.15 +/- 0.04 Bq/sample		

Radiological Reference Date: August 1, 2015

MAPEP Mixed Analyte Performance Evaluation Program

Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-15-XrM33
(RAVR99) Radiactividad Ambiental y Vigilancia Radiologica
CIEMAT (Ed 70 P2 D11)
Madrid, Madrid 28040

Radiological

Sample ID	Nuclide	Known Activity	Expt'l Activity	Bias (%)
MAPEP-15-XrM33	Ac-228		0.036 +/- 2.06 Bq/sample	
MAPEP-15-XrM33	Am-241	0.077 +/- 0.003 Bq/sample	0.080 +/- 0.012 Bq/sample	3.9
MAPEP-15-XrM33	Sb-124		-0.2769 +/- 1.21 Bq/sample	
MAPEP-15-XrM33	Sb-125		-0.144 +/- 0.8317 Bq/sample	
MAPEP-15-XrM33	Ba-133		-0.5527 +/- 0.32 Bq/sample	
MAPEP-15-XrM33	Ba-140		31.7 +/- 63 Bq/sample	
MAPEP-15-XrM33	Cd-109		4.15 +/- 20 Bq/sample	
MAPEP-15-XrM33	Ce-139		-0.02 +/- 0.04 Bq/sample	
MAPEP-15-XrM33	Ce-144		0.71 +/- 1.85 Bq/sample	
MAPEP-15-XrM33	Cs-134	1.37 +/- 0.04 Bq/sample	1.17 +/- 0.25 Bq/sample	-14.6
MAPEP-15-XrM33	Cs-137	2.01 +/- 0.05 Bq/sample	1.96 +/- 0.30 Bq/sample	-2.5
MAPEP-15-XrM33	Co-57	2.43 +/- 0.07 Bq/sample	2.42 +/- 0.28 Bq/sample	-0.4
MAPEP-15-XrM33	Co-58		-1.498 +/- 0.8 Bq/sample	
MAPEP-15-XrM33	Co-60	1.56 +/- 0.06 Bq/sample	1.44 +/- 0.17 Bq/sample	-7.7
MAPEP-15-XrM33	Cm-244	0.105 +/- 0.003 Bq/sample	0.110 +/- 0.027 Bq/sample	4.8
MAPEP-15-XrM33	Eu-152		-0.2032 +/- 0.90 Bq/sample	
MAPEP-15-XrM33	Eu-154		0.265 +/- 0.998 Bq/sample	
MAPEP-15-XrM33	Eu-155		-0.278 +/- 0.652 Bq/sample	
MAPEP-15-XrM33	I-125		-1 +/- 1 Bq/sample	
MAPEP-15-XrM33	I-129		-0.534 +/- 1.648 Bq/sample	
MAPEP-15-XrM33	I-131		815 +/- 2157 Bq/sample	
MAPEP-15-XrM33	Ir-192	4.76 +/- 0.15 Bq/sample	-1 +/- 1 Bq/sample	-121.0
MAPEP-15-XrM33	Fe-55		-13.6 +/- 0.6 Bq/sample	
MAPEP-15-XrM33	La-140		403.5 +/- 551 Bq/sample	
MAPEP-15-XrM33	Mn-54	1.64 +/- 0.05 Bq/sample	1.75 +/- 0.31 Bq/sample	6.7
MAPEP-15-XrM33	Ni-63		-0.46 +/- 0.2 Bq/sample	
MAPEP-15-XrM33	Nb-94		-0.3435 +/- 0.2963 Bq/sample	
MAPEP-15-XrM33	Nb-95		1.59 +/- 2.30 Bq/sample	
MAPEP-15-XrM33	Pu-238	0.098 +/- 0.003 Bq/sample	0.0457 +/- 0.0024 Bq/sample	-53.4
MAPEP-15-XrM33	Pu-239	0.077 +/- 0.003 Bq/sample	0.0362 +/- 0.0021 Bq/sample	-53.0
MAPEP-15-XrM33	K-40		-1.079 +/- 4.23 Bq/sample	
MAPEP-15-XrM33	Ra-226		1.54 +/- 0.66 Bq/sample	
MAPEP-15-XrM33	Ru-103		-0.7504 +/- 1.691 Bq/sample	
MAPEP-15-XrM33	Ru-106		-2.494 +/- 3.485 Bq/sample	
MAPEP-15-XrM33	Se-75		-7.587 +/- 0.4891 Bq/sample	
MAPEP-15-XrM33	Ag-110m		-0.1802 +/- 0.2513 Bq/sample	
MAPEP-15-XrM33	Sr-90	1.19 +/- 0.04 Bq/sample	0.98 +/- 0.02 Bq/sample	-17.6

Radiological

Sample ID	Nuclide	Known Activity	Expt'l Activity	Bias (%)
MAPEP-15-XrM33	Tc-99	1.11 +/- 0.03 Bq/sample		
MAPEP-15-XrM33	Th-228	0.0155 +/- 0.0014 Bq/sample	0.00929 +/- 0.00077 Bq/sample	-40.1
MAPEP-15-XrM33	Th-230	0.0272 +/- 0.0018 Bq/sample	0.01367 +/- 0.00077 Bq/sample	-49.7
MAPEP-15-XrM33	Th-232	0.0161 +/- 0.0018 Bq/sample	0.00852 +/- 0.00052 Bq/sample	-47.1
MAPEP-15-XrM33	Sn-113		-0.107 +/- 0.6617 Bq/sample	
MAPEP-15-XrM33	U-234	0.038 +/- 0.002 Bq/sample	0.033 +/- 0.003 Bq/sample	-13.2
MAPEP-15-XrM33	U-238	0.117 +/- 0.004 Bq/sample	0.11 +/- 0.01 Bq/sample	-6.0
MAPEP-15-XrM33	Y-88		-0.2631 +/- 0.706 Bq/sample	
MAPEP-15-XrM33	Zn-65	1.15 +/- 0.04 Bq/sample	0.57 +/- 0.12 Bq/sample	-50.4
MAPEP-15-XrM33	Zr-95		-2.460 +/- 1.515 Bq/sample	

Radiological Reference Date: August 1, 2015

MAPEP Mixed Analyte Performance Evaluation Program

Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-15-XrM33
(RSIR99) Instituto de Radioprotecao e Dosimetria - IRD/CNEN
Avenida Salvador Allende S/no.
RJ, Rio de Janeiro 22783-127

Radiological

Sample ID	Nuclide	Known Activity	Expt'l Activity	Bias (%)
MAPEP-15-XrM33	Am-241	0.077 +/- 0.003 Bq/sample	0.057 +/- 0.009 Bq/sample	-26.0
MAPEP-15-XrM33	Cs-134	1.37 +/- 0.04 Bq/sample	1.006 +/- 0.045 Bq/sample	-26.6
MAPEP-15-XrM33	Cs-137	2.01 +/- 0.05 Bq/sample	1.749 +/- 0.070 Bq/sample	-13.0
MAPEP-15-XrM33	Co-57	2.43 +/- 0.07 Bq/sample	2.094 +/- 0.072 Bq/sample	-13.8
MAPEP-15-XrM33	Co-60	1.56 +/- 0.06 Bq/sample	1.200 +/- 0.047 Bq/sample	-23.1
MAPEP-15-XrM33	Cm-244	0.105 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Ir-192	4.76 +/- 0.15 Bq/sample		
MAPEP-15-XrM33	Mn-54	1.64 +/- 0.05 Bq/sample		
MAPEP-15-XrM33	Pu-238	0.098 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Pu-239	0.077 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Sr-90	1.19 +/- 0.04 Bq/sample		
MAPEP-15-XrM33	Tc-99	1.11 +/- 0.03 Bq/sample		
MAPEP-15-XrM33	Th-228	0.0155 +/- 0.0014 Bq/sample		
MAPEP-15-XrM33	Th-230	0.0272 +/- 0.0018 Bq/sample		
MAPEP-15-XrM33	Th-232	0.0161 +/- 0.0018 Bq/sample		
MAPEP-15-XrM33	U-234	0.038 +/- 0.002 Bq/sample		
MAPEP-15-XrM33	U-238	0.117 +/- 0.004 Bq/sample		
MAPEP-15-XrM33	Zn-65	1.15 +/- 0.04 Bq/sample	1.021 +/- 0.061 Bq/sample	-11.2

Radiological Reference Date: August 1, 2015

MAPEP Mixed Analyte Performance Evaluation Program

Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-15-XrM33
(SANC99) RadioAnalysis, South Africa Nuclear Energy Corp.
Sample Receipt Gate 1
Pretoria, Gauteng 0001

Radiological

Sample ID	Nuclide	Known Activity	Expt'l Activity	Bias (%)
MAPEP-15-XrM33	Am-241	0.077 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Cs-134	1.37 +/- 0.04 Bq/sample	1.35 +/- 0.08 Bq/sample	-1.5
MAPEP-15-XrM33	Cs-137	2.01 +/- 0.05 Bq/sample	2.35 +/- 0.14 Bq/sample	16.9
MAPEP-15-XrM33	Co-57	2.43 +/- 0.07 Bq/sample	4.61 +/- 0.46 Bq/sample	89.7
MAPEP-15-XrM33	Co-60	1.56 +/- 0.06 Bq/sample	1.60 +/- 0.07 Bq/sample	2.6
MAPEP-15-XrM33	Cm-244	0.105 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Ir-192	4.76 +/- 0.15 Bq/sample		
MAPEP-15-XrM33	Mn-54	1.64 +/- 0.05 Bq/sample	2.94 +/- 0.15 Bq/sample	79.3
MAPEP-15-XrM33	Pu-238	0.098 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Pu-239	0.077 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Sr-90	1.19 +/- 0.04 Bq/sample		
MAPEP-15-XrM33	Tc-99	1.11 +/- 0.03 Bq/sample		
MAPEP-15-XrM33	Th-228	0.0155 +/- 0.0014 Bq/sample		
MAPEP-15-XrM33	Th-230	0.0272 +/- 0.0018 Bq/sample		
MAPEP-15-XrM33	Th-232	0.0161 +/- 0.0018 Bq/sample		
MAPEP-15-XrM33	U-234	0.038 +/- 0.002 Bq/sample		
MAPEP-15-XrM33	U-238	0.117 +/- 0.004 Bq/sample		
MAPEP-15-XrM33	Zn-65	1.15 +/- 0.04 Bq/sample	2.44 +/- 0.10 Bq/sample	112.2

Radiological Reference Date: August 1, 2015

Mixed Analyte Performance Evaluation Program

Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-15-XrM33
(SEML01) SRS Environmental Monitoring Laboratory
Bldg 735-B
Aiken, SC 29808

Radiological

Sample ID	Nuclide	Known Activity	Expt'l Activity	Bias (%)
MAPEP-15-XrM33	Am-241	0.077 +/- 0.003 Bq/sample	0.073 +/- 0.0058 Bq/sample	-5.2
MAPEP-15-XrM33	Cs-134	1.37 +/- 0.04 Bq/sample	1.67 +/- 0.15 Bq/sample	21.9
MAPEP-15-XrM33	Cs-137	2.01 +/- 0.05 Bq/sample	2.10 +/- 0.16 Bq/sample	4.5
MAPEP-15-XrM33	Co-57	2.43 +/- 0.07 Bq/sample	2.56 +/- 0.19 Bq/sample	5.4
MAPEP-15-XrM33	Co-60	1.56 +/- 0.06 Bq/sample	1.64 +/- 0.11 Bq/sample	5.1
MAPEP-15-XrM33	Cm-244	0.105 +/- 0.003 Bq/sample	0.093 +/- 0.0074 Bq/sample	-11.4
MAPEP-15-XrM33	Ir-192	4.76 +/- 0.15 Bq/sample		
MAPEP-15-XrM33	Mn-54	1.64 +/- 0.05 Bq/sample	1.77 +/- 0.30 Bq/sample	7.9
MAPEP-15-XrM33	Pu-238	0.098 +/- 0.003 Bq/sample	0.101 +/- 0.0081 Bq/sample	3.1
MAPEP-15-XrM33	Pu-239	0.077 +/- 0.003 Bq/sample	0.075 +/- 0.0060 Bq/sample	-2.6
MAPEP-15-XrM33	K-40		1.55 +/- 1.32 Bq/sample	
MAPEP-15-XrM33	Sr-90	1.19 +/- 0.04 Bq/sample	1.065 +/- 0.064 Bq/sample	-10.5
MAPEP-15-XrM33	Tc-99	1.11 +/- 0.03 Bq/sample		
MAPEP-15-XrM33	Th-228	0.0155 +/- 0.0014 Bq/sample		
MAPEP-15-XrM33	Th-230	0.0272 +/- 0.0018 Bq/sample		
MAPEP-15-XrM33	Th-232	0.0161 +/- 0.0018 Bq/sample		
MAPEP-15-XrM33	U-234	0.038 +/- 0.002 Bq/sample	0.037 +/- 0.0030 Bq/sample	-2.6
MAPEP-15-XrM33	U-238	0.117 +/- 0.004 Bq/sample	0.115 +/- 0.0092 Bq/sample	-1.7
MAPEP-15-XrM33	Zn-65	1.15 +/- 0.04 Bq/sample	1.28 +/- 0.21 Bq/sample	11.3

Radiological Reference Date: August 1, 2015

Mixed Analyte Performance Evaluation Program

Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-15-XrM33
(SRPD01) Sandia National Laboratories, Radiation Protection Sample Diagnostics
PO Box 5800, MS1103
Albuquerque, NM 87185-1103

Radiological

Sample ID	Nuclide	Known Activity	Expt'l Activity	Bias (%)
MAPEP-15-XrM33	Am-241	0.077 +/- 0.003 Bq/sample	0.07 +/- 0.03 Bq/sample	-9.1
MAPEP-15-XrM33	Cs-134	1.37 +/- 0.04 Bq/sample	1.55 +/- 0.13 Bq/sample	13.1
MAPEP-15-XrM33	Cs-137	2.01 +/- 0.05 Bq/sample	1.83 +/- 0.13 Bq/sample	-9.0
MAPEP-15-XrM33	Co-57	2.43 +/- 0.07 Bq/sample	2.15 +/- 0.15 Bq/sample	-11.5
MAPEP-15-XrM33	Co-60	1.56 +/- 0.06 Bq/sample	1.44 +/- 0.11 Bq/sample	-7.7
MAPEP-15-XrM33	Cm-244	0.105 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Ir-192	4.76 +/- 0.15 Bq/sample	4.41 +/- 0.32 Bq/sample	-7.4
MAPEP-15-XrM33	Mn-54	1.64 +/- 0.05 Bq/sample	1.56 +/- 0.12 Bq/sample	-4.9
MAPEP-15-XrM33	Pu-238	0.098 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Pu-239	0.077 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	K-40		1.62 +/- 0.46 Bq/sample	
MAPEP-15-XrM33	Sr-90	1.19 +/- 0.04 Bq/sample		
MAPEP-15-XrM33	Tc-99	1.11 +/- 0.03 Bq/sample		
MAPEP-15-XrM33	Th-228	0.0155 +/- 0.0014 Bq/sample		
MAPEP-15-XrM33	Th-230	0.0272 +/- 0.0018 Bq/sample		
MAPEP-15-XrM33	Th-232	0.0161 +/- 0.0018 Bq/sample		
MAPEP-15-XrM33	U-234	0.038 +/- 0.002 Bq/sample		
MAPEP-15-XrM33	U-238	0.117 +/- 0.004 Bq/sample		
MAPEP-15-XrM33	Zn-65	1.15 +/- 0.04 Bq/sample	1.10 +/- 0.12 Bq/sample	-4.3

Radiological Reference Date: August 1, 2015

MAPEP Mixed Analyte Performance Evaluation Program

Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-15-XrM33
(UPVL99) Lab Radiactividad Ambiental. Univ. Politecnica Valencia
CAMINO DE VERA, 14
VALENCIA, VALENCIA 46022

Radiological

Sample ID	Nuclide	Known Activity	Expt'l Activity	Bias (%)
MAPEP-15-XrM33	Am-241	0.077 +/- 0.003 Bq/sample	0.063 +/- 0.014 Bq/sample	-18.2
MAPEP-15-XrM33	Cs-134	1.37 +/- 0.04 Bq/sample	1.3 +/- 0.06 Bq/sample	-5.1
MAPEP-15-XrM33	Cs-137	2.01 +/- 0.05 Bq/sample	1.57 +/- 0.05 Bq/sample	-21.9
MAPEP-15-XrM33	Co-57	2.43 +/- 0.07 Bq/sample	2.06 +/- 0.08 Bq/sample	-15.2
MAPEP-15-XrM33	Co-60	1.56 +/- 0.06 Bq/sample	1.37 +/- 0.06 Bq/sample	-12.2
MAPEP-15-XrM33	Cm-244	0.105 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Ir-192	4.76 +/- 0.15 Bq/sample	2.8 +/- 0.1 Bq/sample	-41.2
MAPEP-15-XrM33	Mn-54	1.64 +/- 0.05 Bq/sample	1.11 +/- 0.05 Bq/sample	-32.3
MAPEP-15-XrM33	Pu-238	0.098 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Pu-239	0.077 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Sr-90	1.19 +/- 0.04 Bq/sample		
MAPEP-15-XrM33	Tc-99	1.11 +/- 0.03 Bq/sample		
MAPEP-15-XrM33	Th-228	0.0155 +/- 0.0014 Bq/sample		
MAPEP-15-XrM33	Th-230	0.0272 +/- 0.0018 Bq/sample		
MAPEP-15-XrM33	Th-232	0.0161 +/- 0.0018 Bq/sample		
MAPEP-15-XrM33	U-234	0.038 +/- 0.002 Bq/sample		
MAPEP-15-XrM33	U-238	0.117 +/- 0.004 Bq/sample		
MAPEP-15-XrM33	Zn-65	1.15 +/- 0.04 Bq/sample	1.01 +/- 0.06 Bq/sample	-12.2

Radiological Reference Date: August 1, 2015

MAPEP Mixed Analyte Performance Evaluation Program

Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-15-XrM33
(ZIOS99) ZVD Institute of Occupational Safety
Chengdujska Cesta 25
Ljubljana-Polje, Slovenia SI-1260

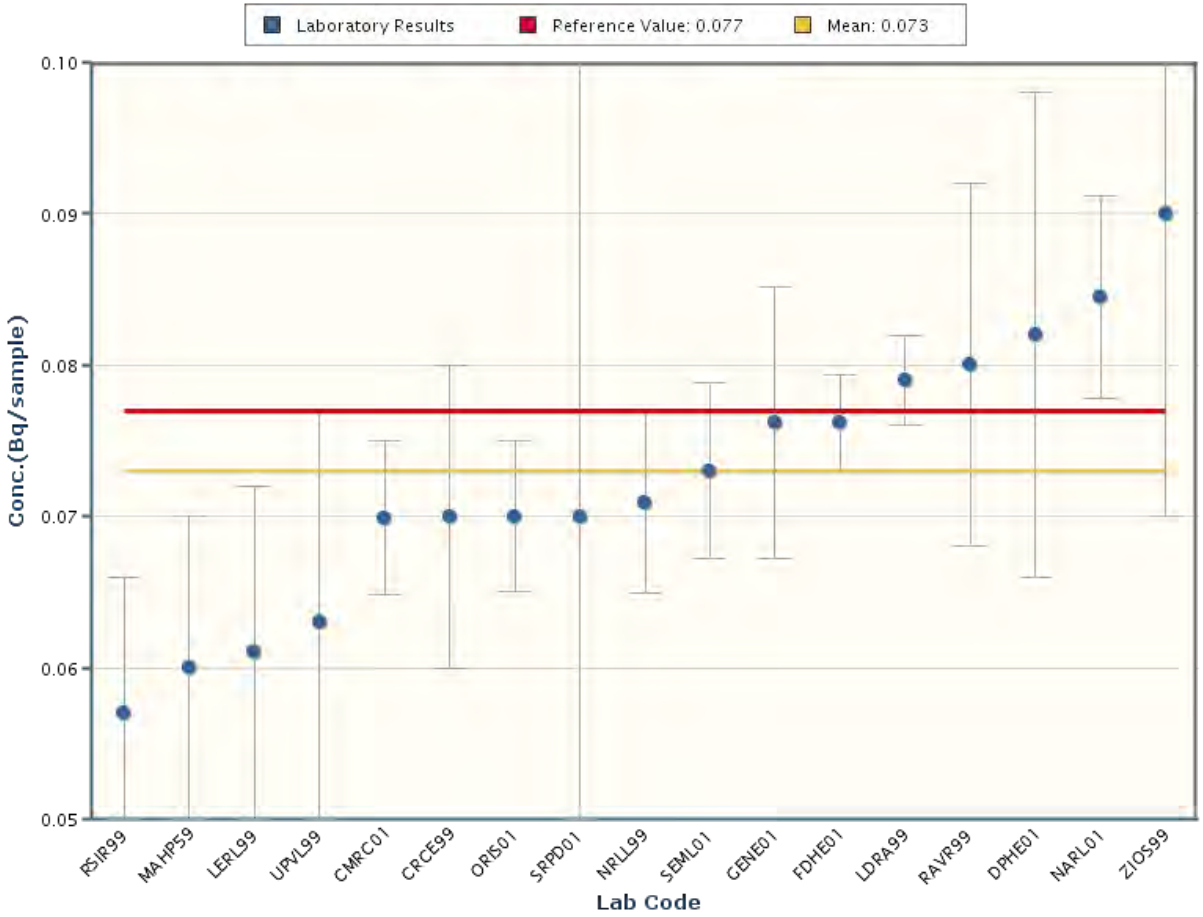
Radiological

Sample ID	Nuclide	Known Activity	Expt'l Activity	Bias (%)
MAPEP-15-XrM33	Am-241	0.077 +/- 0.003 Bq/sample	0.09 +/- 0.02 Bq/sample	16.9
MAPEP-15-XrM33	Cs-134	1.37 +/- 0.04 Bq/sample	1.41 +/- 0.08 Bq/sample	2.9
MAPEP-15-XrM33	Cs-137	2.01 +/- 0.05 Bq/sample	2.07 +/- 0.21 Bq/sample	3.0
MAPEP-15-XrM33	Co-57	2.43 +/- 0.07 Bq/sample	2.65 +/- 0.40 Bq/sample	9.1
MAPEP-15-XrM33	Co-60	1.56 +/- 0.06 Bq/sample	1.61 +/- 0.15 Bq/sample	3.2
MAPEP-15-XrM33	Cm-244	0.105 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Ir-192	4.76 +/- 0.15 Bq/sample	4.81 +/- 0.33 Bq/sample	1.1
MAPEP-15-XrM33	Mn-54	1.64 +/- 0.05 Bq/sample	1.63 +/- 0.40 Bq/sample	-0.6
MAPEP-15-XrM33	Pu-238	0.098 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Pu-239	0.077 +/- 0.003 Bq/sample		
MAPEP-15-XrM33	Sr-90	1.19 +/- 0.04 Bq/sample		
MAPEP-15-XrM33	Tc-99	1.11 +/- 0.03 Bq/sample		
MAPEP-15-XrM33	Th-228	0.0155 +/- 0.0014 Bq/sample		
MAPEP-15-XrM33	Th-230	0.0272 +/- 0.0018 Bq/sample		
MAPEP-15-XrM33	Th-232	0.0161 +/- 0.0018 Bq/sample		
MAPEP-15-XrM33	U-234	0.038 +/- 0.002 Bq/sample		
MAPEP-15-XrM33	U-238	0.117 +/- 0.004 Bq/sample		
MAPEP-15-XrM33	Zn-65	1.15 +/- 0.04 Bq/sample	1.17 +/- 0.09 Bq/sample	1.7

Radiological Reference Date: August 1, 2015

Americium-241

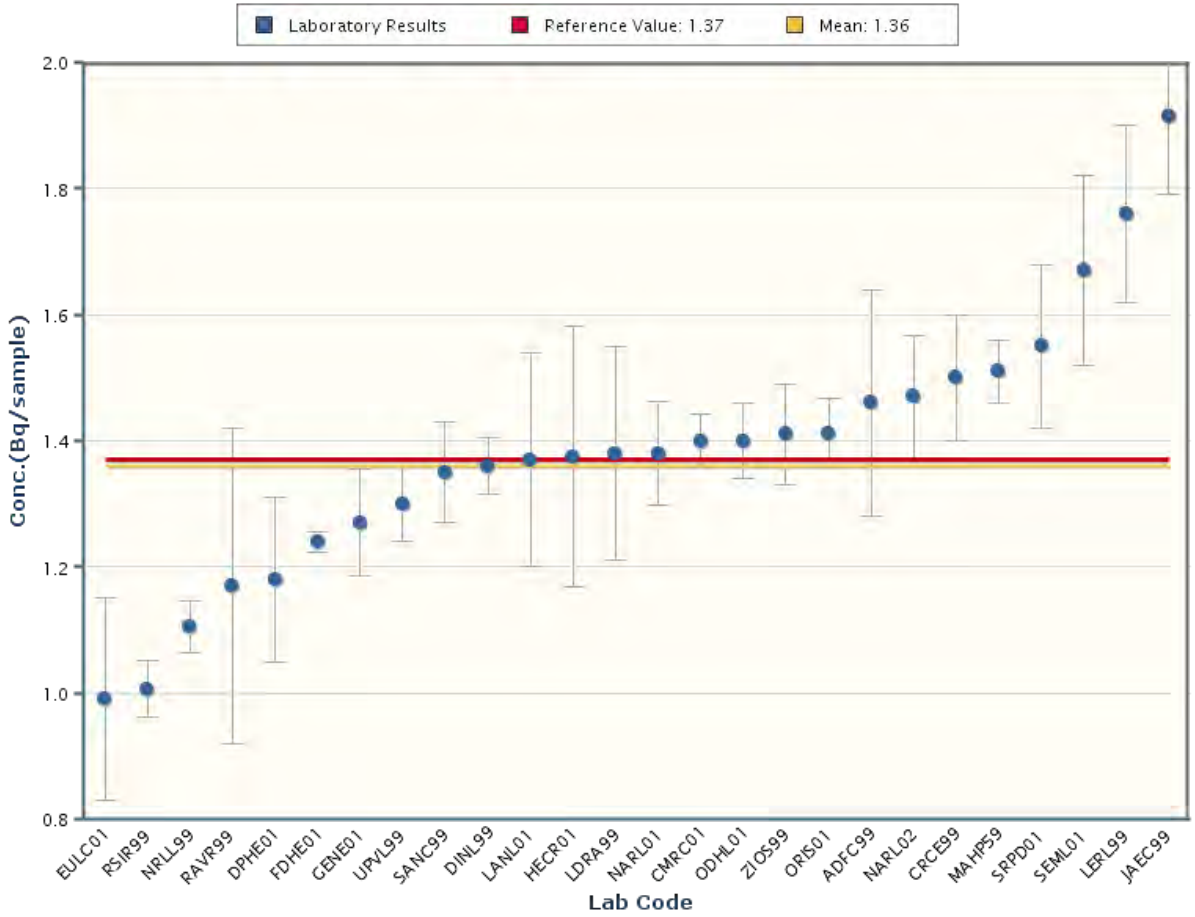
MAPEP-15-XrM33



Notes:
The chart mean excludes values outside of a bias range of ± 30%.
The chart shows only data points with values between 0.027 and 0.118 (± 5 Standard Deviations).
The error bars encompassing each result are plotted at ± one standard deviation.

Cesium-134

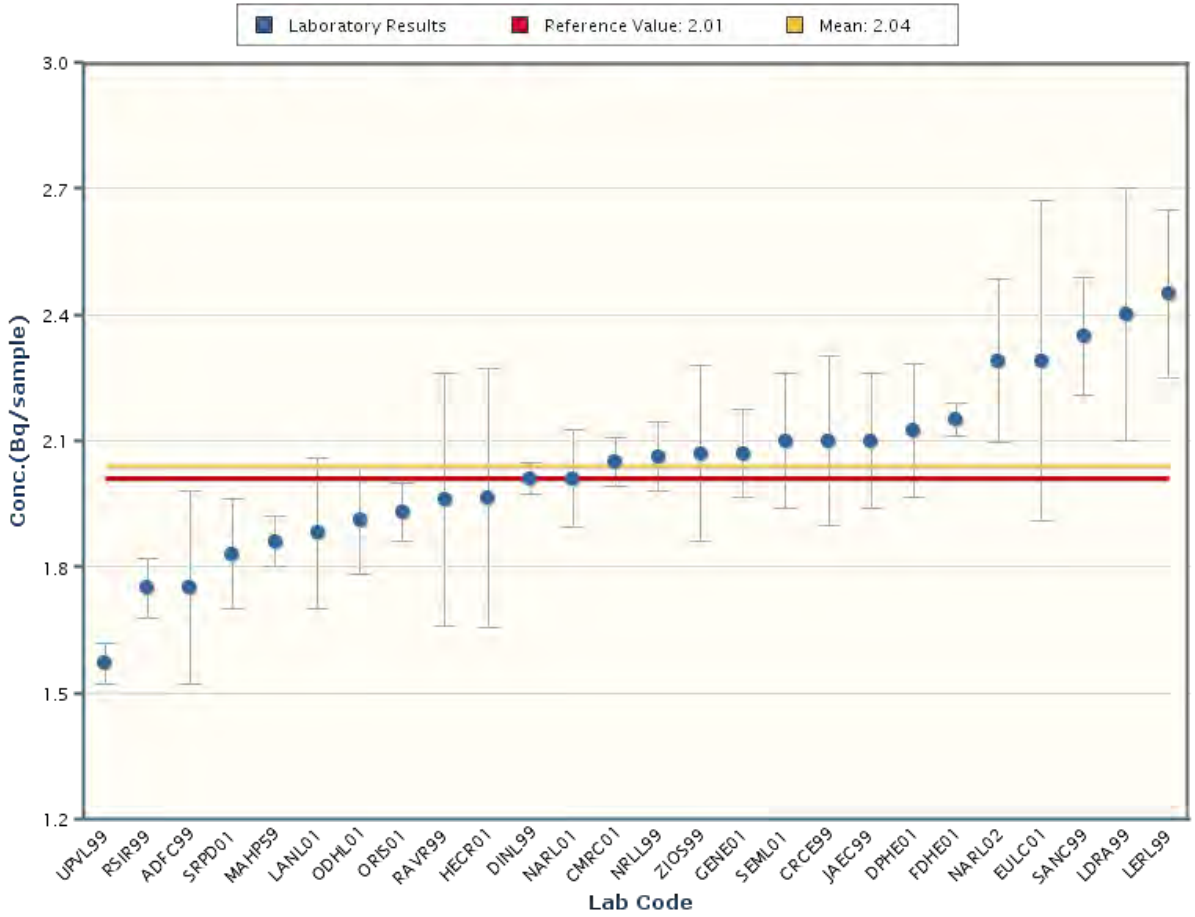
MAPEP-15-XrM33



Notes:
The chart mean excludes values outside of a bias range of ± 30%.
The chart shows only data points with values between 0.45 and 2.27 (± 5 Standard Deviations).
The error bars encompassing each result are plotted at ± one standard deviation.

Cesium-137

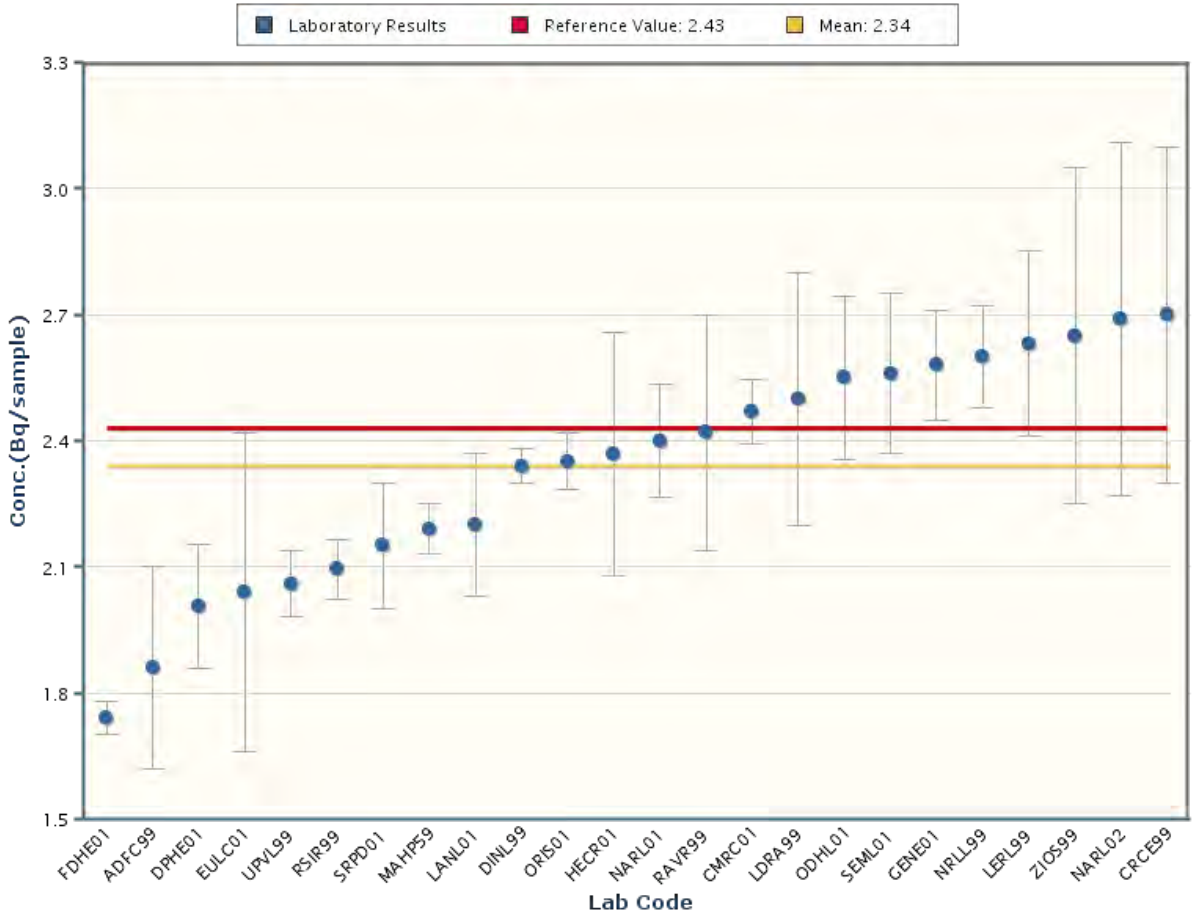
MAPEP-15-XrM33



Notes:
The chart mean excludes values outside of a bias range of ± 30%.
The chart shows only data points with values between 1.00 and 3.08 (± 5 Standard Deviations).
The error bars encompassing each result are plotted at ± one standard deviation.

Cobalt-57

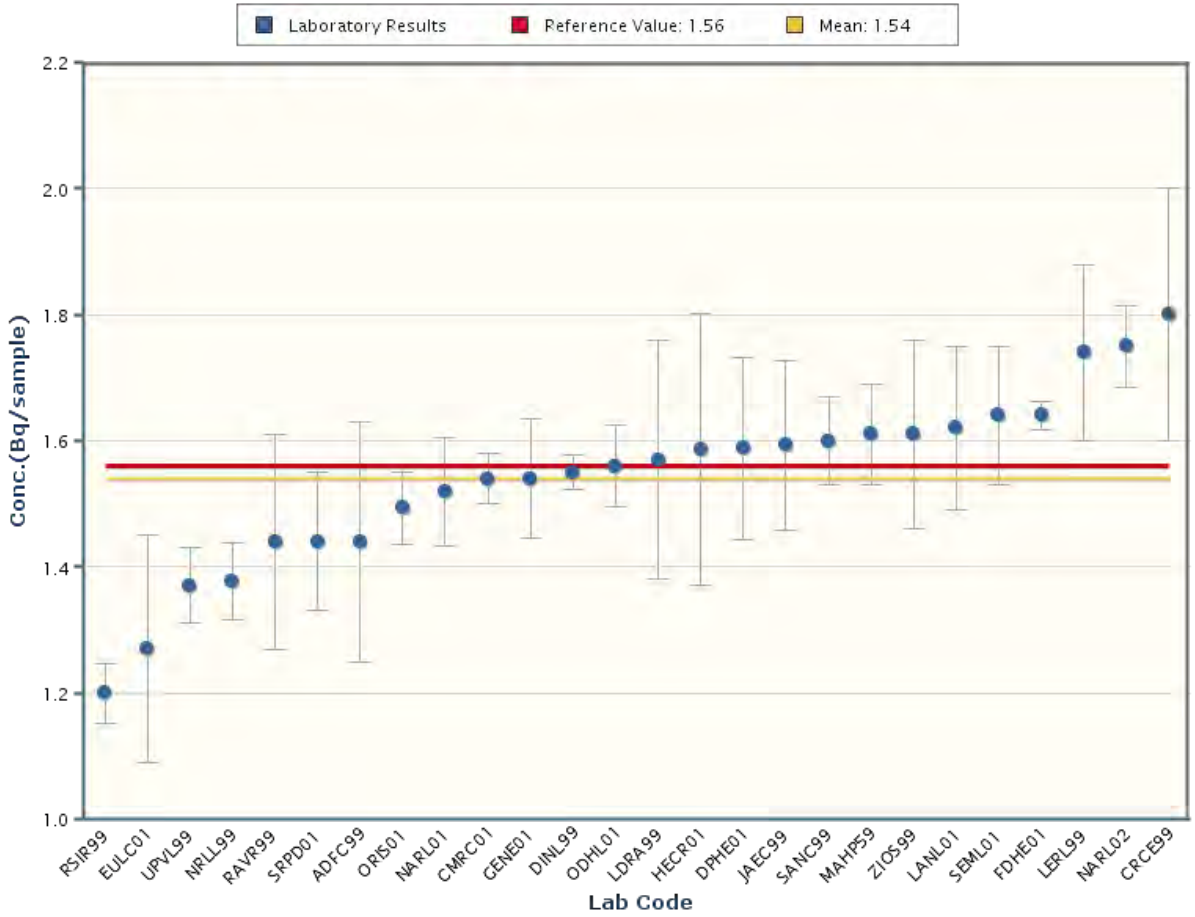
MAPEP-15-XrM33



Notes:
The chart mean excludes values outside of a bias range of ± 30%.
The chart shows only data points with values between 0.98 and 3.70 (± 5 Standard Deviations).
The error bars encompassing each result are plotted at ± one standard deviation.

Cobalt-60

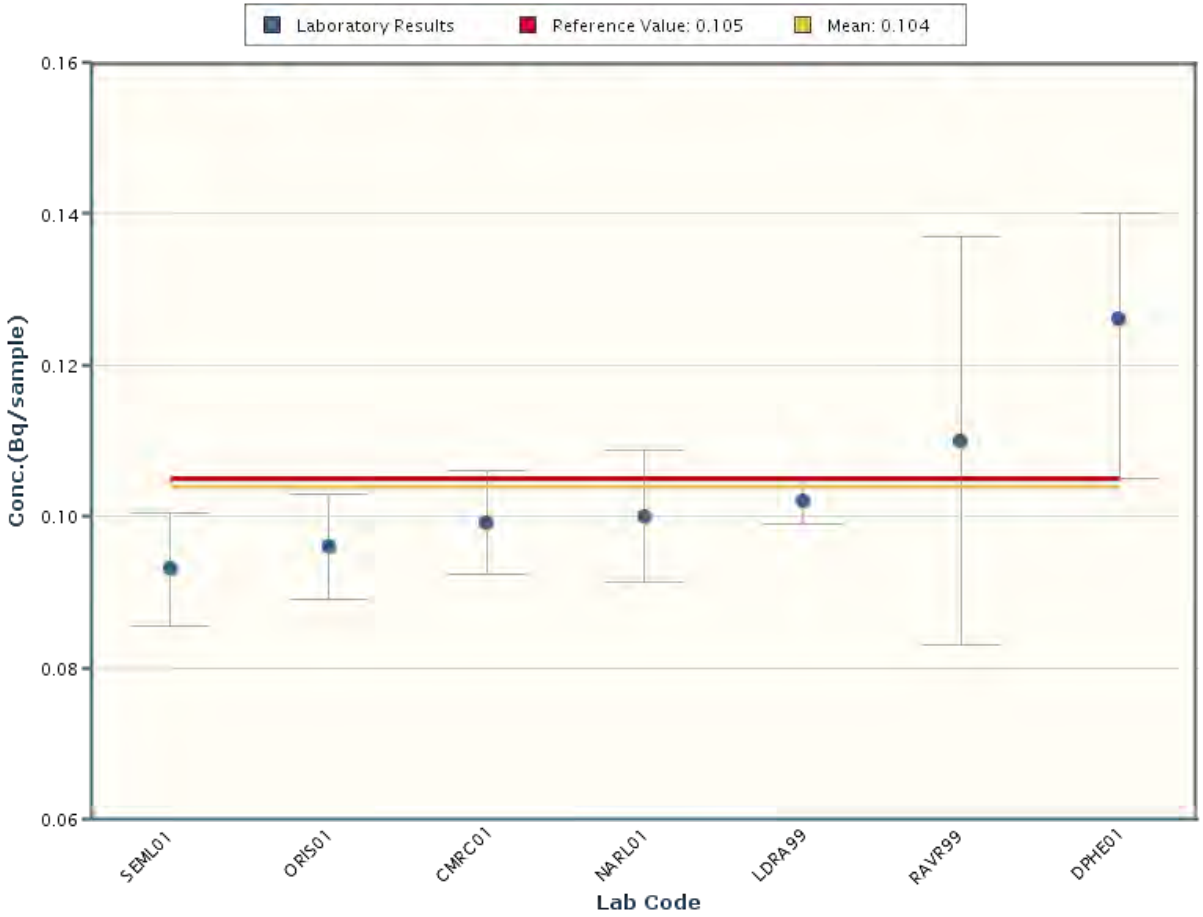
MAPEP-15-XrM33



Notes:
The chart mean excludes values outside of a bias range of ± 30%.
The chart shows only data points with values between 0.85 and 2.23 (± 5 Standard Deviations).
The error bars encompassing each result are plotted at ± one standard deviation.

Curium-244

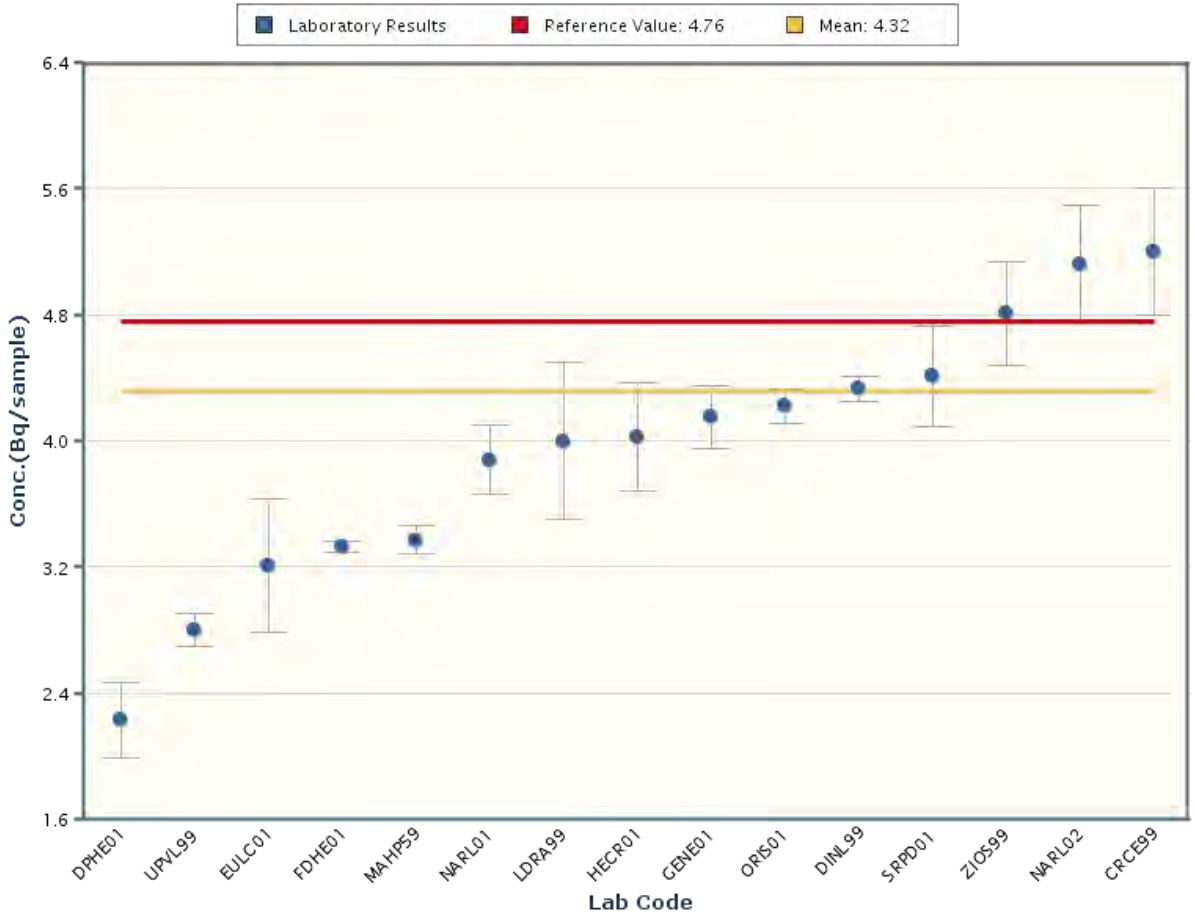
MAPEP-15-XrM33



Notes:
The chart mean excludes values outside of a bias range of ± 30%.
The chart shows only data points with values between 0.048 and 0.160 (± 5 Standard Deviations).
The error bars encompassing each result are plotted at ± one standard deviation.

Iridium-192

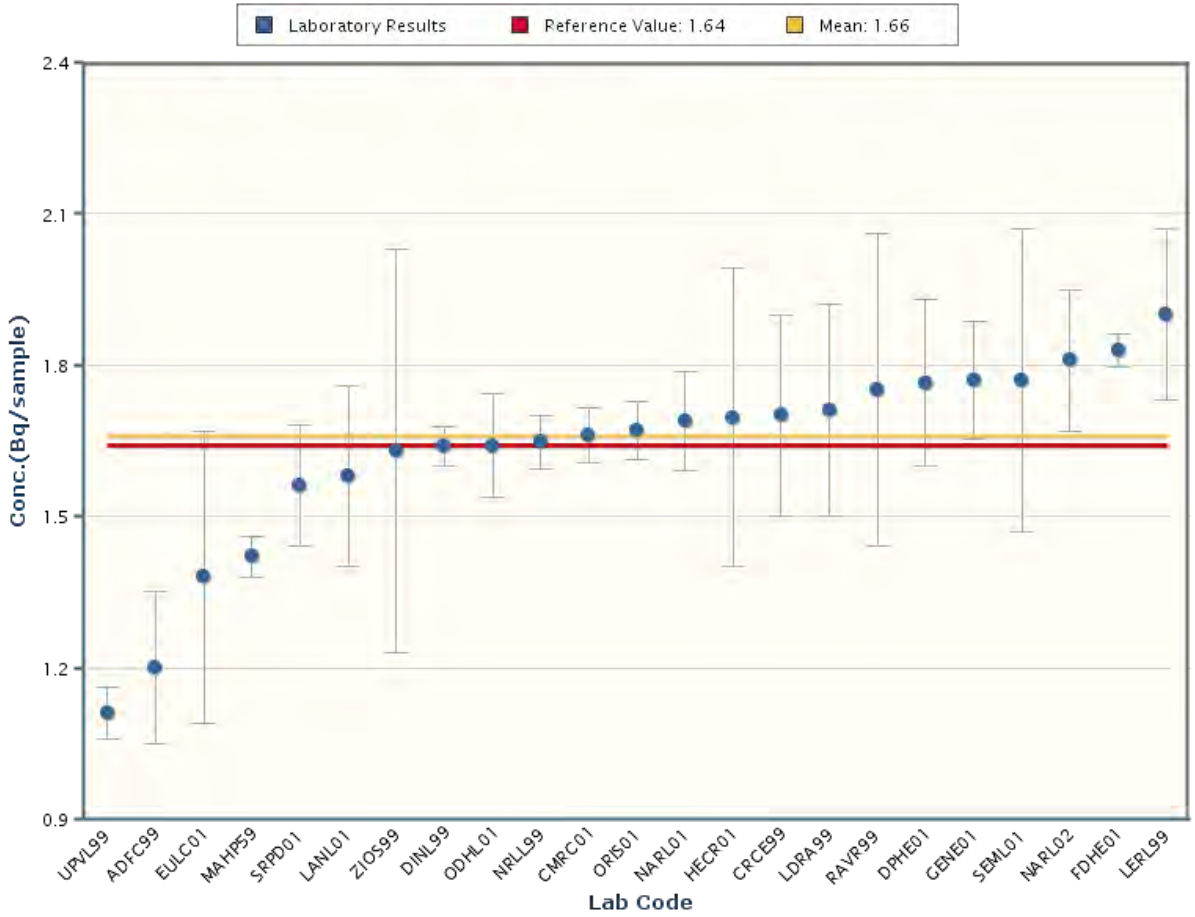
MAPEP-15-XrM33



Notes:
The chart mean excludes values outside of a bias range of ± 30%.
The chart shows only data points with values between 1.59 and 7.05 (± 5 Standard Deviations).
The error bars encompassing each result are plotted at ± one standard deviation.

Manganese-54

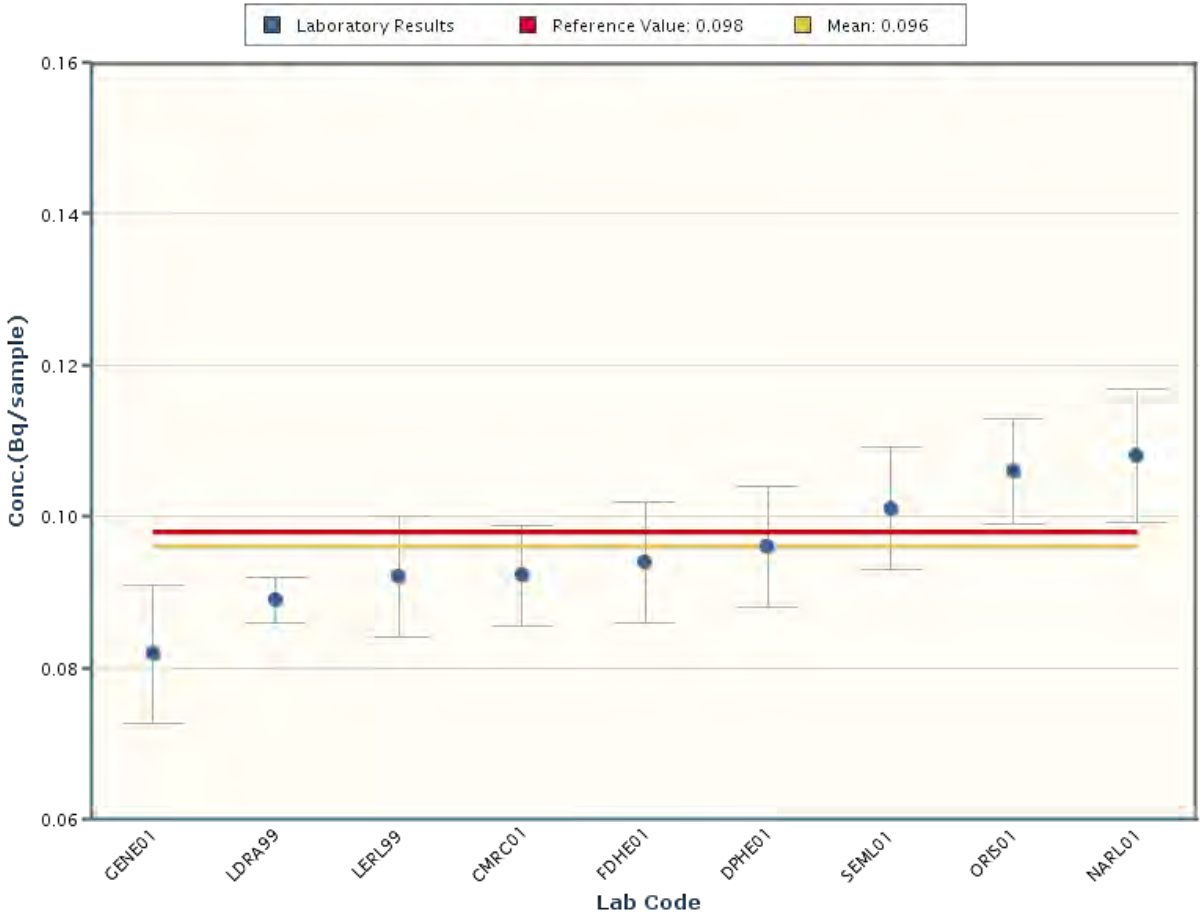
MAPEP-15-XrM33



Notes:
The chart mean excludes values outside of a bias range of ± 30%.
The chart shows only data points with values between 0.87 and 2.45 (± 5 Standard Deviations).
The error bars encompassing each result are plotted at ± one standard deviation.

Plutonium-238

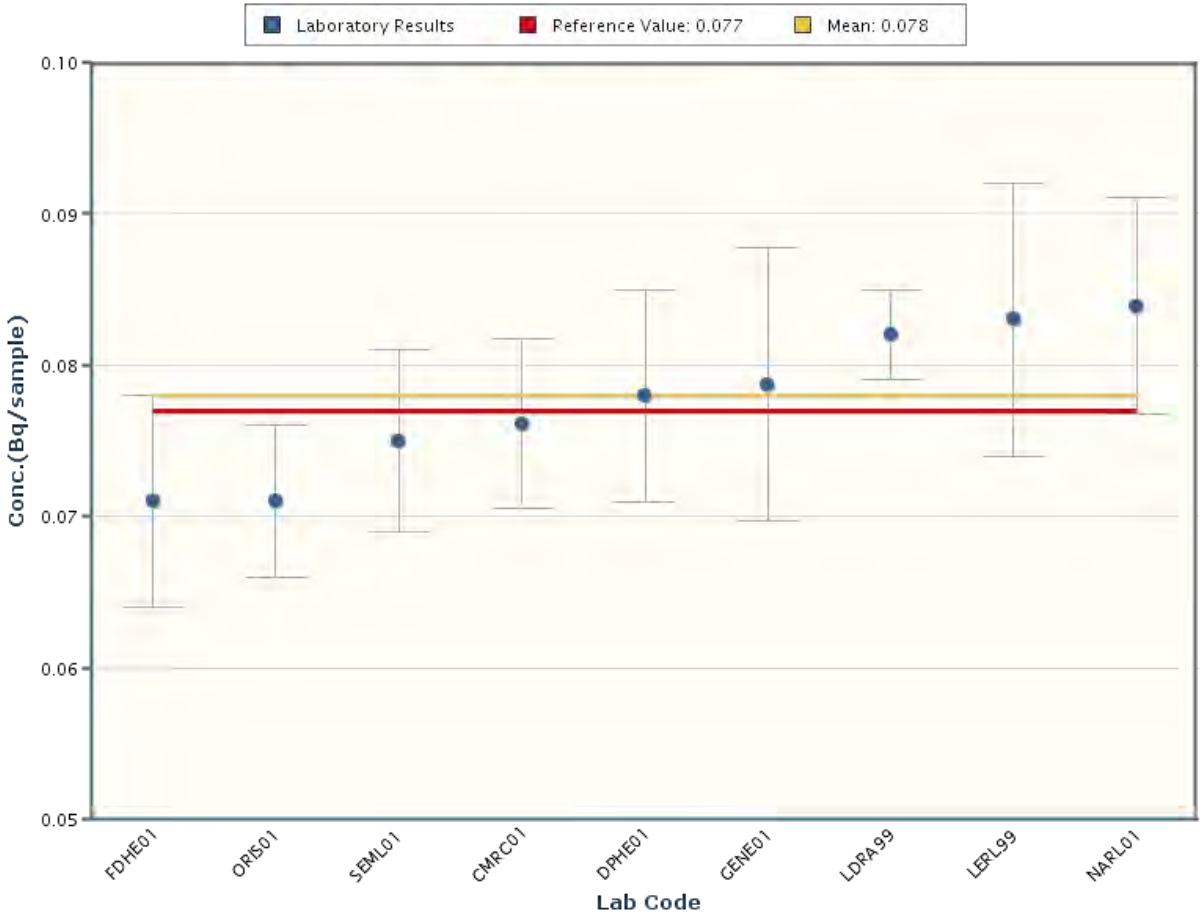
MAPEP-15-XrM33



Notes:
The chart mean excludes values outside of a bias range of ± 30%.
The chart shows only data points with values between 0.054 and 0.137 (± 5 Standard Deviations).
The error bars encompassing each result are plotted at ± one standard deviation.

Plutonium-239/240

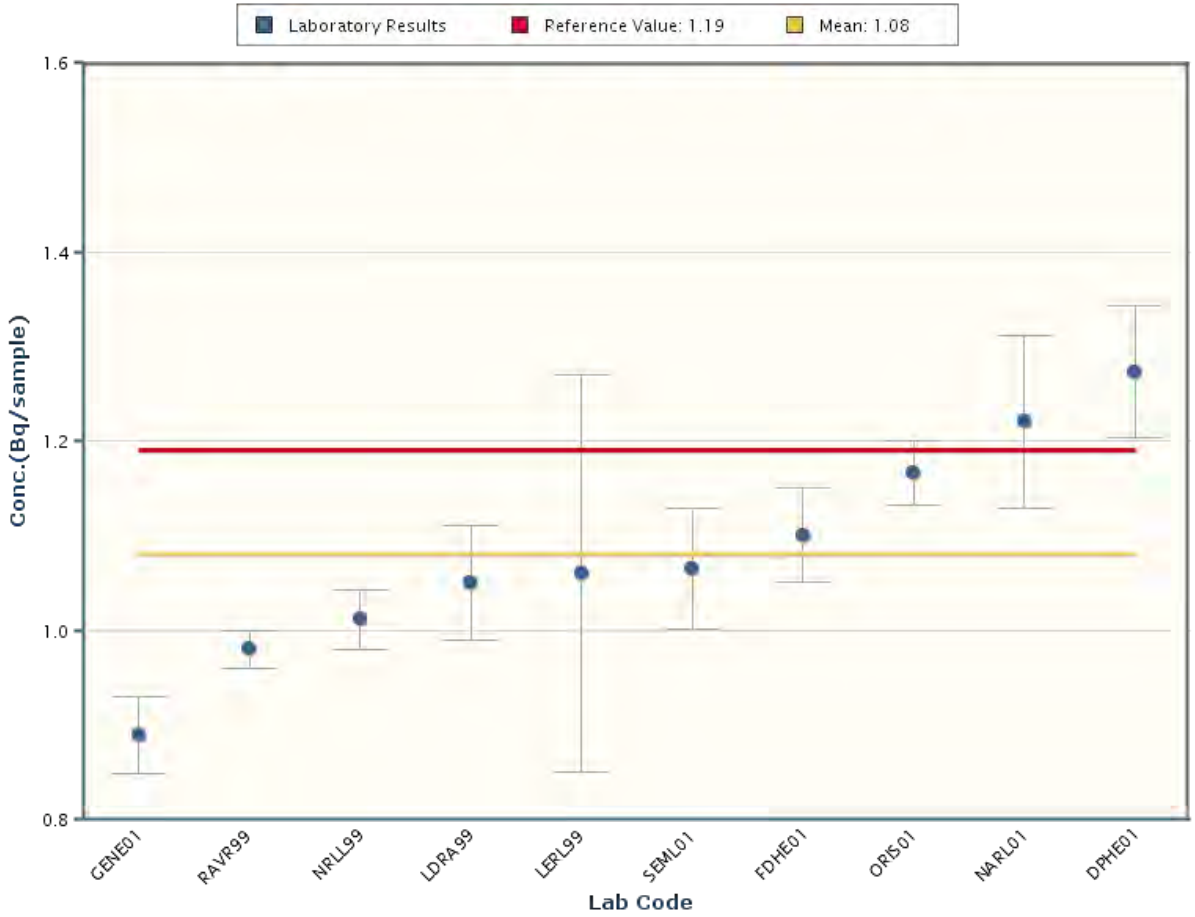
MAPEP-15-XrM33



Notes:
The chart mean excludes values outside of a bias range of ± 30%.
The chart shows only data points with values between 0.054 and 0.102 (± 5 Standard Deviations).
The error bars encompassing each result are plotted at ± one standard deviation.

Strontium-90

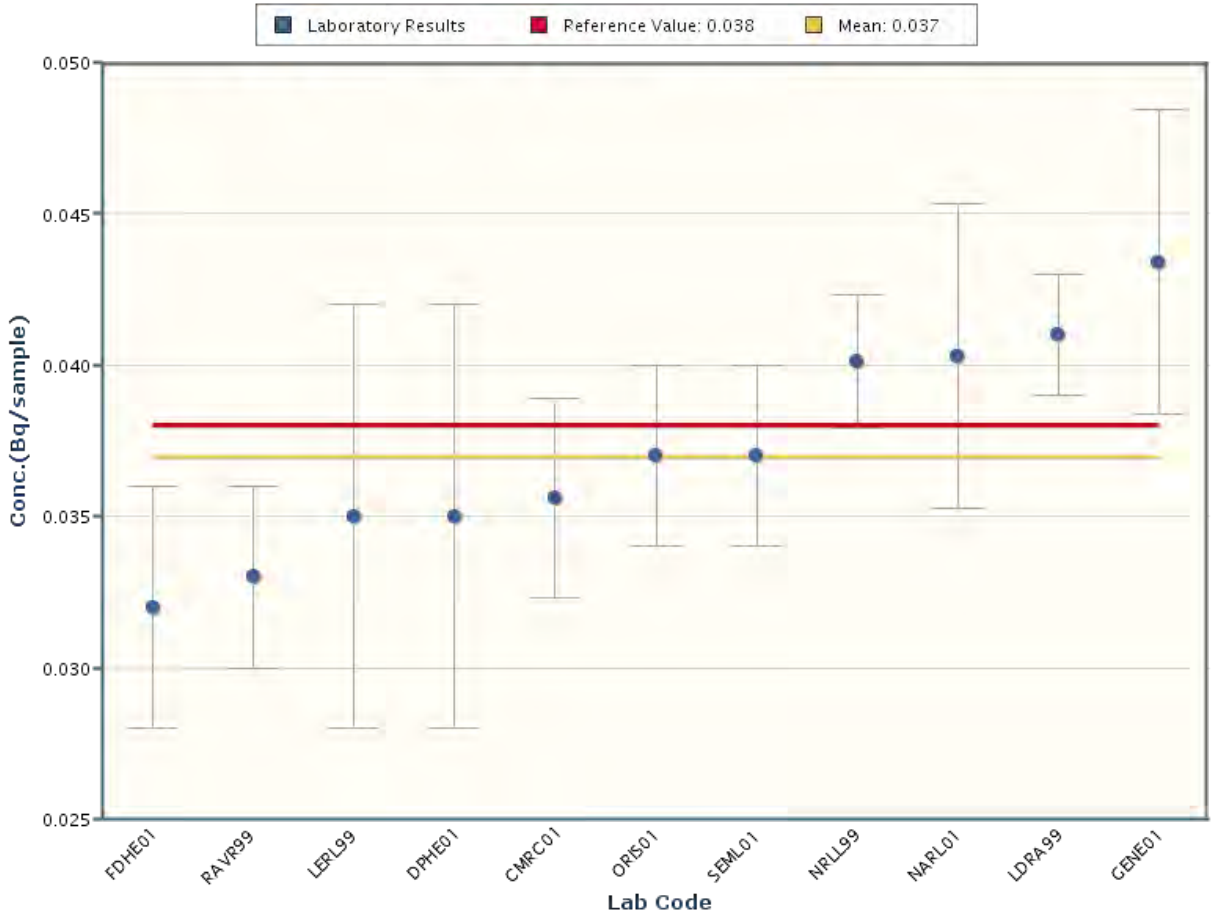
MAPEP-15-XrM33



Notes:
The chart mean excludes values outside of a bias range of ± 30%.
The chart shows only data points with values between 0.51 and 1.65 (± 5 Standard Deviations).
The error bars encompassing each result are plotted at ± one standard deviation.

Uranium-234/233

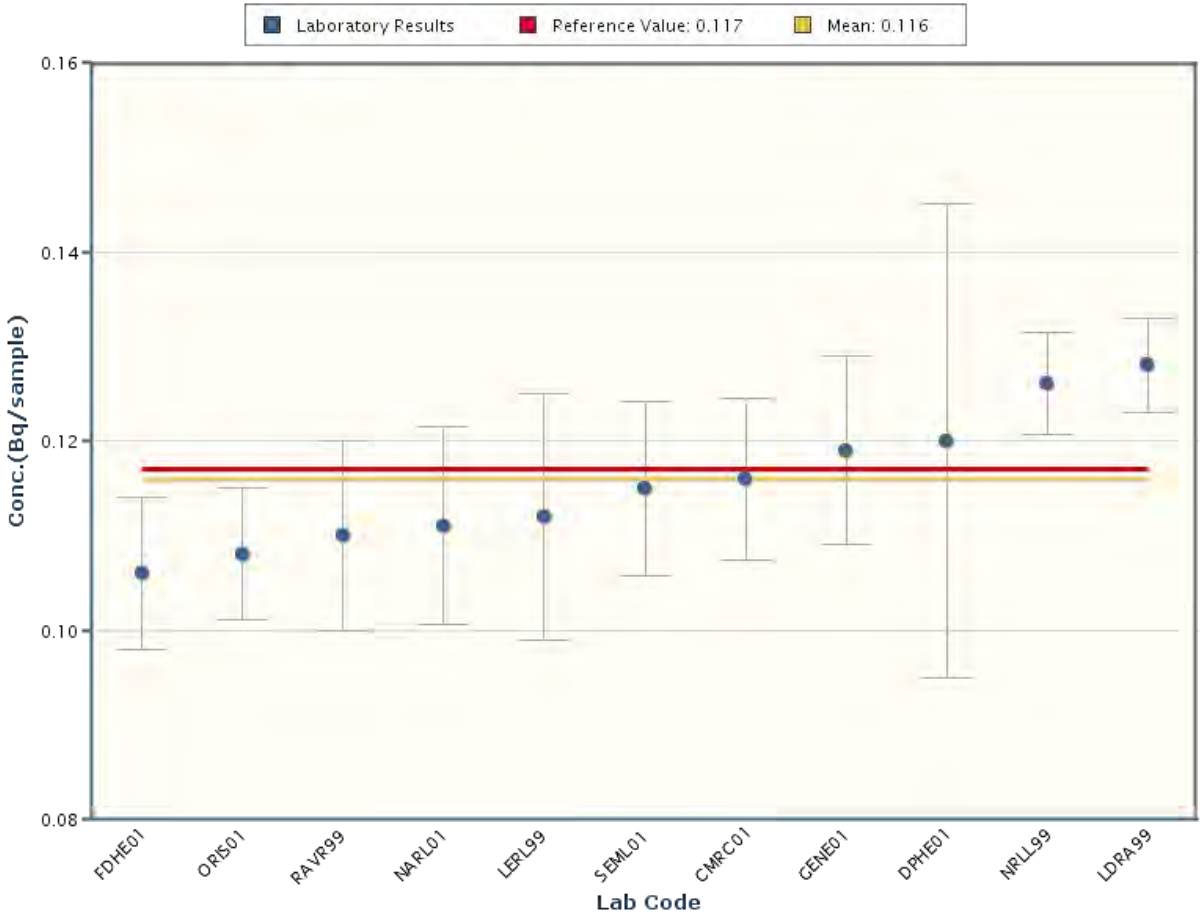
MAPEP-15-XrM33



Notes:
The chart mean excludes values outside of a bias range of ± 30%.
The chart shows only data points with values between 0.019 and 0.055 (± 5 Standard Deviations).
The error bars encompassing each result are plotted at ± one standard deviation.

Uranium-238

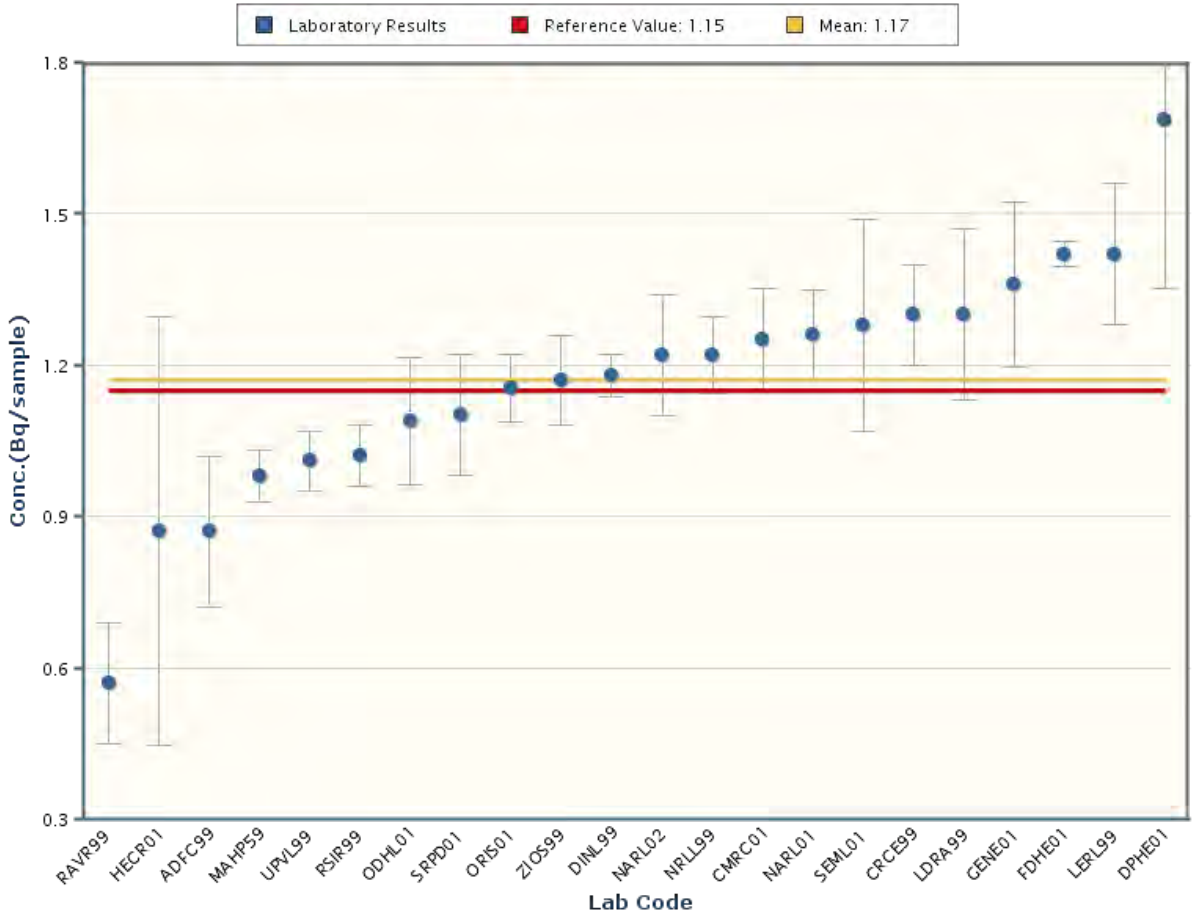
MAPEP-15-XrM33



Notes:
The chart mean excludes values outside of a bias range of ± 30%.
The chart shows only data points with values between 0.080 and 0.151 (± 5 Standard Deviations).
The error bars encompassing each result are plotted at ± one standard deviation.

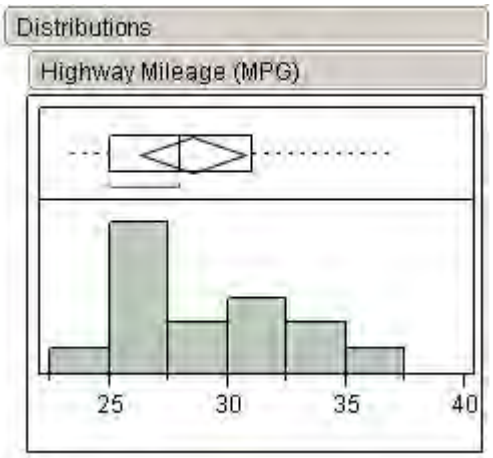
Zinc-65

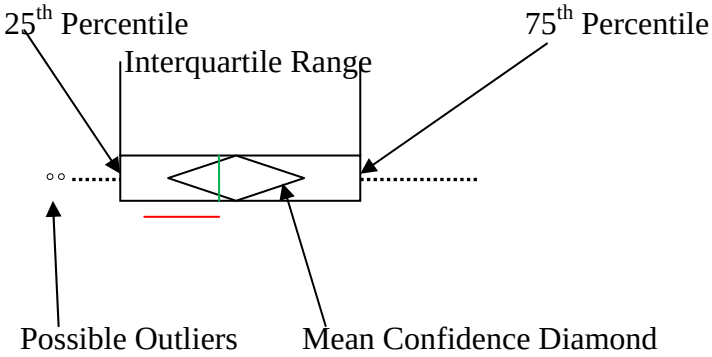
MAPEP-15-XrM33



Notes:
The chart mean excludes values outside of a bias range of ± 30%.
The chart shows only data points with values between 0.36 and 1.99 (± 5 Standard Deviations).
The error bars encompassing each result are plotted at ± one standard deviation.

The intent of the distribution graphs contained within this report is to graphically demonstrate to users how % Bias data within the current MAPEP Series appears when examined by matrix, by analyte, by method of sample preparation or by method of detection. The data points (small 'dots') plot the bias (or z-score for organic constituents) of each of the analytes in each of the matrices. The BLACK small vertical line inside the small rectangle at the top of the data distribution graph is the mean of the population of the bias shown for that analyte in the matrix.





Moments

Mean	28.466667
Std Dev	3.9797104
Std Err Mean	1.0275568
Upper 95% Mean	30.670557
Lower 95% Mean	26.262776
N	15
Sum Wgt	15
Sum	427
Variance	15.838095
Skewness	0.7309964
Kurtosis	-0.165153
CV	13.980247
N Missing	0

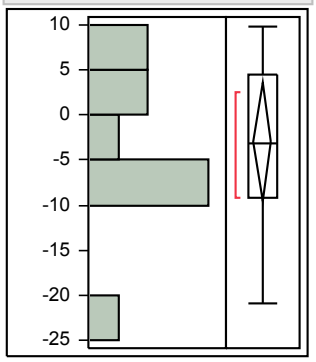
The box plots summarize the distribution of points for each analyte. The ends of the box are the 25th and 75th quantiles. The difference between the quartiles is the interquartile range. The line across the middle of the box identifies the median bias value. Each box has lines, sometimes called whiskers, which extend from each end. The whiskers extend from the ends of the small box to the outermost data point that falls within the distances computed. Any potential outliers are represented as small black dots.

The box plot of the bias data points and the mean visually illustrate the breadth of the distribution and where any potential outliers in the distribution might lie. The moments for the distribution plot are provided below the Bias plot. In some cases, N becomes very small and thus developed statistics may not accurately reflect estimates of the population if N were a significantly larger value.

XrM Distribution by Detection Method

Distributions Analyte_Detection=Americium-241 Alpha Spectrometry

Bias



Quantiles

100.0%	maximum	9.7
99.5%		9.7
97.5%		9.7
90.0%		9.38
75.0%	quartile	4.55
50.0%	median	-3.1
25.0%	quartile	-9.125
10.0%		-19.64
2.5%		-20.8
0.5%		-20.8
0.0%	minimum	-20.8

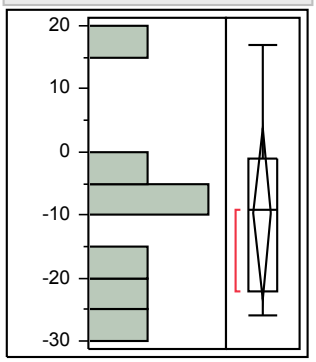
Summary Statistics

Mean	-3.05
Std Dev	9.1640905
Std Err Mean	2.8979399
Upper 95% Mean	3.5055955
Lower 95% Mean	-9.605595
N	10

XrM Distribution by Detection Method

Distributions Analyte_Detection=Americium-241 Gamma Spectrometry

Bias



Quantiles

100.0%	maximum	16.9
99.5%		16.9
97.5%		16.9
90.0%		16.9
75.0%	quartile	-1
50.0%	median	-9.1
25.0%	quartile	-22.1
10.0%		-26
2.5%		-26
0.5%		-26
0.0%	minimum	-26

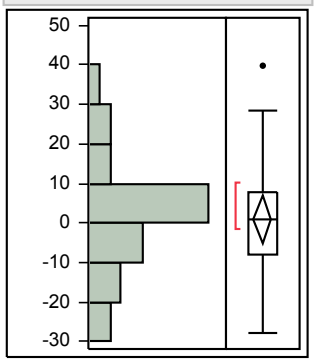
Summary Statistics

Mean	-9.8
Std Dev	14.580809
Std Err Mean	5.5110279
Upper 95% Mean	3.6849995
Lower 95% Mean	-23.285
N	7

XrM Distribution by Detection Method

Distributions Analyte_Detection=Cesium-134 Gamma Spectrometry

Bias



Quantiles

100.0%	maximum	39.8
99.5%		39.8
97.5%		39.8
90.0%		23.88
75.0%	quartile	7.85
50.0%	median	0.7
25.0%	quartile	-7.85
10.0%		-21.49
2.5%		-27.7
0.5%		-27.7
0.0%	minimum	-27.7

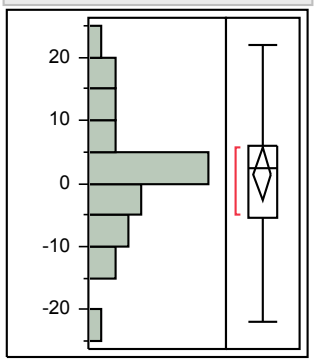
Summary Statistics

Mean	0.8807692
Std Dev	15.196474
Std Err Mean	2.9802737
Upper 95% Mean	7.0187578
Lower 95% Mean	-5.257219
N	26

XrM Distribution by Detection Method

Distributions Analyte_Detection=Cesium-137 Gamma Spectrometry

Bias



Quantiles

100.0%	maximum	21.9
99.5%		21.9
97.5%		21.9
90.0%		17.65
75.0%	quartile	6.025
50.0%	median	2.3
25.0%	quartile	-5.375
10.0%		-12.93
2.5%		-21.9
0.5%		-21.9
0.0%	minimum	-21.9

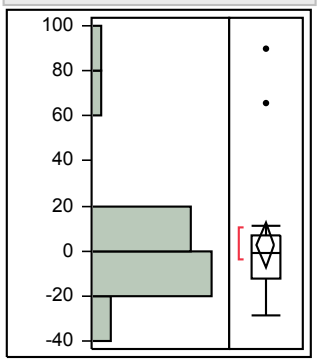
Summary Statistics

Mean	1.4692308
Std Dev	10.372917
Std Err Mean	2.0342965
Upper 95% Mean	5.6589428
Lower 95% Mean	-2.720481
N	26

XrM Distribution by Detection Method

Distributions Analyte_Detection=Cobalt-57 Gamma Spectrometry

Bias



Quantiles

100.0%	maximum	89.7
99.5%		89.7
97.5%		89.7
90.0%		27.45
75.0%	quartile	7.3
50.0%	median	-0.8
25.0%	quartile	-12.075
10.0%		-19.23
2.5%		-28.4
0.5%		-28.4
0.0%	minimum	-28.4

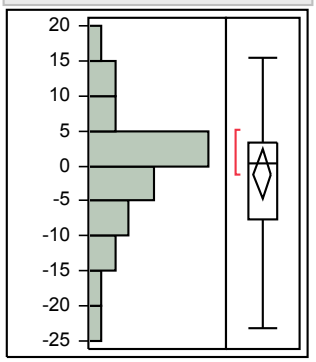
Summary Statistics

Mean	2.5384615
Std Dev	24.830418
Std Err Mean	4.8696456
Upper 95% Mean	12.567684
Lower 95% Mean	-7.490761
N	26

XrM Distribution by Detection Method

Distributions Analyte_Detection=Cobalt-60 Gamma Spectrometry

Bias



Quantiles

100.0%	maximum	15.4
99.5%		15.4
97.5%		15.4
90.0%		11.71
75.0%	quartile	3.35
50.0%	median	0.3
25.0%	quartile	-7.7
10.0%		-14.12
2.5%		-23.1
0.5%		-23.1
0.0%	minimum	-23.1

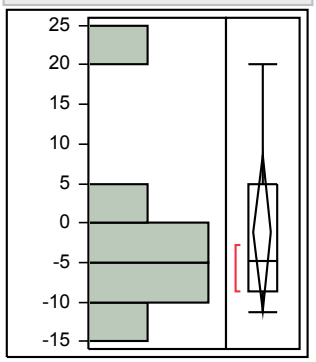
Summary Statistics

Mean	-1.173077
Std Dev	8.8526406
Std Err Mean	1.7361457
Upper 95% Mean	2.402582
Lower 95% Mean	-4.748736
N	26

XrM Distribution by Detection Method

Distributions Analyte_Detection=Curium-244 Alpha Spectrometry

Bias



Quantiles

100.0%	maximum	20
99.5%		20
97.5%		20
90.0%		20
75.0%	quartile	4.8
50.0%	median	-4.8
25.0%	quartile	-8.6
10.0%		-11.4
2.5%		-11.4
0.5%		-11.4
0.0%	minimum	-11.4

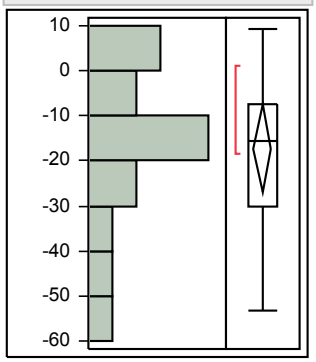
Summary Statistics

Mean	-1.2
Std Dev	10.634692
Std Err Mean	4.0195356
Upper 95% Mean	8.6354494
Lower 95% Mean	-11.03545
N	7

XrM Distribution by Detection Method

Distributions Analyte_Detection=Iridium-192 Gamma Spectrometry

Bias



Quantiles

100.0%	maximum	9.2
99.5%		9.2
97.5%		9.2
90.0%		8.24
75.0%	quartile	-7.4
50.0%	median	-15.5
25.0%	quartile	-30
10.0%		-46
2.5%		-53.2
0.5%		-53.2
0.0%	minimum	-53.2

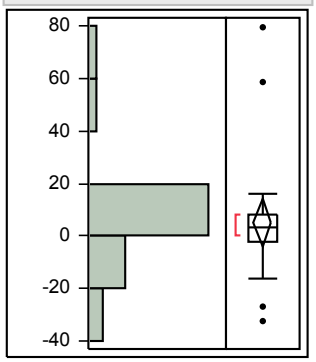
Summary Statistics

Mean	-17.25333
Std Dev	17.499627
Std Err Mean	4.5183843
Upper 95% Mean	-7.562363
Lower 95% Mean	-26.9443
N	15

XrM Distribution by Detection Method

Distributions Analyte_Detection=Manganese-54 Gamma Spectrometry

Bias



Quantiles

100.0%	maximum	79.3
99.5%		79.3
97.5%		79.3
90.0%		32.94
75.0%	quartile	7.9
50.0%	median	3
25.0%	quartile	-2.15
10.0%		-20.26
2.5%		-32.3
0.5%		-32.3
0.0%	minimum	-32.3

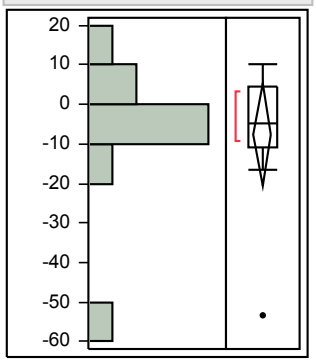
Summary Statistics

Mean	5.044
Std Dev	22.442149
Std Err Mean	4.4884299
Upper 95% Mean	14.307664
Lower 95% Mean	-4.219664
N	25

XrM Distribution by Detection Method

Distributions Analyte_Detection=Plutonium-238 Alpha Spectrometry

Bias



Quantiles

100.0%	maximum	10.2
99.5%		10.2
97.5%		10.2
90.0%		10
75.0%	quartile	4.375
50.0%	median	-5
25.0%	quartile	-11.025
10.0%		-49.71
2.5%		-53.4
0.5%		-53.4
0.0%	minimum	-53.4

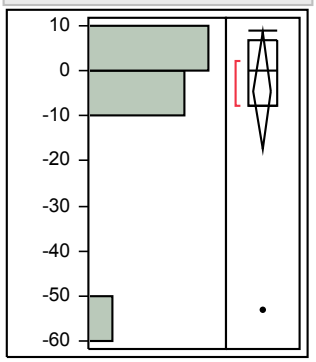
Summary Statistics

Mean	-7.57
Std Dev	17.978756
Std Err Mean	5.6853818
Upper 95% Mean	5.2912273
Lower 95% Mean	-20.43123
N	10

XrM Distribution by Detection Method

Distributions Analyte_Detection=Plutonium-239/240 Alpha Spectrometry

Bias



Quantiles

100.0%	maximum	9
99.5%		9
97.5%		9
90.0%		8.88
75.0%	quartile	6.825
50.0%	median	0.05
25.0%	quartile	-7.8
10.0%		-48.48
2.5%		-53
0.5%		-53
0.0%	minimum	-53

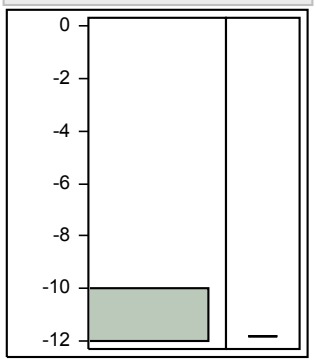
Summary Statistics

Mean	-4.56
Std Dev	18.017165
Std Err Mean	5.6975277
Upper 95% Mean	8.3287032
Lower 95% Mean	-17.4487
N	10

XrM Distribution by Detection Method

Distributions Analyte_Detection=Strontium-90 Alpha Spectrometry

Bias



Quantiles

100.0%	maximum	-11.8
99.5%		-11.8
97.5%		-11.8
90.0%		-11.8
75.0%	quartile	-11.8
50.0%	median	-11.8
25.0%	quartile	-11.8
10.0%		-11.8
2.5%		-11.8
0.5%		-11.8
0.0%	minimum	-11.8

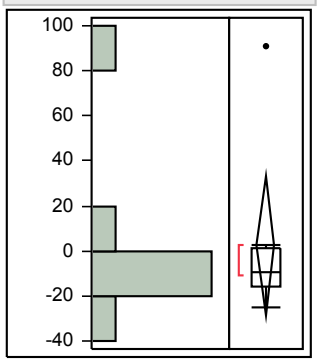
Summary Statistics

Mean	-11.8
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1

XrM Distribution by Detection Method

Distributions Analyte_Detection=Strontium-90 Beta Counting - 2 pi gas flow proportional counter

Bias



Quantiles

100.0%	maximum	90.8
99.5%		90.8
97.5%		90.8
90.0%		90.8
75.0%	quartile	1.375
50.0%	median	-9.05
25.0%	quartile	-15.925
10.0%		-25.3
2.5%		-25.3
0.5%		-25.3
0.0%	minimum	-25.3

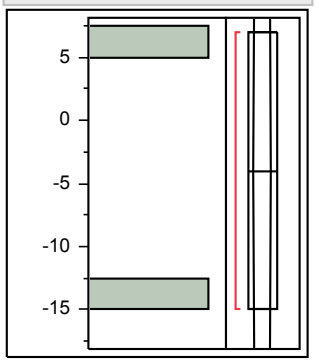
Summary Statistics

Mean	2.425
Std Dev	36.731682
Std Err Mean	12.986611
Upper 95% Mean	33.133454
Lower 95% Mean	-28.28345
N	8

XrM Distribution by Detection Method

Distributions Analyte_Detection=Strontium-90 Beta Counting - liquid scintillation counter

Bias



Quantiles

100.0%	maximum	7
99.5%		7
97.5%		7
90.0%		7
75.0%	quartile	7
50.0%	median	-4
25.0%	quartile	-15
10.0%		-15
2.5%		-15
0.5%		-15
0.0%	minimum	-15

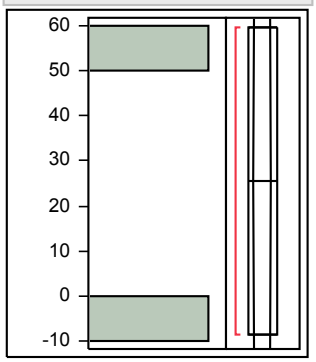
Summary Statistics

Mean	-4
Std Dev	15.556349
Std Err Mean	11
Upper 95% Mean	135.76825
Lower 95% Mean	-143.7683
N	2

XrM Distribution by Detection Method

Distributions Analyte_Detection=Technetium-99 Beta Counting - liquid scintillation counter

Bias



Quantiles

100.0%	maximum	59.5
99.5%		59.5
97.5%		59.5
90.0%		59.5
75.0%	quartile	59.5
50.0%	median	25.45
25.0%	quartile	-8.6
10.0%		-8.6
2.5%		-8.6
0.5%		-8.6
0.0%	minimum	-8.6

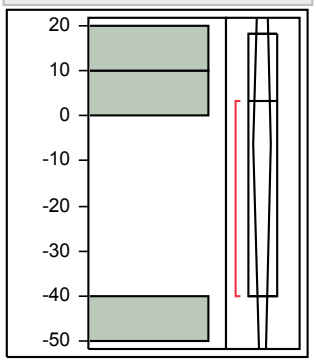
Summary Statistics

Mean	25.45
Std Dev	48.153972
Std Err Mean	34.05
Upper 95% Mean	458.09627
Lower 95% Mean	-407.1963
N	2

XrM Distribution by Detection Method

Distributions Analyte_Detection=Thorium-228 Alpha Spectrometry

Bias



Quantiles

100.0%	maximum	18.1
99.5%		18.1
97.5%		18.1
90.0%		18.1
75.0%	quartile	18.1
50.0%	median	3.2
25.0%	quartile	-40.1
10.0%		-40.1
2.5%		-40.1
0.5%		-40.1
0.0%	minimum	-40.1

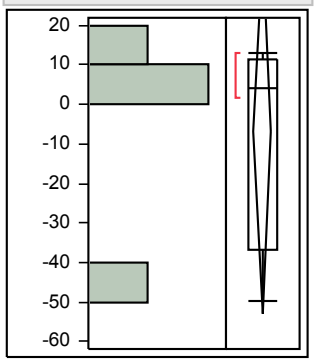
Summary Statistics

Mean	-6.266667
Std Dev	30.232819
Std Err Mean	17.454926
Upper 95% Mean	68.835819
Lower 95% Mean	-81.36915
N	3

XrM Distribution by Detection Method

Distributions Analyte_Detection=Thorium-230 Alpha Spectrometry

Bias



Quantiles

100.0%	maximum	13.2
99.5%		13.2
97.5%		13.2
90.0%		13.2
75.0%	quartile	11.55
50.0%	median	4.2
25.0%	quartile	-36.825
10.0%		-49.7
2.5%		-49.7
0.5%		-49.7
0.0%	minimum	-49.7

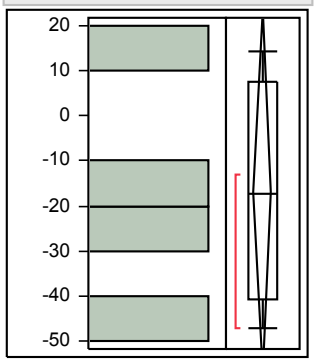
Summary Statistics

Mean	-7.025
Std Dev	28.831276
Std Err Mean	14.415638
Upper 95% Mean	38.851995
Lower 95% Mean	-52.90199
N	4

XrM Distribution by Detection Method

Distributions Analyte_Detection=Thorium-232 Alpha Spectrometry

Bias



Quantiles

100.0%	maximum	14.3
99.5%		14.3
97.5%		14.3
90.0%		14.3
75.0%	quartile	7.475
50.0%	median	-17.35
25.0%	quartile	-40.75
10.0%		-47.1
2.5%		-47.1
0.5%		-47.1
0.0%	minimum	-47.1

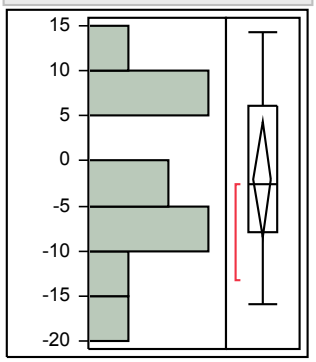
Summary Statistics

Mean	-16.875
Std Dev	25.322766
Std Err Mean	12.661383
Upper 95% Mean	23.419172
Lower 95% Mean	-57.16917
N	4

XrM Distribution by Detection Method

Distributions Analyte_Detection=Uranium-234/233 Alpha Spectrometry

Bias



Quantiles

100.0%	maximum	14.2
99.5%		14.2
97.5%		14.2
90.0%		12.94
75.0%	quartile	6.1
50.0%	median	-2.6
25.0%	quartile	-7.9
10.0%		-15.28
2.5%		-15.8
0.5%		-15.8
0.0%	minimum	-15.8

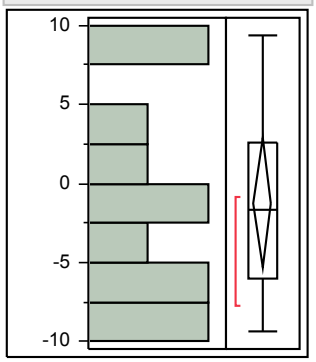
Summary Statistics

Mean	-2.054545
Std Dev	9.4180002
Std Err Mean	2.8396339
Upper 95% Mean	4.2725532
Lower 95% Mean	-8.381644
N	11

XrM Distribution by Detection Method

Distributions Analyte_Detection=Uranium-238 Alpha Spectrometry

Bias



Quantiles

100.0%	maximum	9.4
99.5%		9.4
97.5%		9.4
90.0%		9.06
75.0%	quartile	2.6
50.0%	median	-1.7
25.0%	quartile	-6
10.0%		-9.06
2.5%		-9.4
0.5%		-9.4
0.0%	minimum	-9.4

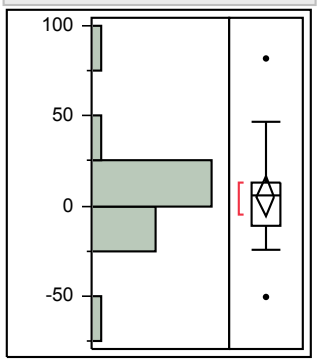
Summary Statistics

Mean	-1.245455
Std Dev	6.0998957
Std Err Mean	1.8391877
Upper 95% Mean	2.8525111
Lower 95% Mean	-5.34342
N	11

XrM Distribution by Detection Method

Distributions Analyte_Detection=Zinc-65 Gamma Spectrometry

Bias



Quantiles

100.0%	maximum	81.7
99.5%		81.7
97.5%		81.7
90.0%		37.3
75.0%	quartile	13
50.0%	median	6.1
25.0%	quartile	-11.2
10.0%		-24.3
2.5%		-50.4
0.5%		-50.4
0.0%	minimum	-50.4

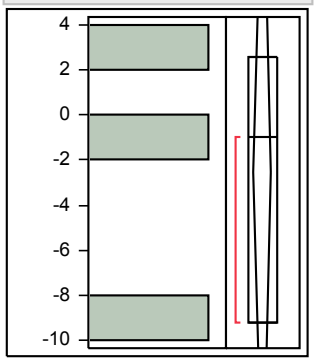
Summary Statistics

Mean	5.1826087
Std Dev	25.793281
Std Err Mean	5.3782708
Upper 95% Mean	16.33646
Lower 95% Mean	-5.971242
N	23

XrM Distribution by Prep Method

Distributions Analyte_Method=Americium-241 Acid dissolution by strong Aqua Reqia, hydrofluoric acid, etc.

Bias



Quantiles

100.0%	maximum	2.6
99.5%		2.6
97.5%		2.6
90.0%		2.6
75.0%	quartile	2.6
50.0%	median	-1
25.0%	quartile	-9.2
10.0%		-9.2
2.5%		-9.2
0.5%		-9.2
0.0%	minimum	-9.2

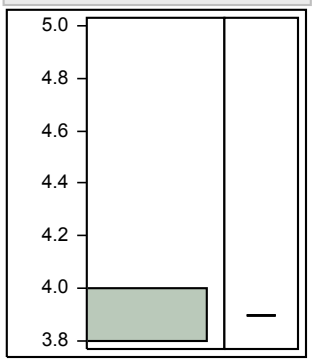
Summary Statistics

Mean	-2.533333
Std Dev	6.0475891
Std Err Mean	3.4915772
Upper 95% Mean	12.489711
Lower 95% Mean	-17.55638
N	3

XrM Distribution by Prep Method

Distributions Analyte_Method=Americium-241 Acid leaching without hydrofluoric acid

Bias



Quantiles

100.0%	maximum	3.9
99.5%		3.9
97.5%		3.9
90.0%		3.9
75.0%	quartile	3.9
50.0%	median	3.9
25.0%	quartile	3.9
10.0%		3.9
2.5%		3.9
0.5%		3.9
0.0%	minimum	3.9

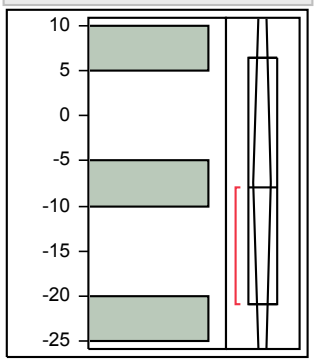
Summary Statistics

Mean	3.9
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1

XrM Distribution by Prep Method

Distributions Analyte_Method=Americium-241 Ion Exchange Chromatography / Ion Chromatography

Bias



Quantiles

100.0%	maximum	6.5
99.5%		6.5
97.5%		6.5
90.0%		6.5
75.0%	quartile	6.5
50.0%	median	-7.9
25.0%	quartile	-20.8
10.0%		-20.8
2.5%		-20.8
0.5%		-20.8
0.0%	minimum	-20.8

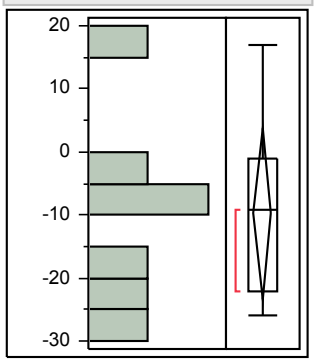
Summary Statistics

Mean	-7.4
Std Dev	13.656866
Std Err Mean	7.8847955
Upper 95% Mean	26.525537
Lower 95% Mean	-41.32554
N	3

XrM Distribution by Prep Method

Distributions Analyte_Method=Americium-241 No preparation - analyzed as received

Bias



Quantiles

100.0%	maximum	16.9
99.5%		16.9
97.5%		16.9
90.0%		16.9
75.0%	quartile	-1
50.0%	median	-9.1
25.0%	quartile	-22.1
10.0%		-26
2.5%		-26
0.5%		-26
0.0%	minimum	-26

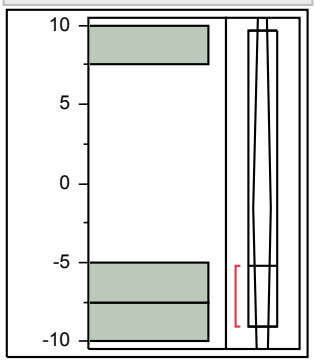
Summary Statistics

Mean	-9.8
Std Dev	14.580809
Std Err Mean	5.5110279
Upper 95% Mean	3.6849995
Lower 95% Mean	-23.285
N	7

XrM Distribution by Prep Method

Distributions Analyte_Method=Americium-241 Total dissolution by fusion

Bias



Quantiles

100.0%	maximum	9.7
99.5%		9.7
97.5%		9.7
90.0%		9.7
75.0%	quartile	9.7
50.0%	median	-5.2
25.0%	quartile	-9.1
10.0%		-9.1
2.5%		-9.1
0.5%		-9.1
0.0%	minimum	-9.1

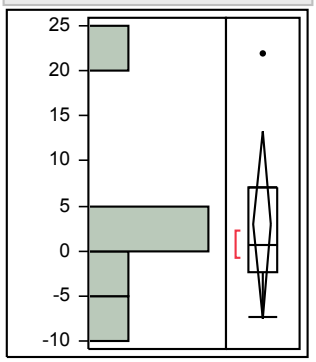
Summary Statistics

Mean	-1.533333
Std Dev	9.9218614
Std Err Mean	5.7283893
Upper 95% Mean	23.113937
Lower 95% Mean	-26.1806
N	3

XrM Distribution by Prep Method

Distributions Analyte_Method=Cesium-134 Acid dissolution by strong Aqua Reqia, hydrofluoric acid, etc.

Bias



Quantiles

100.0%	maximum	21.9
99.5%		21.9
97.5%		21.9
90.0%		21.9
75.0%	quartile	7.125
50.0%	median	0.7
25.0%	quartile	-2.35
10.0%		-7.3
2.5%		-7.3
0.5%		-7.3
0.0%	minimum	-7.3

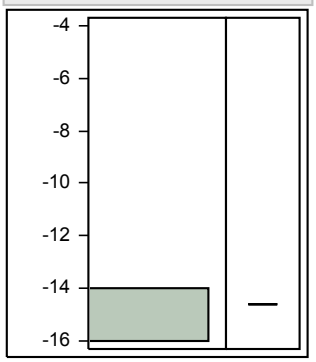
Summary Statistics

Mean	2.9166667
Std Dev	9.880975
Std Err Mean	4.0338911
Upper 95% Mean	13.286114
Lower 95% Mean	-7.452781
N	6

XrM Distribution by Prep Method

Distributions Analyte_Method=Cesium-134 Acid leaching without hydrofluoric acid

Bias



Quantiles

100.0%	maximum	-14.6
99.5%		-14.6
97.5%		-14.6
90.0%		-14.6
75.0%	quartile	-14.6
50.0%	median	-14.6
25.0%	quartile	-14.6
10.0%		-14.6
2.5%		-14.6
0.5%		-14.6
0.0%	minimum	-14.6

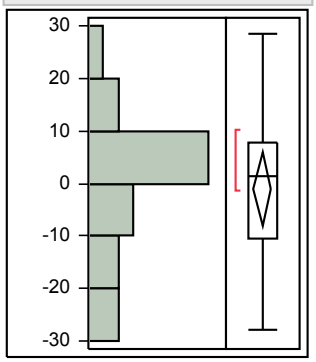
Summary Statistics

Mean	-14.6
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1

XrM Distribution by Prep Method

Distributions Analyte_Method=Cesium-134
No preparation - analyzed as received

Bias



Quantiles

100.0%	maximum	28.5
99.5%		28.5
97.5%		28.5
90.0%		14.64
75.0%	quartile	7.85
50.0%	median	1.3
25.0%	quartile	-10.6
10.0%		-26.71
2.5%		-27.7
0.5%		-27.7
0.0%	minimum	-27.7

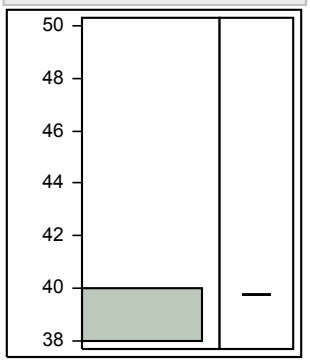
Summary Statistics

Mean	-1.1
Std Dev	14.21536
Std Err Mean	3.3505926
Upper 95% Mean	5.9691324
Lower 95% Mean	-8.169132
N	18

XrM Distribution by Prep Method

Distributions
Analyte_Method=Cesium-134 Other

Bias



Quantiles

100.0%	maximum	39.8
99.5%		39.8
97.5%		39.8
90.0%		39.8
75.0%	quartile	39.8
50.0%	median	39.8
25.0%	quartile	39.8
10.0%		39.8
2.5%		39.8
0.5%		39.8
0.0%	minimum	39.8

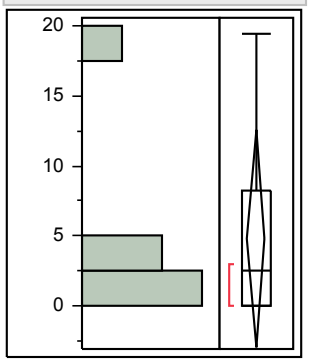
Summary Statistics

Mean	39.8
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1

XrM Distribution by Prep Method

Distributions Analyte_Method=Cesium-137 Acid dissolution by strong Aqua Reqia, hydrofluoric acid, etc.

Bias



Quantiles

100.0%	maximum	19.4
99.5%		19.4
97.5%		19.4
90.0%		19.4
75.0%	quartile	8.225
50.0%	median	2.5
25.0%	quartile	0
10.0%		0
2.5%		0
0.5%		0
0.0%	minimum	0

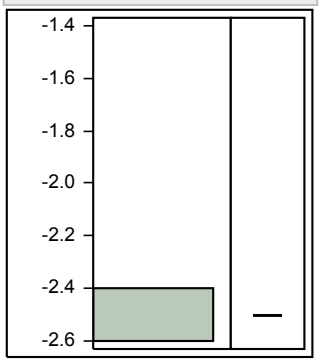
Summary Statistics

Mean	4.8166667
Std Dev	7.3540238
Std Err Mean	3.0022677
Upper 95% Mean	12.534241
Lower 95% Mean	-2.900908
N	6

XrM Distribution by Prep Method

Distributions Analyte_Method=Cesium-137 Acid leaching without hydrofluoric acid

Bias



Quantiles

100.0%	maximum	-2.5
99.5%		-2.5
97.5%		-2.5
90.0%		-2.5
75.0%	quartile	-2.5
50.0%	median	-2.5
25.0%	quartile	-2.5
10.0%		-2.5
2.5%		-2.5
0.5%		-2.5
0.0%	minimum	-2.5

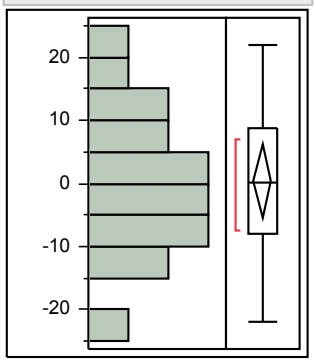
Summary Statistics

Mean	-2.5
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1

XrM Distribution by Prep Method

Distributions Analyte_Method=Cesium-137
No preparation - analyzed as received

Bias



Quantiles

100.0%	maximum	21.9
99.5%		21.9
97.5%		21.9
90.0%		17.4
75.0%	quartile	8.725
50.0%	median	0.15
25.0%	quartile	-7.875
10.0%		-13.89
2.5%		-21.9
0.5%		-21.9
0.0%	minimum	-21.9

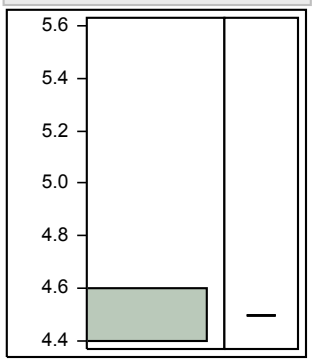
Summary Statistics

Mean	0.4055556
Std Dev	11.64926
Std Err Mean	2.7457569
Upper 95% Mean	6.1985963
Lower 95% Mean	-5.387485
N	18

XrM Distribution by Prep Method

Distributions
Analyte_Method=Cesium-137 Other

Bias



Quantiles

100.0%	maximum	4.5
99.5%		4.5
97.5%		4.5
90.0%		4.5
75.0%	quartile	4.5
50.0%	median	4.5
25.0%	quartile	4.5
10.0%		4.5
2.5%		4.5
0.5%		4.5
0.0%	minimum	4.5

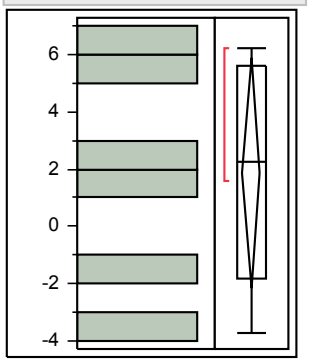
Summary Statistics

Mean	4.5
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1

XrM Distribution by Prep Method

Distributions Analyte_Method=Cobalt-57 Acid dissolution by strong Aqua Reqia, hydrofluoric acid, etc.

Bias



Quantiles

100.0%	maximum	6.2
99.5%		6.2
97.5%		6.2
90.0%		6.2
75.0%	quartile	5.6
50.0%	median	2.25
25.0%	quartile	-1.825
10.0%		-3.7
2.5%		-3.7
0.5%		-3.7
0.0%	minimum	-3.7

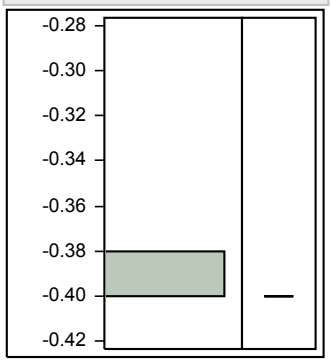
Summary Statistics

Mean	1.8666667
Std Dev	3.8155821
Std Err Mean	1.5577049
Upper 95% Mean	5.8708745
Lower 95% Mean	-2.137541
N	6

XrM Distribution by Prep Method

Distributions Analyte_Method=Cobalt-57 Acid leaching without hydrofluoric acid

Bias



Quantiles

100.0%	maximum	-0.4
99.5%		-0.4
97.5%		-0.4
90.0%		-0.4
75.0%	quartile	-0.4
50.0%	median	-0.4
25.0%	quartile	-0.4
10.0%		-0.4
2.5%		-0.4
0.5%		-0.4
0.0%	minimum	-0.4

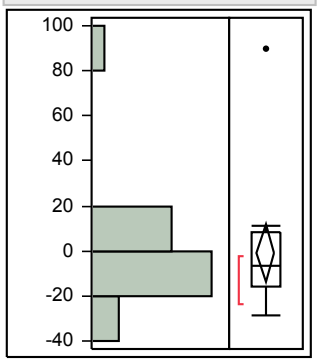
Summary Statistics

Mean	-0.4
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1

XrM Distribution by Prep Method

Distributions Analyte_Method=Cobalt-57
No preparation - analyzed as received

Bias



Quantiles

100.0%	maximum	89.7
99.5%		89.7
97.5%		89.7
90.0%		18.96
75.0%	quartile	8.425
50.0%	median	-6.4
25.0%	quartile	-15.4
10.0%		-23.99
2.5%		-28.4
0.5%		-28.4
0.0%	minimum	-28.4

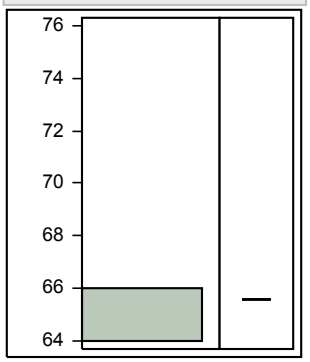
Summary Statistics

Mean	-0.577778
Std Dev	25.642395
Std Err Mean	6.0439704
Upper 95% Mean	12.173885
Lower 95% Mean	-13.32944
N	18

XrM Distribution by Prep Method

Distributions
Analyte_Method=Cobalt-57 Other

Bias



Quantiles

100.0%	maximum	65.6
99.5%		65.6
97.5%		65.6
90.0%		65.6
75.0%	quartile	65.6
50.0%	median	65.6
25.0%	quartile	65.6
10.0%		65.6
2.5%		65.6
0.5%		65.6
0.0%	minimum	65.6

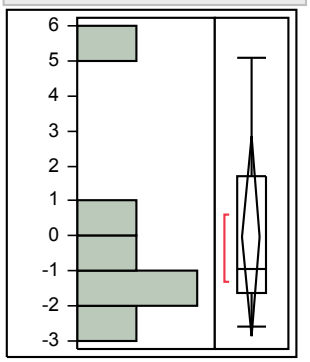
Summary Statistics

Mean	65.6
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1

XrM Distribution by Prep Method

Distributions Analyte_Method=Cobalt-60 Acid dissolution by strong Aqua Reqia, hydrofluoric acid, etc.

Bias



Quantiles

100.0%	maximum	5.1
99.5%		5.1
97.5%		5.1
90.0%		5.1
75.0%	quartile	1.725
50.0%	median	-0.95
25.0%	quartile	-1.625
10.0%		-2.6
2.5%		-2.6
0.5%		-2.6
0.0%	minimum	-2.6

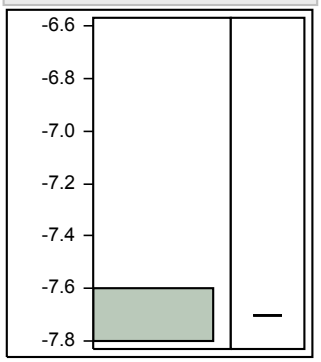
Summary Statistics

Mean	-0.016667
Std Dev	2.7154496
Std Err Mean	1.1085777
Upper 95% Mean	2.8330229
Lower 95% Mean	-2.866356
N	6

XrM Distribution by Prep Method

Distributions Analyte_Method=Cobalt-60 Acid leaching without hydrofluoric acid

Bias



Quantiles

100.0%	maximum	-7.7
99.5%		-7.7
97.5%		-7.7
90.0%		-7.7
75.0%	quartile	-7.7
50.0%	median	-7.7
25.0%	quartile	-7.7
10.0%		-7.7
2.5%		-7.7
0.5%		-7.7
0.0%	minimum	-7.7

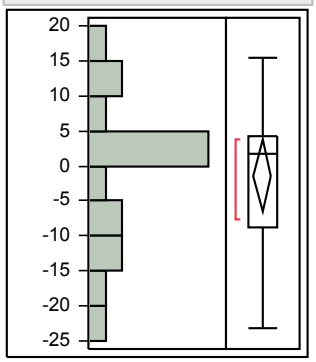
Summary Statistics

Mean	-7.7
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1

XrM Distribution by Prep Method

Distributions Analyte_Method=Cobalt-60
No preparation - analyzed as received

Bias



Quantiles

100.0%	maximum	15.4
99.5%		15.4
97.5%		15.4
90.0%		12.52
75.0%	quartile	4.125
50.0%	median	1.75
25.0%	quartile	-8.7
10.0%		-19.05
2.5%		-23.1
0.5%		-23.1
0.0%	minimum	-23.1

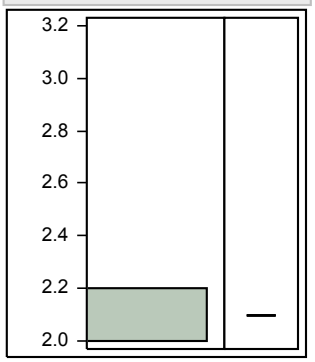
Summary Statistics

Mean	-1.377778
Std Dev	10.46077
Std Err Mean	2.4656272
Upper 95% Mean	3.8242408
Lower 95% Mean	-6.579796
N	18

XrM Distribution by Prep Method

Distributions
Analyte_Method=Cobalt-60 Other

Bias



Quantiles

100.0%	maximum	2.1
99.5%		2.1
97.5%		2.1
90.0%		2.1
75.0%	quartile	2.1
50.0%	median	2.1
25.0%	quartile	2.1
10.0%		2.1
2.5%		2.1
0.5%		2.1
0.0%	minimum	2.1

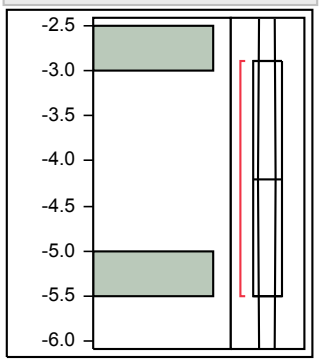
Summary Statistics

Mean	2.1
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1

XrM Distribution by Prep Method

Distributions Analyte_Method=Curium-244 Acid dissolution by strong Aqua Reqia, hydrofluoric acid, etc.

Bias



Quantiles

100.0%	maximum	-2.9
99.5%		-2.9
97.5%		-2.9
90.0%		-2.9
75.0%	quartile	-2.9
50.0%	median	-4.2
25.0%	quartile	-5.5
10.0%		-5.5
2.5%		-5.5
0.5%		-5.5
0.0%	minimum	-5.5

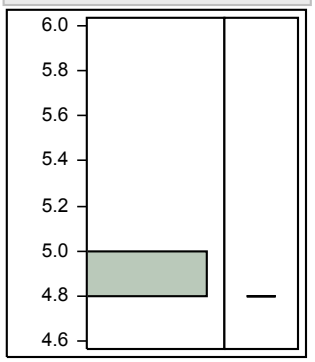
Summary Statistics

Mean	-4.2
Std Dev	1.8384776
Std Err Mean	1.3
Upper 95% Mean	12.318066
Lower 95% Mean	-20.71807
N	2

XrM Distribution by Prep Method

Distributions Analyte_Method=Curium-244 Acid leaching without hydrofluoric acid

Bias



Quantiles

100.0%	maximum	4.8
99.5%		4.8
97.5%		4.8
90.0%		4.8
75.0%	quartile	4.8
50.0%	median	4.8
25.0%	quartile	4.8
10.0%		4.8
2.5%		4.8
0.5%		4.8
0.0%	minimum	4.8

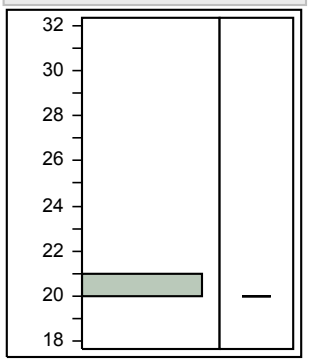
Summary Statistics

Mean	4.8
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1

XrM Distribution by Prep Method

Distributions Analyte_Method=Curium-244 Ion Exchange Chromatography / Ion Chromatography

Bias



Quantiles

100.0%	maximum	20
99.5%		20
97.5%		20
90.0%		20
75.0%	quartile	20
50.0%	median	20
25.0%	quartile	20
10.0%		20
2.5%		20
0.5%		20
0.0%	minimum	20

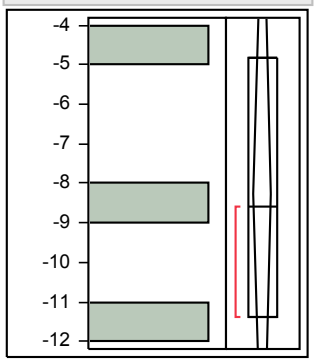
Summary Statistics

Mean	20
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1

XrM Distribution by Prep Method

Distributions Analyte_Method=Curium-244 Total dissolution by fusion

Bias



Quantiles

100.0%	maximum	-4.8
99.5%		-4.8
97.5%		-4.8
90.0%		-4.8
75.0%	quartile	-4.8
50.0%	median	-8.6
25.0%	quartile	-11.4
10.0%		-11.4
2.5%		-11.4
0.5%		-11.4
0.0%	minimum	-11.4

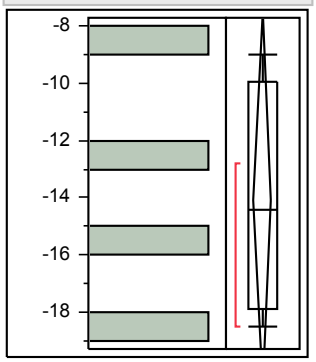
Summary Statistics

Mean	-8.266667
Std Dev	3.3126022
Std Err Mean	1.9125318
Upper 95% Mean	-0.037707
Lower 95% Mean	-16.49563
N	3

XrM Distribution by Prep Method

Distributions Analyte_Method=Iridium-192 Acid dissolution by strong Aqua Reqia, hydrofluoric acid, etc.

Bias



Quantiles

100.0%	maximum	-9
99.5%		-9
97.5%		-9
90.0%		-9
75.0%	quartile	-9.95
50.0%	median	-14.4
25.0%	quartile	-17.875
10.0%		-18.5
2.5%		-18.5
0.5%		-18.5
0.0%	minimum	-18.5

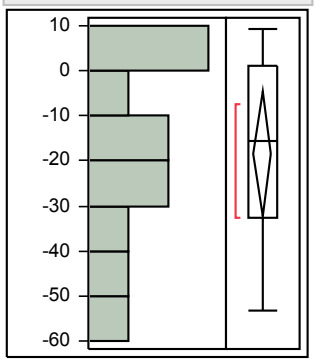
Summary Statistics

Mean	-14.075
Std Dev	4.1096431
Std Err Mean	2.0548216
Upper 95% Mean	-7.535641
Lower 95% Mean	-20.61436
N	4

XrM Distribution by Prep Method

Distributions Analyte_Method=Iridium-192 No preparation - analyzed as received

Bias



Quantiles

100.0%	maximum	9.2
99.5%		9.2
97.5%		9.2
90.0%		8.88
75.0%	quartile	1.1
50.0%	median	-15.5
25.0%	quartile	-32.6
10.0%		-50.8
2.5%		-53.2
0.5%		-53.2
0.0%	minimum	-53.2

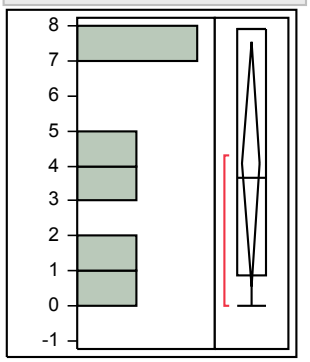
Summary Statistics

Mean	-18.40909
Std Dev	20.448836
Std Err Mean	6.1655562
Upper 95% Mean	-4.671376
Lower 95% Mean	-32.14681
N	11

XrM Distribution by Prep Method

Distributions Analyte_Method=Manganese-54 Acid dissolution by strong Aqua Reqia, hydrofluoric acid, etc.

Bias



Quantiles

100.0%	maximum	7.9
99.5%		7.9
97.5%		7.9
90.0%		7.9
75.0%	quartile	7.9
50.0%	median	3.65
25.0%	quartile	0.9
10.0%		0
2.5%		0
0.5%		0
0.0%	minimum	0

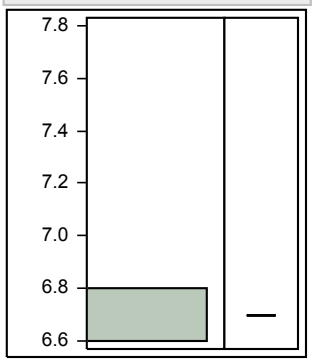
Summary Statistics

Mean	4.05
Std Dev	3.3267101
Std Err Mean	1.3581237
Upper 95% Mean	7.5411681
Lower 95% Mean	0.5588319
N	6

XrM Distribution by Prep Method

Distributions Analyte_Method=Manganese-54 Acid leaching without hydrofluoric acid

Bias



Quantiles

100.0%	maximum	6.7
99.5%		6.7
97.5%		6.7
90.0%		6.7
75.0%	quartile	6.7
50.0%	median	6.7
25.0%	quartile	6.7
10.0%		6.7
2.5%		6.7
0.5%		6.7
0.0%	minimum	6.7

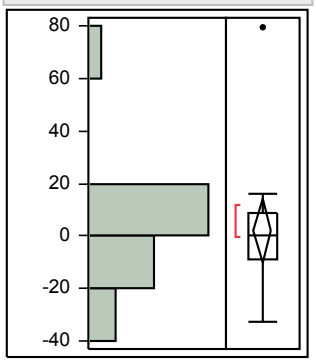
Summary Statistics

Mean	6.7
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1

XrM Distribution by Prep Method

Distributions Analyte_Method=Manganese-54 No preparation - analyzed as received

Bias



Quantiles

100.0%	maximum	79.3
99.5%		79.3
97.5%		79.3
90.0%		28.58
75.0%	quartile	9
50.0%	median	0.4
25.0%	quartile	-9.15
10.0%		-27.9
2.5%		-32.3
0.5%		-32.3
0.0%	minimum	-32.3

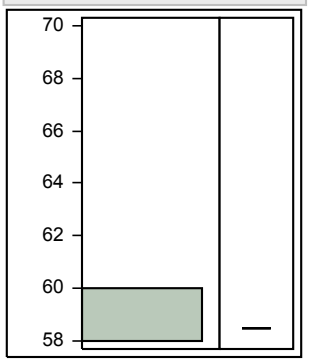
Summary Statistics

Mean	2.1529412
Std Dev	23.748635
Std Err Mean	5.7598899
Upper 95% Mean	14.363362
Lower 95% Mean	-10.05748
N	17

XrM Distribution by Prep Method

Distributions
Analyte_Method=Manganese-54 Other

Bias



Quantiles

100.0%	maximum	58.5
99.5%		58.5
97.5%		58.5
90.0%		58.5
75.0%	quartile	58.5
50.0%	median	58.5
25.0%	quartile	58.5
10.0%		58.5
2.5%		58.5
0.5%		58.5
0.0%	minimum	58.5

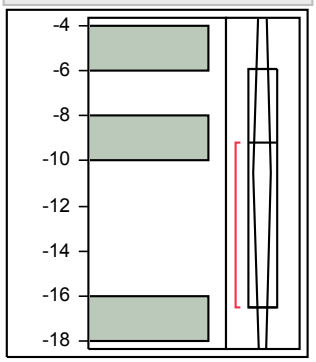
Summary Statistics

Mean	58.5
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1

XrM Distribution by Prep Method

Distributions Analyte_Method=Plutonium-238 Acid dissolution by strong Aqua Reqia, hydrofluoric acid, etc.

Bias



Quantiles

100.0%	maximum	-5.9
99.5%		-5.9
97.5%		-5.9
90.0%		-5.9
75.0%	quartile	-5.9
50.0%	median	-9.2
25.0%	quartile	-16.5
10.0%		-16.5
2.5%		-16.5
0.5%		-16.5
0.0%	minimum	-16.5

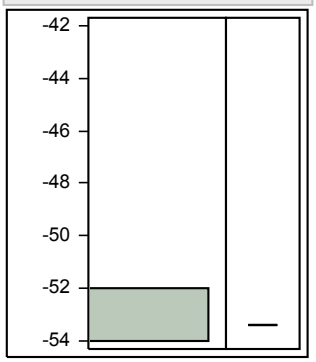
Summary Statistics

Mean	-10.53333
Std Dev	5.4243279
Std Err Mean	3.1317372
Upper 95% Mean	2.9414442
Lower 95% Mean	-24.00811
N	3

XrM Distribution by Prep Method

Distributions Analyte_Method=Plutonium-238 Acid leaching without hydrofluoric acid

Bias



Quantiles

100.0%	maximum	-53.4
99.5%		-53.4
97.5%		-53.4
90.0%		-53.4
75.0%	quartile	-53.4
50.0%	median	-53.4
25.0%	quartile	-53.4
10.0%		-53.4
2.5%		-53.4
0.5%		-53.4
0.0%	minimum	-53.4

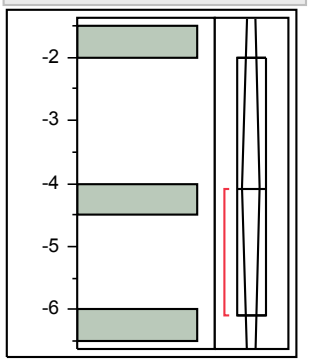
Summary Statistics

Mean	-53.4
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1

XrM Distribution by Prep Method

Distributions Analyte_Method=Plutonium-238 Ion Exchange Chromatography / Ion Chromatography

Bias



Quantiles

100.0%	maximum	-2
99.5%		-2
97.5%		-2
90.0%		-2
75.0%	quartile	-2
50.0%	median	-4.1
25.0%	quartile	-6.1
10.0%		-6.1
2.5%		-6.1
0.5%		-6.1
0.0%	minimum	-6.1

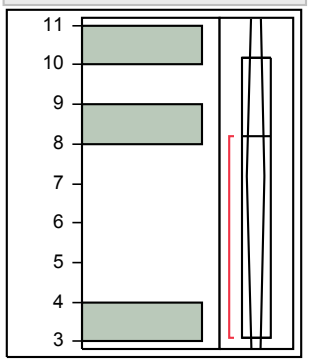
Summary Statistics

Mean	-4.066667
Std Dev	2.0502032
Std Err Mean	1.1836854
Upper 95% Mean	1.0263205
Lower 95% Mean	-9.159654
N	3

XrM Distribution by Prep Method

Distributions Analyte_Method=Plutonium-238 Total dissolution by fusion

Bias



Quantiles

100.0%	maximum	10.2
99.5%		10.2
97.5%		10.2
90.0%		10.2
75.0%	quartile	10.2
50.0%	median	8.2
25.0%	quartile	3.1
10.0%		3.1
2.5%		3.1
0.5%		3.1
0.0%	minimum	3.1

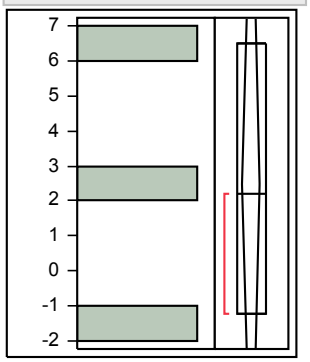
Summary Statistics

Mean	7.1666667
Std Dev	3.6610563
Std Err Mean	2.1137118
Upper 95% Mean	16.261235
Lower 95% Mean	-1.927901
N	3

XrM Distribution by Prep Method

Distributions Analyte_Method=Plutonium-239/240 Acid dissolution by strong Aqua Reqia, hydrofluoric acid, etc.

Bias



Quantiles

100.0%	maximum	6.5
99.5%		6.5
97.5%		6.5
90.0%		6.5
75.0%	quartile	6.5
50.0%	median	2.2
25.0%	quartile	-1.2
10.0%		-1.2
2.5%		-1.2
0.5%		-1.2
0.0%	minimum	-1.2

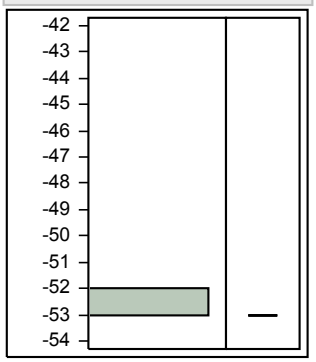
Summary Statistics

Mean	2.5
Std Dev	3.8587563
Std Err Mean	2.227854
Upper 95% Mean	12.085682
Lower 95% Mean	-7.085682
N	3

XrM Distribution by Prep Method

Distributions Analyte_Method=Plutonium-239/240 Acid leaching without hydrofluoric acid

Bias



Quantiles

100.0%	maximum	-53
99.5%		-53
97.5%		-53
90.0%		-53
75.0%	quartile	-53
50.0%	median	-53
25.0%	quartile	-53
10.0%		-53
2.5%		-53
0.5%		-53
0.0%	minimum	-53

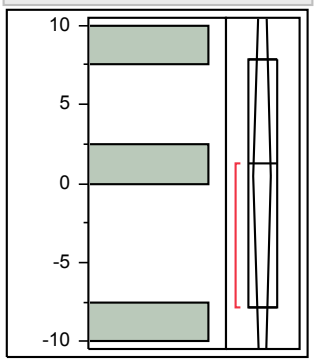
Summary Statistics

Mean	-53
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1

XrM Distribution by Prep Method

Distributions Analyte_Method=Plutonium-239/240
Ion Exchange Chromatography / Ion Chromatography

Bias



Quantiles

100.0%	maximum	7.8
99.5%		7.8
97.5%		7.8
90.0%		7.8
75.0%	quartile	7.8
50.0%	median	1.3
25.0%	quartile	-7.8
10.0%		-7.8
2.5%		-7.8
0.5%		-7.8
0.0%	minimum	-7.8

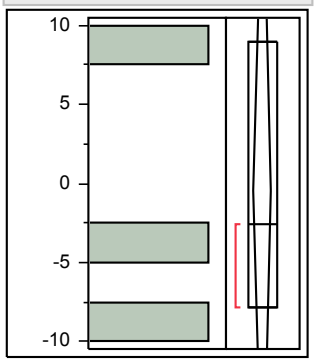
Summary Statistics

Mean	0.4333333
Std Dev	7.8360279
Std Err Mean	4.5241328
Upper 95% Mean	19.899106
Lower 95% Mean	-19.03244
N	3

XrM Distribution by Prep Method

Distributions Analyte_Method=Plutonium-239/240 Total dissolution by fusion

Bias



Quantiles

100.0%	maximum	9
99.5%		9
97.5%		9
90.0%		9
75.0%	quartile	9
50.0%	median	-2.6
25.0%	quartile	-7.8
10.0%		-7.8
2.5%		-7.8
0.5%		-7.8
0.0%	minimum	-7.8

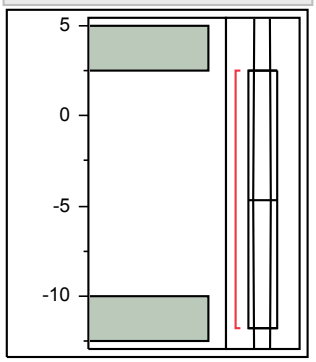
Summary Statistics

Mean	-0.466667
Std Dev	8.6007752
Std Err Mean	4.9656599
Upper 95% Mean	20.898843
Lower 95% Mean	-21.83218
N	3

XrM Distribution by Prep Method

Distributions Analyte_Method=Strontium-90 Acid dissolution by strong Aqua Reqia, hydrofluoric acid, etc.

Bias



Quantiles

100.0%	maximum	2.5
99.5%		2.5
97.5%		2.5
90.0%		2.5
75.0%	quartile	2.5
50.0%	median	-4.65
25.0%	quartile	-11.8
10.0%		-11.8
2.5%		-11.8
0.5%		-11.8
0.0%	minimum	-11.8

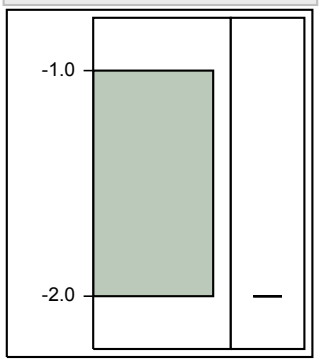
Summary Statistics

Mean	-4.65
Std Dev	10.111627
Std Err Mean	7.15
Upper 95% Mean	86.199364
Lower 95% Mean	-95.49936
N	2

XrM Distribution by Prep Method

Distributions Analyte_Method=Strontium-90 Coprecipitation, acidified

Bias



Quantiles

100.0%	maximum	-2
99.5%		-2
97.5%		-2
90.0%		-2
75.0%	quartile	-2
50.0%	median	-2
25.0%	quartile	-2
10.0%		-2
2.5%		-2
0.5%		-2
0.0%	minimum	-2

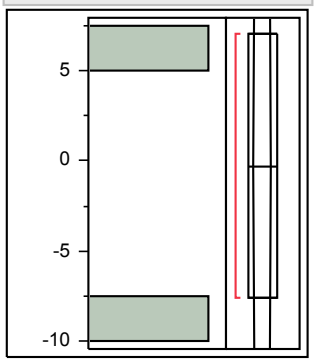
Summary Statistics

Mean	-2
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1

XrM Distribution by Prep Method

Distributions Analyte_Method=Strontium-90 EPA 905, Radioactive Strontium, 600/4-80-032

Bias



Quantiles

100.0%	maximum	7
99.5%		7
97.5%		7
90.0%		7
75.0%	quartile	7
50.0%	median	-0.3
25.0%	quartile	-7.6
10.0%		-7.6
2.5%		-7.6
0.5%		-7.6
0.0%	minimum	-7.6

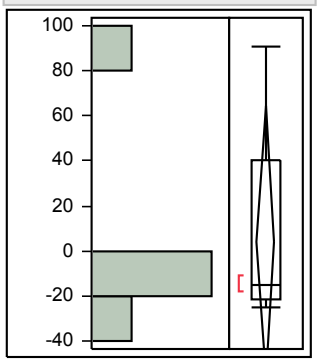
Summary Statistics

Mean	-0.3
Std Dev	10.323759
Std Err Mean	7.3
Upper 95% Mean	92.455295
Lower 95% Mean	-93.05529
N	2

XrM Distribution by Prep Method

Distributions Analyte_Method=Strontium-90 Ion Exchange Chromatography / Ion Chromatography

Bias



Quantiles

100.0%	maximum	90.8
99.5%		90.8
97.5%		90.8
90.0%		90.8
75.0%	quartile	39.95
50.0%	median	-15
25.0%	quartile	-21.45
10.0%		-25.3
2.5%		-25.3
0.5%		-25.3
0.0%	minimum	-25.3

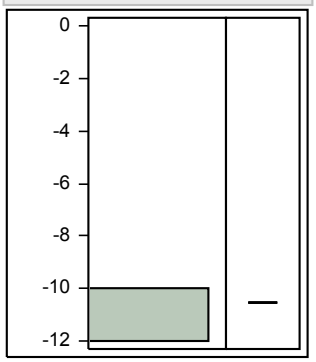
Summary Statistics

Mean	4.4
Std Dev	48.583691
Std Err Mean	21.727287
Upper 95% Mean	64.72462
Lower 95% Mean	-55.92462
N	5

XrM Distribution by Prep Method

Distributions Analyte_Method=Strontium-90 Total dissolution by fusion

Bias



Quantiles

100.0%	maximum	-10.5
99.5%		-10.5
97.5%		-10.5
90.0%		-10.5
75.0%	quartile	-10.5
50.0%	median	-10.5
25.0%	quartile	-10.5
10.0%		-10.5
2.5%		-10.5
0.5%		-10.5
0.0%	minimum	-10.5

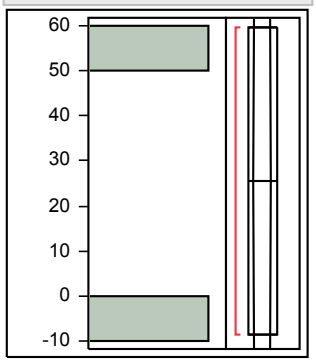
Summary Statistics

Mean	-10.5
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1

XrM Distribution by Prep Method

Distributions Analyte_Method=Technetium-99 Ion Exchange Chromatography / Ion Chromatography

Bias



Quantiles

100.0%	maximum	59.5
99.5%		59.5
97.5%		59.5
90.0%		59.5
75.0%	quartile	59.5
50.0%	median	25.45
25.0%	quartile	-8.6
10.0%		-8.6
2.5%		-8.6
0.5%		-8.6
0.0%	minimum	-8.6

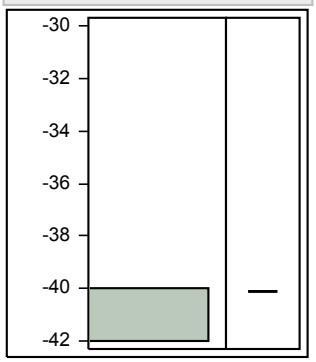
Summary Statistics

Mean	25.45
Std Dev	48.153972
Std Err Mean	34.05
Upper 95% Mean	458.09627
Lower 95% Mean	-407.1963
N	2

XrM Distribution by Prep Method

Distributions Analyte_Method=Thorium-228 Acid dissolution by strong Aqua Reqia, hydrofluoric acid, etc.

Bias



Quantiles

100.0%	maximum	-40.1
99.5%		-40.1
97.5%		-40.1
90.0%		-40.1
75.0%	quartile	-40.1
50.0%	median	-40.1
25.0%	quartile	-40.1
10.0%		-40.1
2.5%		-40.1
0.5%		-40.1
0.0%	minimum	-40.1

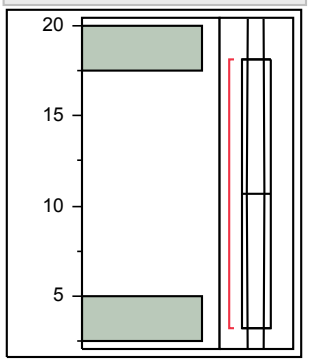
Summary Statistics

Mean	-40.1
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1

XrM Distribution by Prep Method

Distributions Analyte_Method=Thorium-228 Total dissolution by fusion

Bias



Quantiles

100.0%	maximum	18.1
99.5%		18.1
97.5%		18.1
90.0%		18.1
75.0%	quartile	18.1
50.0%	median	10.65
25.0%	quartile	3.2
10.0%		3.2
2.5%		3.2
0.5%		3.2
0.0%	minimum	3.2

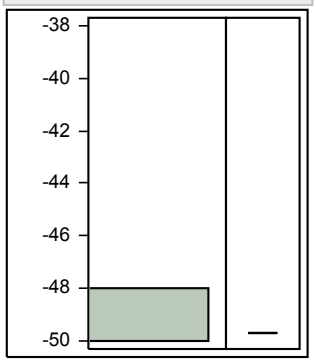
Summary Statistics

Mean	10.65
Std Dev	10.535891
Std Err Mean	7.45
Upper 95% Mean	105.31123
Lower 95% Mean	-84.01123
N	2

XrM Distribution by Prep Method

Distributions Analyte_Method=Thorium-230 Acid dissolution by strong Aqua Reqia, hydrofluoric acid, etc.

Bias



Quantiles

100.0%	maximum	-49.7
99.5%		-49.7
97.5%		-49.7
90.0%		-49.7
75.0%	quartile	-49.7
50.0%	median	-49.7
25.0%	quartile	-49.7
10.0%		-49.7
2.5%		-49.7
0.5%		-49.7
0.0%	minimum	-49.7

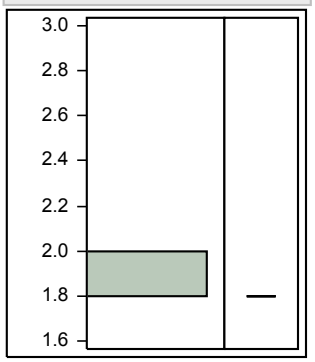
Summary Statistics

Mean	-49.7
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1

XrM Distribution by Prep Method

Distributions Analyte_Method=Thorium-230 Ion Exchange Chromatography / Ion Chromatography

Bias



Quantiles

100.0%	maximum	1.8
99.5%		1.8
97.5%		1.8
90.0%		1.8
75.0%	quartile	1.8
50.0%	median	1.8
25.0%	quartile	1.8
10.0%		1.8
2.5%		1.8
0.5%		1.8
0.0%	minimum	1.8

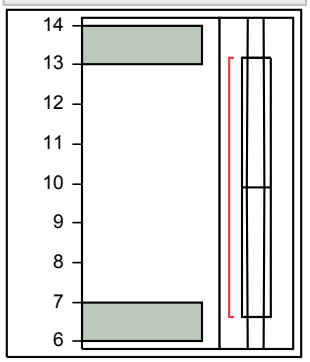
Summary Statistics

Mean	1.8
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1

XrM Distribution by Prep Method

Distributions Analyte_Method=Thorium-230 Total dissolution by fusion

Bias



Quantiles

100.0%	maximum	13.2
99.5%		13.2
97.5%		13.2
90.0%		13.2
75.0%	quartile	13.2
50.0%	median	9.9
25.0%	quartile	6.6
10.0%		6.6
2.5%		6.6
0.5%		6.6
0.0%	minimum	6.6

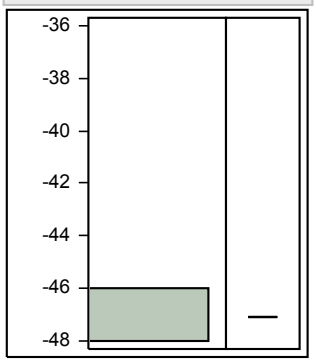
Summary Statistics

Mean	9.9
Std Dev	4.6669048
Std Err Mean	3.3
Upper 95% Mean	51.830476
Lower 95% Mean	-32.03048
N	2

XrM Distribution by Prep Method

Distributions Analyte_Method=Thorium-232 Acid dissolution by strong Aqua Reqia, hydrofluoric acid, etc.

Bias



Quantiles

100.0%	maximum	-47.1
99.5%		-47.1
97.5%		-47.1
90.0%		-47.1
75.0%	quartile	-47.1
50.0%	median	-47.1
25.0%	quartile	-47.1
10.0%		-47.1
2.5%		-47.1
0.5%		-47.1
0.0%	minimum	-47.1

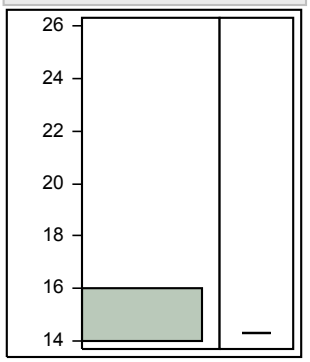
Summary Statistics

Mean	-47.1
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1

XrM Distribution by Prep Method

Distributions Analyte_Method=Thorium-232 Ion Exchange Chromatography / Ion Chromatography

Bias



Quantiles

100.0%	maximum	14.3
99.5%		14.3
97.5%		14.3
90.0%		14.3
75.0%	quartile	14.3
50.0%	median	14.3
25.0%	quartile	14.3
10.0%		14.3
2.5%		14.3
0.5%		14.3
0.0%	minimum	14.3

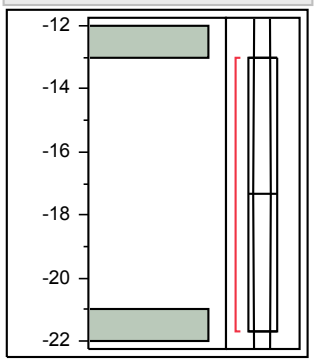
Summary Statistics

Mean	14.3
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1

XrM Distribution by Prep Method

Distributions Analyte_Method=Thorium-232 Total dissolution by fusion

Bias



Quantiles

100.0%	maximum	-13
99.5%		-13
97.5%		-13
90.0%		-13
75.0%	quartile	-13
50.0%	median	-17.35
25.0%	quartile	-21.7
10.0%		-21.7
2.5%		-21.7
0.5%		-21.7
0.0%	minimum	-21.7

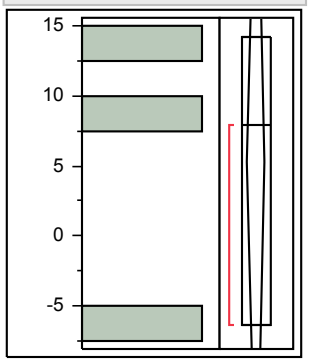
Summary Statistics

Mean	-17.35
Std Dev	6.151829
Std Err Mean	4.35
Upper 95% Mean	37.921991
Lower 95% Mean	-72.62199
N	2

XrM Distribution by Prep Method

Distributions Analyte_Method=Uranium-234/233 Acid dissolution by strong Aqua Reqia, hydrofluoric acid, etc.

Bias



Quantiles

100.0%	maximum	14.2
99.5%		14.2
97.5%		14.2
90.0%		14.2
75.0%	quartile	14.2
50.0%	median	7.9
25.0%	quartile	-6.3
10.0%		-6.3
2.5%		-6.3
0.5%		-6.3
0.0%	minimum	-6.3

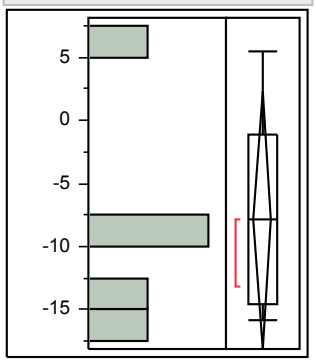
Summary Statistics

Mean	5.2666667
Std Dev	10.500635
Std Err Mean	6.0625444
Upper 95% Mean	31.35169
Lower 95% Mean	-20.81836
N	3

XrM Distribution by Prep Method

Distributions Analyte_Method=Uranium-234/233
Ion Exchange Chromatography / Ion Chromatography

Bias



Quantiles

100.0%	maximum	5.5
99.5%		5.5
97.5%		5.5
90.0%		5.5
75.0%	quartile	-1.2
50.0%	median	-7.9
25.0%	quartile	-14.5
10.0%		-15.8
2.5%		-15.8
0.5%		-15.8
0.0%	minimum	-15.8

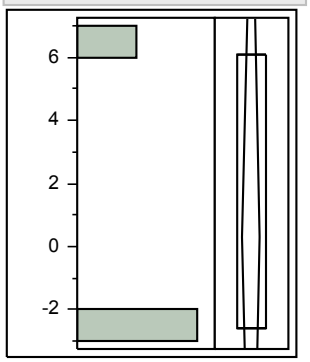
Summary Statistics

Mean	-7.86
Std Dev	8.2166295
Std Err Mean	3.6745884
Upper 95% Mean	2.342293
Lower 95% Mean	-18.06229
N	5

XrM Distribution by Prep Method

Distributions Analyte_Method=Uranium-234/233 Total dissolution by fusion

Bias



Quantiles

100.0%	maximum	6.1
99.5%		6.1
97.5%		6.1
90.0%		6.1
75.0%	quartile	6.1
50.0%	median	-2.6
25.0%	quartile	-2.6
10.0%		-2.6
2.5%		-2.6
0.5%		-2.6
0.0%	minimum	-2.6

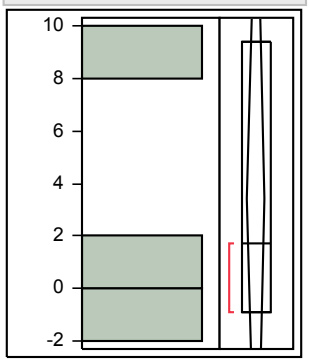
Summary Statistics

Mean	0.3
Std Dev	5.0229473
Std Err Mean	2.9
Upper 95% Mean	12.777693
Lower 95% Mean	-12.17769
N	3

XrM Distribution by Prep Method

Distributions Analyte_Method=Uranium-238 Acid dissolution by strong Aqua Reqia, hydrofluoric acid, etc.

Bias



Quantiles

100.0%	maximum	9.4
99.5%		9.4
97.5%		9.4
90.0%		9.4
75.0%	quartile	9.4
50.0%	median	1.7
25.0%	quartile	-0.9
10.0%		-0.9
2.5%		-0.9
0.5%		-0.9
0.0%	minimum	-0.9

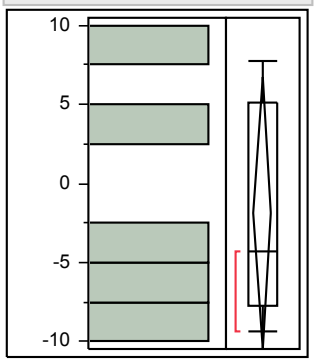
Summary Statistics

Mean	3.4
Std Dev	5.3563047
Std Err Mean	3.092464
Upper 95% Mean	16.705798
Lower 95% Mean	-9.905798
N	3

XrM Distribution by Prep Method

Distributions Analyte_Method=Uranium-238 Ion Exchange Chromatography / Ion Chromatography

Bias



Quantiles

100.0%	maximum	7.7
99.5%		7.7
97.5%		7.7
90.0%		7.7
75.0%	quartile	5.15
50.0%	median	-4.3
25.0%	quartile	-7.7
10.0%		-9.4
2.5%		-9.4
0.5%		-9.4
0.0%	minimum	-9.4

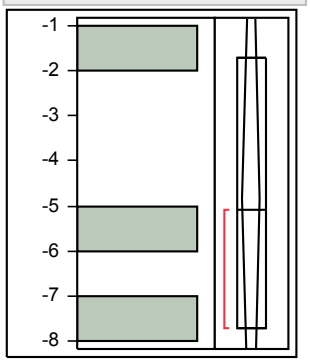
Summary Statistics

Mean	-1.88
Std Dev	6.9142606
Std Err Mean	3.0921514
Upper 95% Mean	6.7051885
Lower 95% Mean	-10.46519
N	5

XrM Distribution by Prep Method

Distributions Analyte_Method=Uranium-238 Total dissolution by fusion

Bias



Quantiles

100.0%	maximum	-1.7
99.5%		-1.7
97.5%		-1.7
90.0%		-1.7
75.0%	quartile	-1.7
50.0%	median	-5.1
25.0%	quartile	-7.7
10.0%		-7.7
2.5%		-7.7
0.5%		-7.7
0.0%	minimum	-7.7

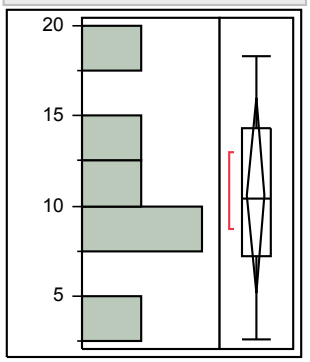
Summary Statistics

Mean	-4.833333
Std Dev	3.0088758
Std Err Mean	1.7371752
Upper 95% Mean	2.6411284
Lower 95% Mean	-12.3078
N	3

XrM Distribution by Prep Method

Distributions Analyte_Method=Zinc-65 Acid dissolution by strong Aqua Reqia, hydrofluoric acid, etc.

Bias



Quantiles

100.0%	maximum	18.3
99.5%		18.3
97.5%		18.3
90.0%		18.3
75.0%	quartile	14.325
50.0%	median	10.45
25.0%	quartile	7.175
10.0%		2.6
2.5%		2.6
0.5%		2.6
0.0%	minimum	2.6

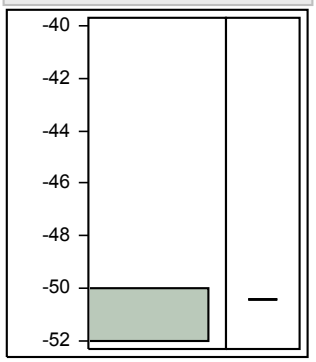
Summary Statistics

Mean	10.583333
Std Dev	5.1797362
Std Err Mean	2.1146184
Upper 95% Mean	16.019133
Lower 95% Mean	5.1475336
N	6

XrM Distribution by Prep Method

Distributions Analyte_Method=Zinc-65 Acid leaching without hydrofluoric acid

Bias



Quantiles

100.0%	maximum	-50.4
99.5%		-50.4
97.5%		-50.4
90.0%		-50.4
75.0%	quartile	-50.4
50.0%	median	-50.4
25.0%	quartile	-50.4
10.0%		-50.4
2.5%		-50.4
0.5%		-50.4
0.0%	minimum	-50.4

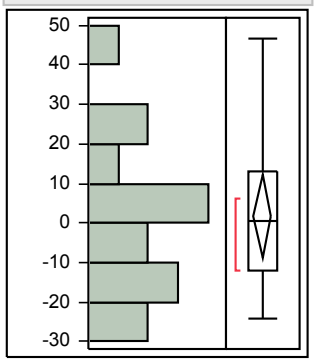
Summary Statistics

Mean	-50.4
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1

XrM Distribution by Prep Method

Distributions Analyte_Method=Zinc-65
No preparation - analyzed as received

Bias



Quantiles

100.0%	maximum	46.5
99.5%		46.5
97.5%		46.5
90.0%		32.7
75.0%	quartile	13
50.0%	median	0.3
25.0%	quartile	-12.2
10.0%		-24.3
2.5%		-24.3
0.5%		-24.3
0.0%	minimum	-24.3

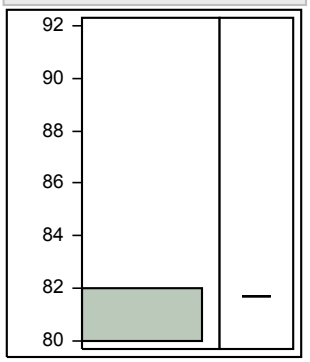
Summary Statistics

Mean	1.6266667
Std Dev	19.260043
Std Err Mean	4.9729216
Upper 95% Mean	12.292523
Lower 95% Mean	-9.039189
N	15

XrM Distribution by Prep Method

Distributions
Analyte_Method=Zinc-65 Other

Bias



Quantiles

100.0%	maximum	81.7
99.5%		81.7
97.5%		81.7
90.0%		81.7
75.0%	quartile	81.7
50.0%	median	81.7
25.0%	quartile	81.7
10.0%		81.7
2.5%		81.7
0.5%		81.7
0.0%	minimum	81.7

Summary Statistics

Mean	81.7
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1