RESL CUSTOMER EXPORT CONTROL AGREEMENT

It is the Radiological and Environmental Sciences Laboratory's (RESL) policy to conduct business in accordance with all applicable U.S. export control laws and regulations. It is also RESL's policy that its Customers comply with U.S. export control laws and regulations. Therefore, Customer agrees to the following:

1. Because products, technical data, and technical assistance (i.e., services) provided to Customer by RESL may be subject to U.S. export control laws and regulations, (i) transactions with certain persons and companies and (ii) the export or reexport of certain types and levels of products, technical data, and services are prohibited or restricted.

2. Customer acknowledges that it is responsible for its own compliance with U.S. export control laws and regulations. Customer further agrees that it assumes the responsibility to obtain all necessary U.S. export licenses or other U.S. governmental authorizations, as well as all liability for the failure to do so.

3. Customer acknowledges that export control requirements may change and that the export or reexport of RESL products, technical data, and services without an export license or other appropriate governmental authorization may result in criminal and/or civil liability.

4. The obligations and requirements described herein shall survive the expiration or termination of any agreement or contract between RESL and Customer.

MaS50 Participating Laboratories

Lab Code	Lab Name	Matrix Code
ADEM01	Alabama Department of Environmental Management	MaS
ADFC99	Abu Dhabi Quality and Conformity Council-Central Testing Lab	MaS
AFOH01	USAFSAM/OEA	MaS
AMEC99	Jacobs Clean Energy Limited - Analytical Services	MaS
ARGO01	Idaho National Laboratory	MaS
ARPL01	Analytical Support Operations - Radiochemical Processing Lab	MaS
ARSL01	ARS	MaS
ASUK99	AWE (Aldermaston)	MaS
AY1201	Consolidated Nuclear Security, LLC, ACO Laboratory	MaS
BY1201	Consolidated Nuclear Security, LLC, ACO, Production Laboratory	MaS
CESL01	Lawrence Livermore National Laboratory - EMRL	MaS
CMRC01	Carlsbad Environmental Monitoring and Research Center	MaS
COPS99	Health Canada Radiation Protection Bureau	MaS
EFGS01	Eurofins Frontier Global Sciences, LLC.	MaS
ERCL01	Washington State Public Health Laboratories	MaS
ERHD99	National Monitoring Section, Radiation Protection Bureau, Health Canada	MaS
ETTP01	MCLinc	MaS
FDHE01	Florida Dept of Health Environmental Laboratory	MaS
FDOH01	Florida Dept. of Health, Mobile Environmental Radiological Lab	MaS
GENE01	GEL Laboratories, LLC	MaS
GPCL01	Georgia Power Company Environmental Laboratory	MaS
HECR01	SC Dept. Health and Environmental Control Radiological Laboratory	MaS
HPAC99	UKHSA, RCE Glasgow	MaS
HPAL01	Los Alamos National Laboratory	MaS
IAEA20	IAEA Marine Environment Laboratories, Radiometrics Laboratory	MaS
IAEA99	International Atomic Energy Agency	MaS
IEMA01	Illinois Emergency Management Agency Radiochemistry Laboratory	MaS
ISUE01	ISU Environmental Monitoring Laboratory	MaS
JLNN01	Jefferson Laboratory	MaS
JNRC99	Energy and Mineral Regulatory Commission	MaS
LOCK03	Advanced Test Reactor (ATR) Complex Radioanalytical Laboratory	MaS
MART01	Fluor-BWXT Portsmouth LLC, Analytical Laboratory	MaS
MART03	Radioactive Material Analysis Laboratory	MaS
MDPH01	MDPH-Radiation Control Program	MaS
NARL01	National Analytical Radiation Environmental Laboratory	MaS
NESI01	BWXT-Radioisotope & Analytical Chemistry Laboratory	MaS
NJDH01	New Jersey Dept. of Health, ECLS	MaS
NOCS99	National Oceanography Centre, Southampton	MaS
ODHL01	Ohio Department of Health Laboratory	MaS
OTLI01	Pace Analytical National Center for Testing & Innovation	MaS
RJLG01	RJ Lee Group - Columbia Basin Analytical Laboratories (CBAL)	MaS
SANC99	RadioAnalysis, South Africa Nuclear Energy Corp.	MaS
SEML01	SRS Environmental Monitoring Laboratory	MaS
SLAC01	SLAC DOE National Accelerator Laboratory	MaS

SOUT01	Southwest Research Institute	MaS
SRPD01	Sandia National Laboratories, Radiation Protection Sample Diagnostics	MaS
STRL01	South Texas Project Radiological Laboratory	MaS
TDHL01	Texas Department of State Health Services Laboratory	MaS
TELE01	Teledyne Brown Engineering - Environmental Services	MaS
TELE02	Microbac Laboratories Inc. - Northbrook	MaS
TMAO01	EBERLINE Analytical Corporation	MaS
TNUT01	St. Louis USACE FUSRAP Laboratory	MaS
UNTE01	UniTech-235	MaS
WEST04	PACE ANALYTICAL SERVICES, PITTSBURGH	MaS
WIPH01	WI, DPH, Radiation Protection Section	MaS
WIPP01	WIPP Laboratories	MaS
WSHL01	Wisconsin State Laboratory of Hygiene	MaS
YPGA01	US Army Yuma Proving Ground / Material Analysis Lab	MaS

Laboratories Not Reporting

Lab Code	Lab Name	Matrix Code
AGQL99	Labs & Technological Services AGQ	MaS
ISUP01	ISU - Department of Physics/Health Physics/EAL	MaS
MSDH01	Mississippi State Dept of Health	MaS

Study Reference Values

MAPEP-24-MaS50

Radiological Reference Date: 02/01/2024

Analyte	Ref Value	Ref Unc	Tot Mtl Ref Val	Tot Mtl Ref Unc
Inorganic				Units: (mg/kg)
Antimony	8.4	0.2	9.87	0.10
Arsenic	24.5	0.4	24.5	0.4
Barium	197	4	583	16
Beryllium	23.0	0.4	23.3	0.4
Cadmium	4.74	0.09	4.77	0.09
Chromium	11.7	0.3	29.5	0.9
Cobalt	29.1	0.5	30.5	0.5
Copper	46.3	0.8	53.2	1.4
Lead	23.6	0.3	27.6	0.4
Mercury	0.257	0.005	0.257	0.005
Nickel	33.3	0.6	35.4	1.0
Selenium	8.26	0.16	8.34	0.16
Silver	5.42	0.11	5.6	0.11
Technetium-99	5.32E-4	1E-05		
Thallium	2.85	0.05	3.18	0.06
Uranium-235	0.0317	0.0009		
Uranium-238	8.8	0.3		
Uranium-Total	8.9	0.3		
Vanadium	55.0	1.1	83	3
Zinc	70	2	98	5

Analyte	Ref Value	Ref Unc
Radiological		Units: (Bq/kg)
Cesium-134	404	8
Cesium-137	1550	20
Cobalt-57	401	8
Cobalt-60	660	10
Iron-55	650	14
Manganese-54	332	7
Nickel-63	1530	30
Plutonium-238	34.7	0.8
Plutonium-239/240	0.37	0.04
Plutonium-241		
Potassium-40	485	15
Strontium-90	440	9
Technetium-99	336	7
Thorium-228	48.8	1.9
Thorium-230	54	2
Thorium-232	45.1	1.5
Uranium-234	40.7	1.2
Uranium-238	110	4
Zinc-65	703	14

Sample Statistical Summary

MAPEP-24-MaS50

Radiological Reference Date: 02/01/2024

Analyte	T(1)	A(2)	Grand(3) Mean	Std Dev	Ref Value	Ref Unc	Acceptance Range
Inorganic							Units: (mg/kg)
Antimony	10	6			8.4	0.2	5.9 - 10.9
Arsenic	11	11	23.0	1.4	24.5	0.4	17.2 - 31.9
Barium	10	10	200	11	197	4	138 - 256
Beryllium	11	11	23.1	2.3	23.0	0.4	16.1 - 29.9
Cadmium	11	11	4.80	0.31	4.74	0.09	3.32 - 6.16
Chromium	11	9	13.1	1.8	11.7	0.3	8.2 - 15.2
Cobalt	11	11	28.9	1.9	29.1	0.5	20.4 - 37.8
Copper	11	11	47.6	4.2	46.3	0.8	32.4 - 60.2
Lead	11	11	25.4	1.8	23.6	0.3	16.5 - 30.7
Mercury	10	9	0.237	0.031	0.257	0.005	0.180 - 0.334
Nickel	11	11	33.6	2.3	33.3	0.6	23.3 - 43.3
Selenium	10	10	7.76	1.14	8.26	0.16	5.78 - 10.74
Silver	10	9	5.05	0.43	5.42	0.11	3.79 - 7.05
Technetium-99	3	3			5.32E-4	1E-05	3.72E-4 - 6.92E-4
Thallium	11	9	2.75	0.18	2.85	0.05	2.00 - 3.71
Uranium-235	11	9	0.0309	0.0043	0.0317	0.0009	0.0222 - 0.0412
Uranium-238	11	11	8.5	1.2	8.8	0.3	6.2 - 11.4
Uranium-Total	14	13	8.4	1.3	8.9	0.3	6.2 - 11.6
Vanadium	11	11	54.0	3.4	55.0	1.1	38.5 - 71.5
Zinc	11	10	80	8	70	2	49 - 91

Analyte	T(1)	A(2)	Grand(3) Mean	Std Dev	Ref Value	Ref Unc	Acceptance Range
Radiological							Units: (Bq/kg)
Americium-241	27	25					False Positive Test
Cesium-134	51	47	380	34	404	8	283 - 525
Cesium-137	51	48	1555	122	1550	20	1085 - 2015
Cobalt-57	51	49	399	43	401	8	281 - 521
Cobalt-60	51	49	654	56	660	10	462 - 858
Iron-55	6	3			650	14	455 - 845
Manganese-54	51	49	337	29	332	7	232 - 432
Nickel-63	8	6	1503	211	1530	30	1071 - 1989
Plutonium-238	26	23	34.8	3.6	34.7	0.8	24.3 - 45.1
Plutonium-239/240	25	22	0.55	0.53	0.37	0.04	Sensitivity Evaluation
Plutonium-241	2						
Potassium-40	51	44	487	45	485	15	340 - 631
Strontium-90	22	18	393	37	440	9	308 - 572
Technetium-99	14	12	305	29	336	7	235 - 437
Thorium-228	17	15	47.1	7.0	48.8	1.9	34.2 - 63.4
Thorium-230	17	15	49	5	54	2	38 - 70
Thorium-232	18	17	43.1	5.6	45.1	1.5	31.6 - 58.6
Uranium-234	25	19	41.0	4.2	40.7	1.2	28.5 - 52.9
Uranium-238	28	25	105	11	110	4	77 - 143
Zinc-65	51	49	721	65	703	14	492 - 914

Note: (1) T = Total number of laboratories reporting analyte.
(2) A = Number of laboratories with 'Acceptable' performance.
(3) Mean excludes values derived as total metals and values indicated as "Not Acceptable".

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Flag Summary Report

MAPEP-24-MaS50

Inorganic				
Analyte	**A**	**W**	**RW**	**N**
Antimony	5	1		4
Arsenic	11			
Barium	10			
Beryllium	11			
Cadmium	11			
Chromium	6	3		2
Cobalt	11			
Copper	10	1		
Lead	10	1		
Mercury	6	3		1
Nickel	11			
Selenium	7	3		
Silver	9			1
Thallium	9			2
Uranium-Total	9	4		1
Uranium-235	7	2		2
Uranium-238	10	1		
Vanadium	11			
Zinc	6	4		1
Technetium-99	3			

Radiological				
Analyte	**A**	**W**	**RW**	**N**
Americium-241	25			4
Cesium-134	44	3		2
Cesium-137	47	1		3
Cobalt-57	45	4		2
Cobalt-60	47	2		2
Iron-55	2	1		3
Manganese-54	47	2		2
Nickel-63	5	1		2
Plutonium-238	22	1		3
Plutonium-239/240	22			3
Potassium-40	43	1		7
Strontium-90	17	1		4
Technetium-99	11	1		2
Thorium-228	12	3		2
Thorium-230	14	1		2
Thorium-232	15	2		1
Uranium-234	17	2		6
Uranium-238	24	1		3
Zinc-65	45	4		2

MAPEP Mixed Analyte Performance Evaluation Program
Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-24-MaS50
(ADEM01) Alabama Department of Environmental Management
1350 Coliseum Blvd.
Montgomery, AL 36110

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	8.4				5.9 - 10.9		
Arsenic	NR	24.5				17.2 - 31.9		
Barium	NR	197				138 - 256		
Beryllium	NR	23.0				16.1 - 29.9		
Cadmium	NR	4.74				3.32 - 6.16		
Chromium	NR	11.7				8.2 - 15.2		
Cobalt	NR	29.1				20.4 - 37.8		
Copper	NR	46.3				32.4 - 60.2		
Lead	NR	23.6				16.5 - 30.7		
Mercury	NR	0.257				0.180 - 0.334		
Nickel	NR	33.3				23.3 - 43.3		
Selenium	NR	8.26				5.78 - 10.74		
Silver	NR	5.42				3.79 - 7.05		
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	NR	2.85				2.00 - 3.71		
Uranium-235	NR	0.0317				0.0222 - 0.0412		
Uranium-238	NR	8.8				6.2 - 11.4		
Uranium-Total	NR	8.9				6.2 - 11.6		
Vanadium	NR	55.0				38.5 - 71.5		
Zinc	NR	70				49 - 91		

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	307.0000	404	W		-24.0	283 - 525	2.2900	N
Cesium-137	1280.0000	1550	A		-17.4	1085 - 2015	4.7900	N
Cobalt-57	329.0000	401	A		-18.0	281 - 521	1.3100	N
Cobalt-60	569.0000	660	A		-13.8	462 - 858	2.3800	N
Iron-55	NR	650				455 - 845		
Manganese-54	300.0000	332	A		-9.6	232 - 432	1.9700	N
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	NR	34.7				24.3 - 45.1		
Plutonium-239/240	NR	0.37				Sensitivity Evaluation		
Potassium-40	NR	485	N	(28)		340 - 631		
Strontium-90	NR	440				308 - 572		

Radiological								Units: (Bq/kg)
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	336				235 - 437		
Thorium-228	NR	48.8				34.2 - 63.4		
Thorium-230	NR	54				38 - 70		
Thorium-232	NR	45.1				31.6 - 58.6		
Uranium-234	NR	40.7				28.5 - 52.9		
Uranium-238	NR	110				77 - 143		
Zinc-65	649.0000	703	A		-7.7	492 - 914	8.0700	N

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

MAPEP Mixed Analyte Performance Evaluation Program
Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-24-MaS50
(ADFC99) Abu Dhabi Quality and Conformity Council-Central Testing Lab
Radiation Lab
Abu Dhabi, Abu Dhabi 853

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	8.4				5.9 - 10.9		
Arsenic	NR	24.5				17.2 - 31.9		
Barium	NR	197				138 - 256		
Beryllium	NR	23.0				16.1 - 29.9		
Cadmium	NR	4.74				3.32 - 6.16		
Chromium	NR	11.7				8.2 - 15.2		
Cobalt	NR	29.1				20.4 - 37.8		
Copper	NR	46.3				32.4 - 60.2		
Lead	NR	23.6				16.5 - 30.7		
Mercury	NR	0.257				0.180 - 0.334		
Nickel	NR	33.3				23.3 - 43.3		
Selenium	NR	8.26				5.78 - 10.74		
Silver	NR	5.42				3.79 - 7.05		
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	NR	2.85				2.00 - 3.71		
Uranium-235	NR	0.0317				0.0222 - 0.0412		
Uranium-238	NR	8.8				6.2 - 11.4		
Uranium-Total	NR	8.9				6.2 - 11.6		
Vanadium	NR	55.0				38.5 - 71.5		
Zinc	NR	70				49 - 91		

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	320.25	404	W		-20.7	283 - 525	16	A
Cesium-137	1445.00	1550	A		-6.8	1085 - 2015	58.58	A
Cobalt-57	371.00	401	A		-7.5	281 - 521	13.78	A
Cobalt-60	554.75	660	A		-15.9	462 - 858	15.78	A
Iron-55	NR	650				455 - 845		
Manganese-54	311.75	332	A		-6.1	232 - 432	15.68	A
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	NR	34.7				24.3 - 45.1		
Plutonium-239/240	NR	0.37				Sensitivity Evaluation		
Potassium-40	431.75	485	A		-11.0	340 - 631	23.08	A
Strontium-90	NR	440				308 - 572		

Radiological								Units: (Bq/kg)
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	336				235 - 437		
Thorium-228	NR	48.8				34.2 - 63.4		
Thorium-230	NR	54				38 - 70		
Thorium-232	NR	45.1				31.6 - 58.6		
Uranium-234	NR	40.7				28.5 - 52.9		
Uranium-238	NR	110				77 - 143		
Zinc-65	657.50	703	A		-6.5	492 - 914	33.10	A

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
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(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

MAPEP Mixed Analyte Performance Evaluation Program
Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-24-MaS50
(AFOH01) USAFSAM/OEA
2510 Fifth Street, Area B
Wright-Patterson AFB, OH 45433-7913

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	8.4				5.9 - 10.9		
Arsenic	NR	24.5				17.2 - 31.9		
Barium	NR	197				138 - 256		
Beryllium	NR	23.0				16.1 - 29.9		
Cadmium	NR	4.74				3.32 - 6.16		
Chromium	NR	11.7				8.2 - 15.2		
Cobalt	NR	29.1				20.4 - 37.8		
Copper	NR	46.3				32.4 - 60.2		
Lead	NR	23.6				16.5 - 30.7		
Mercury	NR	0.257				0.180 - 0.334		
Nickel	NR	33.3				23.3 - 43.3		
Selenium	NR	8.26				5.78 - 10.74		
Silver	NR	5.42				3.79 - 7.05		
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	NR	2.85				2.00 - 3.71		
Uranium-235	NR	0.0317				0.0222 - 0.0412		
Uranium-238	NR	8.8				6.2 - 11.4		
Uranium-Total	NR	8.9				6.2 - 11.6		
Vanadium	NR	55.0				38.5 - 71.5		
Zinc	NR	70				49 - 91		

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.6		A			False Positive Test	0.5	
Cesium-134	392	404	A		-3.0	283 - 525	11	A
Cesium-137	1494	1550	A		-3.6	1085 - 2015	39	A
Cobalt-57	399	401	A		-0.5	281 - 521	12	A
Cobalt-60	633	660	A		-4.1	462 - 858	13	A
Iron-55	NR	650				455 - 845		
Manganese-54	319	332	A		-3.9	232 - 432	9	A
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	35.8	34.7	A		3.2	24.3 - 45.1	3.1	A
Plutonium-239/240	0.5	0.37	A	(17)		Sensitivity Evaluation	0.4	
Potassium-40	432	485	A		-10.9	340 - 631	23	A
Strontium-90	435	440	A		-1.1	308 - 572	22	A

Radiological								Units: (Bq/kg)
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	336				235 - 437		
Thorium-228	53.5	48.8	A		9.6	34.2 - 63.4	4.0	A
Thorium-230	49.0	54	A		-9.3	38 - 70	3.7	A
Thorium-232	50.1	45.1	A		11.1	31.6 - 58.6	3.7	A
Uranium-234	42.5	40.7	A		4.4	28.5 - 52.9	3.7	A
Uranium-238	112.4	110	A		2.2	77 - 143	6.8	A
Zinc-65	683	703	A		-2.8	492 - 914	16	A

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

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N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

Laboratory Results For MAPEP-24-MaS50
(AMEC99) Jacobs Clean Energy Limited - Analytical Services
612 Faraday Street
Birchwood Park, Warrington WA3 6GN

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	8.4				5.9 - 10.9		
Arsenic	NR	24.5				17.2 - 31.9		
Barium	NR	197				138 - 256		
Beryllium	NR	23.0				16.1 - 29.9		
Cadmium	NR	4.74				3.32 - 6.16		
Chromium	NR	11.7				8.2 - 15.2		
Cobalt	NR	29.1				20.4 - 37.8		
Copper	NR	46.3				32.4 - 60.2		
Lead	NR	23.6				16.5 - 30.7		
Mercury	NR	0.257				0.180 - 0.334		
Nickel	NR	33.3				23.3 - 43.3		
Selenium	NR	8.26				5.78 - 10.74		
Silver	NR	5.42				3.79 - 7.05		
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	NR	2.85				2.00 - 3.71		
Uranium-235	NR	0.0317				0.0222 - 0.0412		
Uranium-238	NR	8.8				6.2 - 11.4		
Uranium-Total	NR	8.9				6.2 - 11.6		
Vanadium	NR	55.0				38.5 - 71.5		
Zinc	NR	70				49 - 91		

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.455		A			False Positive Test	0.455	
Cesium-134	369	404	A		-8.7	283 - 525	11	A
Cesium-137	1536	1550	A		-0.9	1085 - 2015	40	A
Cobalt-57	370	401	A		-7.7	281 - 521	14	A
Cobalt-60	652	660	A		-1.2	462 - 858	16	A
Iron-55	719	650	A		10.6	455 - 845	63	A
Manganese-54	332.2	332	A		0.1	232 - 432	8.9	A
Nickel-63	1450	1530	A		-5.2	1071 - 1989	80	A
Plutonium-238	31.6	34.7	A		-8.9	24.3 - 45.1	1.2	A
Plutonium-239/240	0.50	0.37	A			Sensitivity Evaluation	0.14	
Potassium-40	3340	485	N		588.7	340 - 631	140	A
Strontium-90	422	440	A		-4.1	308 - 572	51	A

Radiological — Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	301	336	A		-10.4	235 - 437	37	A
Thorium-228	35.9	48.8	W		-26.4	34.2 - 63.4	2.0	A
Thorium-230	49.1	54	A		-9.1	38 - 70	2.4	A
Thorium-232	35.8	45.1	W		-20.6	31.6 - 58.6	2.0	A
Uranium-234	38.8	40.7	A		-4.7	28.5 - 52.9	1.3	A
Uranium-238	100.0	110	A		-9.1	77 - 143	2.9	A
Zinc-65	733	703	A		4.3	492 - 914	19	A

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

Laboratory Results For MAPEP-24-MaS50
(ARGO01) Idaho National Laboratory
INL, Materials and Fuels Complex
Idaho Falls, ID 83415

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	8.4				5.9 - 10.9		
Arsenic	NR	24.5				17.2 - 31.9		
Barium	NR	197				138 - 256		
Beryllium	NR	23.0				16.1 - 29.9		
Cadmium	NR	4.74				3.32 - 6.16		
Chromium	NR	11.7				8.2 - 15.2		
Cobalt	NR	29.1				20.4 - 37.8		
Copper	NR	46.3				32.4 - 60.2		
Lead	NR	23.6				16.5 - 30.7		
Mercury	NR	0.257				0.180 - 0.334		
Nickel	NR	33.3				23.3 - 43.3		
Selenium	NR	8.26				5.78 - 10.74		
Silver	NR	5.42				3.79 - 7.05		
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	NR	2.85				2.00 - 3.71		
Uranium-235	NR	0.0317				0.0222 - 0.0412		
Uranium-238	NR	8.8				6.2 - 11.4		
Uranium-Total	NR	8.9				6.2 - 11.6		
Vanadium	NR	55.0				38.5 - 71.5		
Zinc	NR	70				49 - 91		

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	37		A			False Positive Test	37	
Cesium-134	381	404	A		-5.7	283 - 525	11	A
Cesium-137	1664	1550	A		7.4	1085 - 2015	50	A
Cobalt-57	432	401	A		7.7	281 - 521	8.7	A
Cobalt-60	698	660	A		5.8	462 - 858	14	A
Iron-55	NR	650				455 - 845		
Manganese-54	364	332	A		9.6	232 - 432	7.3	A
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	NR	34.7				24.3 - 45.1		
Plutonium-239/240	NR	0.37				Sensitivity Evaluation		
Potassium-40	537	485	A		10.7	340 - 631	32	A
Strontium-90	NR	440				308 - 572		

Radiological									Units: (Bq/kg)
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag	
Technetium-99	NR	336				235 - 437			
Thorium-228	NR	48.8				34.2 - 63.4			
Thorium-230	NR	54				38 - 70			
Thorium-232	NR	45.1				31.6 - 58.6			
Uranium-234	NR	40.7				28.5 - 52.9			
Uranium-238	NR	110				77 - 143			
Zinc-65	804	703	A		14.4	492 - 914	16	N	

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

Laboratory Results For MAPEP-24-MaS50
(ARPL01) Analytical Support Operations - Radiochemical Processing Lab
PO Box 999
Richland, WA 99354

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	8.4				5.9 - 10.9		
Arsenic	NR	24.5				17.2 - 31.9		
Barium	NR	197				138 - 256		
Beryllium	NR	23.0				16.1 - 29.9		
Cadmium	NR	4.74				3.32 - 6.16		
Chromium	NR	11.7				8.2 - 15.2		
Cobalt	NR	29.1				20.4 - 37.8		
Copper	NR	46.3				32.4 - 60.2		
Lead	NR	23.6				16.5 - 30.7		
Mercury	NR	0.257				0.180 - 0.334		
Nickel	NR	33.3				23.3 - 43.3		
Selenium	NR	8.26				5.78 - 10.74		
Silver	NR	5.42				3.79 - 7.05		
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	NR	2.85				2.00 - 3.71		
Uranium-235	NR	0.0317				0.0222 - 0.0412		
Uranium-238	NR	8.8				6.2 - 11.4		
Uranium-Total	NR	8.9				6.2 - 11.6		
Vanadium	NR	55.0				38.5 - 71.5		
Zinc	NR	70				49 - 91		

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	335.4	404	A		-17.0	283 - 525	13.7	A
Cesium-137	1336.2	1550	A		-13.8	1085 - 2015	51.8	A
Cobalt-57	332.8	401	A		-17.0	281 - 521	11.7	A
Cobalt-60	579.0	660	A		-12.3	462 - 858	27.3	A
Iron-55	NR	650				455 - 845		
Manganese-54	291.8	332	A		-12.1	232 - 432	11.7	A
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	NR	34.7				24.3 - 45.1		
Plutonium-239/240	NR	0.37				Sensitivity Evaluation		
Potassium-40	409.3	485	A		-15.6	340 - 631	17.8	A
Strontium-90	NR	440				308 - 572		

Radiological								Units: (Bq/kg)
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	336				235 - 437		
Thorium-228	NR	48.8				34.2 - 63.4		
Thorium-230	NR	54				38 - 70		
Thorium-232	NR	45.1				31.6 - 58.6		
Uranium-234	NR	40.7				28.5 - 52.9		
Uranium-238	NR	110				77 - 143		
Zinc-65	636.0	703	A		-9.5	492 - 914	27.0	A

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

MAPEP Mixed Analyte Performance Evaluation Program
Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-24-MaS50
(ARSL01) ARS
2609 North River Road
Port Allen, LA 70767

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	7.39	8.4	A		-12.0	5.9 - 10.9	0.664861	A
Arsenic	21.4	24.5	A		-12.7	17.2 - 31.9	2.864363	A
Barium	190.62	197	A		-3.2	138 - 256	21.58246	A
Beryllium	23.744 1	23.0	A		3.2	16.1 - 29.9	3.140171	A
Cadmium	4.503	4.74	A		-5.0	3.32 - 6.16	0.485324	A
Chromium	13.256	11.7	A		13.3	8.2 - 15.2	1.396577	A
Cobalt	29.092	29.1	A		0.0	20.4 - 37.8	3.504732	A
Copper	44.7	46.3	A		-3.5	32.4 - 60.2	6.003134	A
Lead	24.095	23.6	A		2.1	16.5 - 30.7	3.353390	A
Mercury	0.205	0.257	W		-20.2	0.180 - 0.334	0.014167	A
Nickel	34.966	33.3	A		5.0	23.3 - 43.3	4.947152	A
Selenium	6.013	8.26	W		-27.2	5.78 - 10.74	0.772038	A
Silver	4.409	5.42	A		-18.7	3.79 - 7.05	0.457616	A
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	2.612	2.85	A		-8.4	2.00 - 3.71	0.295173	A
Uranium-235	NR	0.0317				0.0222 - 0.0412		
Uranium-238	NR	8.8				6.2 - 11.4		
Uranium-Total	2.612	8.9	N		-70.7	6.2 - 11.6	0.295173	A
Vanadium	47.312	55.0	A		-14.0	38.5 - 71.5	5.712585	A
Zinc	77.619	70	A		10.9	49 - 91	9.478214	A

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	2.45		A			False Positive Test	1.156	
Cesium-134	353.7	404	A		-12.5	283 - 525	11.685	A
Cesium-137	1465.8	1550	A		-5.4	1085 - 2015	32.861	A
Cobalt-57	375.39	401	A		-6.4	281 - 521	13.284	A
Cobalt-60	648.91	660	A		-1.7	462 - 858	12.481	N
Iron-55	NR	650				455 - 845		
Manganese-54	323.42	332	A		-2.6	232 - 432	10.746	A
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	40.288	34.7	A		16.1	24.3 - 45.1	4.05	A
Plutonium-239/240	-0.966	0.37	A	(17)		Sensitivity Evaluation	0.456	
Potassium-40	535.05	485	A		10.3	340 - 631	20.209	A
Strontium-90	411.325	440	A		-6.5	308 - 572	33.285	A

Radiological								Units: (Bq/kg)
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	278.272	336	A		-17.2	235 - 437	34.857	A
Thorium-228	NR	48.8				34.2 - 63.4		
Thorium-230	NR	54				38 - 70		
Thorium-232	NR	45.1				31.6 - 58.6		
Uranium-234	26.393	40.7	N		-35.2	28.5 - 52.9	2.881	A
Uranium-238	91.782	110	A		-16.6	77 - 143	7.141	A
Zinc-65	720	703	A		2.4	492 - 914	23.464	A

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

Laboratory Results For MAPEP-24-MaS50
(ASUK99) AWE (Aldermaston)
A38.1 AWE
Reading, Berkshire RG7 4PR

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	8.4				5.9 - 10.9		
Arsenic	NR	24.5				17.2 - 31.9		
Barium	NR	197				138 - 256		
Beryllium	NR	23.0				16.1 - 29.9		
Cadmium	NR	4.74				3.32 - 6.16		
Chromium	NR	11.7				8.2 - 15.2		
Cobalt	NR	29.1				20.4 - 37.8		
Copper	NR	46.3				32.4 - 60.2		
Lead	NR	23.6				16.5 - 30.7		
Mercury	NR	0.257				0.180 - 0.334		
Nickel	NR	33.3				23.3 - 43.3		
Selenium	NR	8.26				5.78 - 10.74		
Silver	NR	5.42				3.79 - 7.05		
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	NR	2.85				2.00 - 3.71		
Uranium-235	NR	0.0317				0.0222 - 0.0412		
Uranium-238	NR	8.8				6.2 - 11.4		
Uranium-Total	NR	8.9				6.2 - 11.6		
Vanadium	NR	55.0				38.5 - 71.5		
Zinc	NR	70				49 - 91		

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	NR	404				283 - 525		
Cesium-137	NR	1550				1085 - 2015		
Cobalt-57	NR	401				281 - 521		
Cobalt-60	NR	660				462 - 858		
Iron-55	NR	650				455 - 845		
Manganese-54	NR	332				232 - 432		
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	29.51	34.7	A		-15.0	24.3 - 45.1	4.52	W
Plutonium-239/240	0.028	0.37	A	(17)		Sensitivity Evaluation	0.094	
Potassium-40	NR	485				340 - 631		
Strontium-90	NR	440				308 - 572		

Radiological — Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	336				235 - 437		
Thorium-228	NR	48.8				34.2 - 63.4		
Thorium-230	NR	54				38 - 70		
Thorium-232	NR	45.1				31.6 - 58.6		
Uranium-234	26.17	40.7	N		-35.7	28.5 - 52.9	3.78	A
Uranium-238	88.95	110	A		-19.1	77 - 143	12.47	A
Zinc-65	NR	703				492 - 914		

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

MAPEP Mixed Analyte Performance Evaluation Program

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

Laboratory Results For MAPEP-24-MaS50
(AY1201) Consolidated Nuclear Security, LLC, ACO Laboratory
Y12, NSC, Bldg. 9995, Rm 142
Oak Ridge, TN 37831-8189

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	8.5	8.4	A		1.2	5.9 - 10.9	0.449	A
Arsenic	24.5	24.5	A		0.0	17.2 - 31.9	1.377	A
Barium	213	197	A		8.1	138 - 256	8.669	A
Beryllium	23.8	23.0	A		3.5	16.1 - 29.9	3.249	A
Cadmium	4.75	4.74	A		0.2	3.32 - 6.16	0.529	A
Chromium	14.7	11.7	W		25.6	8.2 - 15.2	1.636	A
Cobalt	29.2	29.1	A		0.3	20.4 - 37.8	1.46	A
Copper	48.2	46.3	A		4.1	32.4 - 60.2	1.986	A
Lead	26.0	23.6	A		10.2	16.5 - 30.7	2.543	A
Mercury	0.261	0.257	A		1.6	0.180 - 0.334	0.0273	A
Nickel	34.5	33.3	A		3.6	23.3 - 43.3	1.704	A
Selenium	6.48	8.26	W		-21.6	5.78 - 10.74	1.051	W
Silver	5.22	5.42	A		-3.7	3.79 - 7.05	0.533	A
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	2.86	2.85	A		0.4	2.00 - 3.71	0.352	A
Uranium-235	0.035	0.0317	A		10.4	0.0222 - 0.0412	0.0035	A
Uranium-238	9.51	8.8	A		8.1	6.2 - 11.4	0.5	A
Uranium-Total	9.54	8.9	A		7.2	6.2 - 11.6	0.5	A
Vanadium	54.1	55.0	A		-1.6	38.5 - 71.5	2.056	A
Zinc	86.3	70	W		23.3	49 - 91	5.402	A

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.523		A			False Positive Test	0.73	
Cesium-134	NR	404		(6)		283 - 525		
Cesium-137	1694	1550	A		9.3	1085 - 2015	52	A
Cobalt-57	448	401	A		11.7	281 - 521	12	A
Cobalt-60	718	660	A		8.8	462 - 858	15	A
Iron-55	NR	650				455 - 845		
Manganese-54	376	332	A		13.3	232 - 432	115	N
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	36.7	34.7	A		5.8	24.3 - 45.1	3.2	A
Plutonium-239/240	0.823	0.37	A	(17)		Sensitivity Evaluation	0.37	
Potassium-40	572	485	A		17.9	340 - 631	49	A
Strontium-90	386	440	A		-12.3	308 - 572	17	A

Radiological								Units: (Bq/kg)
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	222	336	N		-33.9	235 - 437	18	A
Thorium-228	41.9	48.8	A		-14.1	34.2 - 63.4	3.2	A
Thorium-230	49.8	54	A		-7.8	38 - 70	3.6	A
Thorium-232	39.5	45.1	A		-12.4	31.6 - 58.6	3.0	A
Uranium-234	49.8	40.7	W		22.4	28.5 - 52.9	3.3	A
Uranium-238	114	110	A		3.6	77 - 143	6.3	A
Zinc-65	827	703	A		17.6	492 - 914	117	A

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

MAPEP Mixed Analyte Performance Evaluation Program

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

Laboratory Results For MAPEP-24-MaS50
(BY1201) Consolidated Nuclear Security, LLC, ACO, Production Laboratory
Y12, NSC, Bldg. 9995, Rm 142
Oak Ridge, TN 37831-8189

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	8.4				5.9 - 10.9		
Arsenic	NR	24.5				17.2 - 31.9		
Barium	NR	197				138 - 256		
Beryllium	NR	23.0				16.1 - 29.9		
Cadmium	NR	4.74				3.32 - 6.16		
Chromium	NR	11.7				8.2 - 15.2		
Cobalt	NR	29.1				20.4 - 37.8		
Copper	NR	46.3				32.4 - 60.2		
Lead	NR	23.6				16.5 - 30.7		
Mercury	NR	0.257				0.180 - 0.334		
Nickel	NR	33.3				23.3 - 43.3		
Selenium	NR	8.26				5.78 - 10.74		
Silver	NR	5.42				3.79 - 7.05		
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	NR	2.85				2.00 - 3.71		
Uranium-235	NR	0.0317				0.0222 - 0.0412		
Uranium-238	NR	8.8				6.2 - 11.4		
Uranium-Total	NR	8.9				6.2 - 11.6		
Vanadium	NR	55.0				38.5 - 71.5		
Zinc	NR	70				49 - 91		

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	-.028		A			False Positive Test	.497	
Cesium-134	NR	404		(6)		283 - 525		
Cesium-137	1616.67	1550	A		4.3	1085 - 2015	43.67	A
Cobalt-57	430	401	A		7.2	281 - 521	5.72	N
Cobalt-60	626	660	A		-5.2	462 - 858	16.97	A
Iron-55	NR	650				455 - 845		
Manganese-54	342.3	332	A		3.1	232 - 432	10.57	A
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	39.2	34.7	A		13.0	24.3 - 45.1	4.33	A
Plutonium-239/240	1.58	0.37	A	(17)		Sensitivity Evaluation	.81	
Potassium-40	511	485	A		5.4	340 - 631	26.2	A
Strontium-90	352.01	440	A		-20.0	308 - 572	25.9	A

Radiological — Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	279	336	A		-17.0	235 - 437	22.63	A
Thorium-228	44.4	48.8	A		-9.0	34.2 - 63.4	6.4	A
Thorium-230	44.9	54	A		-16.9	38 - 70	6.45	A
Thorium-232	38.3	45.1	A		-15.1	31.6 - 58.6	5.7	A
Uranium-234	74.8	40.7	N		83.8	28.5 - 52.9	7.75	A
Uranium-238	209	110	N		90.0	77 - 143	16.35	A
Zinc-65	737	703	A		4.8	492 - 914	27.37	A

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

MAPEP Mixed Analyte Performance Evaluation Program
Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-24-MaS50
(CESL01) Lawrence Livermore National Laboratory - EMRL
7000 East Avenue
Livermore, CA 94551

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	8.4				5.9 - 10.9		
Arsenic	NR	24.5				17.2 - 31.9		
Barium	NR	197				138 - 256		
Beryllium	NR	23.0				16.1 - 29.9		
Cadmium	NR	4.74				3.32 - 6.16		
Chromium	NR	11.7				8.2 - 15.2		
Cobalt	NR	29.1				20.4 - 37.8		
Copper	NR	46.3				32.4 - 60.2		
Lead	NR	23.6				16.5 - 30.7		
Mercury	NR	0.257				0.180 - 0.334		
Nickel	NR	33.3				23.3 - 43.3		
Selenium	NR	8.26				5.78 - 10.74		
Silver	NR	5.42				3.79 - 7.05		
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	NR	2.85				2.00 - 3.71		
Uranium-235	NR	0.0317				0.0222 - 0.0412		
Uranium-238	NR	8.8				6.2 - 11.4		
Uranium-Total	NR	8.9				6.2 - 11.6		
Vanadium	NR	55.0				38.5 - 71.5		
Zinc	NR	70				49 - 91		

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	3.93E+02	404	A		-2.7	283 - 525	9.88	A
Cesium-137	1.55E+03	1550	A		0.0	1085 - 2015	6.42	A
Cobalt-57	3.93E+02	401	A		-2.0	281 - 521	1.28	A
Cobalt-60	6.59E+02	660	A		-0.2	462 - 858	1.56	A
Iron-55	NR	650				455 - 845		
Manganese-54	3.24E+02	332	A		-2.4	232 - 432	1.22	A
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	3.71E+01	34.7	A		6.9	24.3 - 45.1	7.86E-01	A
Plutonium-239/240	4.53E-01	0.37	A			Sensitivity Evaluation	9.17E-02	
Potassium-40	4.83E+02	485	A		-0.4	340 - 631	3.88	A
Strontium-90	NR	440				308 - 572		

Radiological								Units: (Bq/kg)
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	336				235 - 437		
Thorium-228	NR	48.8				34.2 - 63.4		
Thorium-230	NR	54				38 - 70		
Thorium-232	NR	45.1				31.6 - 58.6		
Uranium-234	NR	40.7				28.5 - 52.9		
Uranium-238	NR	110				77 - 143		
Zinc-65	6.66E+02	703	A		-5.3	492 - 914	2.63	A

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

Laboratory Results For MAPEP-24-MaS50
(CMRC01) Carlsbad Environmental Monitoring and Research Center
1400 University Dr.
Carlsbad, NM 88220

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	8.4				5.9 - 10.9		
Arsenic	NR	24.5				17.2 - 31.9		
Barium	NR	197				138 - 256		
Beryllium	NR	23.0				16.1 - 29.9		
Cadmium	NR	4.74				3.32 - 6.16		
Chromium	NR	11.7				8.2 - 15.2		
Cobalt	NR	29.1				20.4 - 37.8		
Copper	NR	46.3				32.4 - 60.2		
Lead	NR	23.6				16.5 - 30.7		
Mercury	NR	0.257				0.180 - 0.334		
Nickel	NR	33.3				23.3 - 43.3		
Selenium	NR	8.26				5.78 - 10.74		
Silver	NR	5.42				3.79 - 7.05		
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	NR	2.85				2.00 - 3.71		
Uranium-235	NR	0.0317				0.0222 - 0.0412		
Uranium-238	NR	8.8				6.2 - 11.4		
Uranium-Total	NR	8.9				6.2 - 11.6		
Vanadium	NR	55.0				38.5 - 71.5		
Zinc	NR	70				49 - 91		

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	2.47E+00		A			False Positive Test	4.75	
Cesium-134	NR	404	N	(25)		283 - 525		
Cesium-137	9.70E+02	1550	N		-37.4	1085 - 2015	3.16	A
Cobalt-57	NR	401	N	(25)		281 - 521		
Cobalt-60	3.68E+02	660	N		-44.2	462 - 858	1.70	A
Iron-55	NR	650				455 - 845		
Manganese-54	NR	332	N	(25)		232 - 432		
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	4.21E+01	34.7	W		21.3	24.3 - 45.1	2.90	A
Plutonium-239/240	NR	0.37				Sensitivity Evaluation		
Potassium-40	2.97E+02	485	N		-38.8	340 - 631	1.85	A
Strontium-90	8.94E+02	440	N		103.2	308 - 572	1.07	N

Radiological — Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	336				235 - 437		
Thorium-228	NR	48.8				34.2 - 63.4		
Thorium-230	NR	54				38 - 70		
Thorium-232	NR	45.1				31.6 - 58.6		
Uranium-234	5.68E+01	40.7	N		39.6	28.5 - 52.9	2.70	A
Uranium-238	1.54E+02	110	N		40.0	77 - 143	6.94	A
Zinc-65	NR	703	N	(25)		492 - 914		

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

MAPEP Mixed Analyte Performance Evaluation Program
Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-24-MaS50
(COPS99) Health Canada Radiation Protection Bureau
775 Brookfield Road
Ottawa, Ontario K1A 1C1

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	8.4				5.9 - 10.9		
Arsenic	NR	24.5				17.2 - 31.9		
Barium	NR	197				138 - 256		
Beryllium	NR	23.0				16.1 - 29.9		
Cadmium	NR	4.74				3.32 - 6.16		
Chromium	NR	11.7				8.2 - 15.2		
Cobalt	NR	29.1				20.4 - 37.8		
Copper	NR	46.3				32.4 - 60.2		
Lead	NR	23.6				16.5 - 30.7		
Mercury	NR	0.257				0.180 - 0.334		
Nickel	NR	33.3				23.3 - 43.3		
Selenium	NR	8.26				5.78 - 10.74		
Silver	NR	5.42				3.79 - 7.05		
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	NR	2.85				2.00 - 3.71		
Uranium-235	NR	0.0317				0.0222 - 0.0412		
Uranium-238	NR	8.8				6.2 - 11.4		
Uranium-Total	NR	8.9				6.2 - 11.6		
Vanadium	NR	55.0				38.5 - 71.5		
Zinc	NR	70				49 - 91		

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	437.3	404	A		8.2	283 - 525	7.87	N
Cesium-137	1592	1550	A		2.7	1085 - 2015	95.5	A
Cobalt-57	426.3	401	A		6.3	281 - 521	28.99	A
Cobalt-60	722.9	660	A		9.5	462 - 858	17.35	A
Iron-55	NR	650				455 - 845		
Manganese-54	342.7	332	A		3.2	232 - 432	20.56	A
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	NR	34.7				24.3 - 45.1		
Plutonium-239/240	NR	0.37				Sensitivity Evaluation		
Potassium-40	473.4	485	A		-2.4	340 - 631	20.83	A
Strontium-90	NR	440				308 - 572		

Radiological								Units: (Bq/kg)
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	336				235 - 437		
Thorium-228	NR	48.8				34.2 - 63.4		
Thorium-230	NR	54				38 - 70		
Thorium-232	NR	45.1				31.6 - 58.6		
Uranium-234	NR	40.7				28.5 - 52.9		
Uranium-238	NR	110				77 - 143		
Zinc-65	731.4	703	A		4.0	492 - 914	31.45	A

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

MAPEP Mixed Analyte Performance Evaluation Program

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

Laboratory Results For MAPEP-24-MaS50
(EFGS01) Eurofins Frontier Global Sciences, LLC.
5755 8th St. E
Tacoma, WA 98424

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	8.4				5.9 - 10.9		
Arsenic	NR	24.5				17.2 - 31.9		
Barium	NR	197				138 - 256		
Beryllium	NR	23.0				16.1 - 29.9		
Cadmium	NR	4.74				3.32 - 6.16		
Chromium	NR	11.7				8.2 - 15.2		
Cobalt	NR	29.1				20.4 - 37.8		
Copper	NR	46.3				32.4 - 60.2		
Lead	NR	23.6				16.5 - 30.7		
Mercury	0.2	0.257	W		-22.2	0.180 - 0.334	0.006038	A
Nickel	NR	33.3				23.3 - 43.3		
Selenium	NR	8.26				5.78 - 10.74		
Silver	NR	5.42				3.79 - 7.05		
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	NR	2.85				2.00 - 3.71		
Uranium-235	NR	0.0317				0.0222 - 0.0412		
Uranium-238	NR	8.8				6.2 - 11.4		
Uranium-Total	NR	8.9				6.2 - 11.6		
Vanadium	NR	55.0				38.5 - 71.5		
Zinc	NR	70				49 - 91		

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	NR	404				283 - 525		
Cesium-137	NR	1550				1085 - 2015		
Cobalt-57	NR	401				281 - 521		
Cobalt-60	NR	660				462 - 858		
Iron-55	NR	650				455 - 845		
Manganese-54	NR	332				232 - 432		
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	NR	34.7				24.3 - 45.1		
Plutonium-239/240	NR	0.37				Sensitivity Evaluation		
Potassium-40	NR	485				340 - 631		
Strontium-90	NR	440				308 - 572		

Radiological								Units: (Bq/kg)
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	336				235 - 437		
Thorium-228	NR	48.8				34.2 - 63.4		
Thorium-230	NR	54				38 - 70		
Thorium-232	NR	45.1				31.6 - 58.6		
Uranium-234	NR	40.7				28.5 - 52.9		
Uranium-238	NR	110				77 - 143		
Zinc-65	NR	703				492 - 914		

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

MAPEP Mixed Analyte Performance Evaluation Program

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

Laboratory Results For MAPEP-24-MaS50
(ERCL01) Washington State Public Health Laboratories
1610 N.E. 150th Street
Shoreline, WA 98155-9701

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	8.4				5.9 - 10.9		
Arsenic	NR	24.5				17.2 - 31.9		
Barium	NR	197				138 - 256		
Beryllium	NR	23.0				16.1 - 29.9		
Cadmium	NR	4.74				3.32 - 6.16		
Chromium	NR	11.7				8.2 - 15.2		
Cobalt	NR	29.1				20.4 - 37.8		
Copper	NR	46.3				32.4 - 60.2		
Lead	NR	23.6				16.5 - 30.7		
Mercury	NR	0.257				0.180 - 0.334		
Nickel	NR	33.3				23.3 - 43.3		
Selenium	NR	8.26				5.78 - 10.74		
Silver	NR	5.42				3.79 - 7.05		
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	NR	2.85				2.00 - 3.71		
Uranium-235	0.0347	0.0317	A		9.5	0.0222 - 0.0412	0.0027	A
Uranium-238	9.90	8.8	A		12.5	6.2 - 11.4	0.66	A
Uranium-Total	10.0	8.9	A		12.4	6.2 - 11.6	0.7	A
Vanadium	NR	55.0				38.5 - 71.5		
Zinc	NR	70				49 - 91		

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	-1.11		A			False Positive Test	0.42	
Cesium-134	414	404	A		2.5	283 - 525	9	A
Cesium-137	1730	1550	A		11.6	1085 - 2015	30	N
Cobalt-57	429	401	A		7.0	281 - 521	6	N
Cobalt-60	725	660	A		9.8	462 - 858	38	A
Iron-55	NR	650				455 - 845		
Manganese-54	377	332	A		13.6	232 - 432	23	A
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	35.5	34.7	A		2.3	24.3 - 45.1	2.1	A
Plutonium-239/240	0.63	0.37	A	(17)		Sensitivity Evaluation	0.45	
Potassium-40	481	485	A		-0.8	340 - 631	26	A
Strontium-90	360	440	A		-18.2	308 - 572	11	A

Radiological								Units: (Bq/kg)
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	336				235 - 437		
Thorium-228	51.4	48.8	A		5.3	34.2 - 63.4	4.3	A
Thorium-230	48.1	54	A		-10.9	38 - 70	4.0	A
Thorium-232	44.8	45.1	A		-0.7	31.6 - 58.6	3.8	A
Uranium-234	41.8	40.7	A		2.7	28.5 - 52.9	2.4	A
Uranium-238	108	110	A		-1.8	77 - 143	5	A
Zinc-65	755	703	A		7.4	492 - 914	9	N

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

Laboratory Results For MAPEP-24-MaS50
(ERHD99) National Monitoring Section, Radiation Protection Bureau, Health Canada
775 Brookfield Road AL6302D1
Ottawa, Ontario K1A 1C1

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	-0.004	8.4	N		-100.0	5.9 - 10.9	0.01	N
Arsenic	24.1	24.5	A		-1.6	17.2 - 31.9	1.7	A
Barium	NR	197				138 - 256		
Beryllium	21.8	23.0	A		-5.2	16.1 - 29.9	0.27	N
Cadmium	4.57	4.74	A		-3.6	3.32 - 6.16	0.02	N
Chromium	94.8	11.7	N		710.3	8.2 - 15.2	1.5	N
Cobalt	26.4	29.1	A		-9.3	20.4 - 37.8	0.63	A
Copper	45.1	46.3	A		-2.6	32.4 - 60.2	0.8	N
Lead	23.8	23.6	A		0.8	16.5 - 30.7	0.17	N
Mercury	NR	0.257				0.180 - 0.334		
Nickel	29.7	33.3	A		-10.8	23.3 - 43.3	2.01	A
Selenium	7.1	8.26	A		-14.0	5.78 - 10.74	0.3	A
Silver	4.54	5.42	A		-16.2	3.79 - 7.05	0.04	N
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	2.92	2.85	A		2.5	2.00 - 3.71	0.03	N
Uranium-235	0.021	0.0317	N		-33.8	0.0222 - 0.0412	0.0005	A
Uranium-238	7.241	8.8	A		-17.7	6.2 - 11.4	.17	A
Uranium-Total	NR	8.9				6.2 - 11.6		
Vanadium	53.1	55.0	A		-3.5	38.5 - 71.5	1.03	N
Zinc	85.2	70	W		21.7	49 - 91	3.1	A

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.92		A			False Positive Test	1.85	
Cesium-134	426	404	A		5.4	283 - 525	15	A
Cesium-137	1657	1550	A		6.9	1085 - 2015	100	A
Cobalt-57	453	401	A		13.0	281 - 521	21	A
Cobalt-60	759	660	A		15.0	462 - 858	37	A
Iron-55	NR	650				455 - 845		
Manganese-54	356	332	A		7.2	232 - 432	21	A
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	33.6	34.7	A		-3.2	24.3 - 45.1	1.4	A
Plutonium-239/240	0.22	0.37	A	(17)		Sensitivity Evaluation	0.25	
Potassium-40	489	485	A		0.8	340 - 631	30	A
Strontium-90	460	440	A		4.5	308 - 572	25	A

Radiological								Units: (Bq/kg)
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	336				235 - 437		
Thorium-228	NR	48.8				34.2 - 63.4		
Thorium-230	NR	54				38 - 70		
Thorium-232	NR	45.1				31.6 - 58.6		
Uranium-234	45.0	40.7	A		10.6	28.5 - 52.9	1.8	A
Uranium-238	117.6	110	A		6.9	77 - 143	3.0	A
Zinc-65	781	703	A		11.1	492 - 914	47	A

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

MAPEP Mixed Analyte Performance Evaluation Program
Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-24-MaS50
(ETTP01) MCLinc
161 Mitchell Road
Oak Ridge, Tennessee 37830

Inorganic — Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	16.3	8.4	N		94.0	5.9 - 10.9	0.82	A
Arsenic	20.8	24.5	A		-15.1	17.2 - 31.9	1.9	A
Barium	190	197	A		-3.6	138 - 256	12	A
Beryllium	26.4	23.0	A		14.8	16.1 - 29.9	0.78	A
Cadmium	5.34	4.74	A		12.7	3.32 - 6.16	0.25	A
Chromium	9.84	11.7	A		-15.9	8.2 - 15.2	0.62	A
Cobalt	32.1	29.1	A		10.3	20.4 - 37.8	3.3	A
Copper	55.8	46.3	W		20.5	32.4 - 60.2	3.2	A
Lead	29.6	23.6	W		25.4	16.5 - 30.7	3.9	A
Mercury	0.230	0.257	A		-10.5	0.180 - 0.334	0.011	A
Nickel	32.5	33.3	A		-2.4	23.3 - 43.3	1.3	A
Selenium	9.76	8.26	A		18.2	5.78 - 10.74	1.1	A
Silver	3.58	5.42	N		-33.9	3.79 - 7.05	0.23	A
Technetium-99	0.000459	5.32E-04	A		-13.7	3.72E-4 - 6.92E-4	0.00002	A
Thallium	63.3	2.85	N		2121.1	2.00 - 3.71	3.2	A
Uranium-235	0.0340	0.0317	A		7.3	0.0222 - 0.0412	0.0017	A
Uranium-238	9.58	8.8	A		8.9	6.2 - 11.4	0.48	A
Uranium-Total	9.61	8.9	A		8.0	6.2 - 11.6	0.48	A
Vanadium	57.6	55.0	A		4.7	38.5 - 71.5	3.5	A
Zinc	80.3	70	A		14.7	49 - 91	4.7	A

Radiological — Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	NR	404				283 - 525		
Cesium-137	NR	1550				1085 - 2015		
Cobalt-57	NR	401				281 - 521		
Cobalt-60	NR	660				462 - 858		
Iron-55	NR	650				455 - 845		
Manganese-54	NR	332				232 - 432		
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	NR	34.7				24.3 - 45.1		
Plutonium-239/240	NR	0.37				Sensitivity Evaluation		
Potassium-40	NR	485				340 - 631		
Strontium-90	NR	440				308 - 572		

Radiological								Units: (Bq/kg)
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	287	336	A		-14.6	235 - 437	14	A
Thorium-228	NR	48.8				34.2 - 63.4		
Thorium-230	NR	54				38 - 70		
Thorium-232	NR	45.1				31.6 - 58.6		
Uranium-234	NR	40.7				28.5 - 52.9		
Uranium-238	NR	110				77 - 143		
Zinc-65	NR	703				492 - 914		

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

Laboratory Results For MAPEP-24-MaS50
(FDHE01) Florida Dept of Health Environmental Laboratory
2100 All Childrens Way
Orlando, FL 32818-5271

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	8.4				5.9 - 10.9		
Arsenic	NR	24.5				17.2 - 31.9		
Barium	NR	197				138 - 256		
Beryllium	NR	23.0				16.1 - 29.9		
Cadmium	NR	4.74				3.32 - 6.16		
Chromium	NR	11.7				8.2 - 15.2		
Cobalt	NR	29.1				20.4 - 37.8		
Copper	NR	46.3				32.4 - 60.2		
Lead	NR	23.6				16.5 - 30.7		
Mercury	NR	0.257				0.180 - 0.334		
Nickel	NR	33.3				23.3 - 43.3		
Selenium	NR	8.26				5.78 - 10.74		
Silver	NR	5.42				3.79 - 7.05		
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	NR	2.85				2.00 - 3.71		
Uranium-235	NR	0.0317				0.0222 - 0.0412		
Uranium-238	NR	8.8				6.2 - 11.4		
Uranium-Total	NR	8.9				6.2 - 11.6		
Vanadium	NR	55.0				38.5 - 71.5		
Zinc	NR	70				49 - 91		

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	-0.98		A			False Positive Test	2.53	
Cesium-134	398.05	404	A		-1.5	283 - 525	6.34	N
Cesium-137	1473.033	1550	A		-5.0	1085 - 2015	32.63	A
Cobalt-57	357	401	A		-11.0	281 - 521	8.06	A
Cobalt-60	618	660	A		-6.4	462 - 858	12.33	N
Iron-55	NR	650				455 - 845		
Manganese-54	326.67	332	A		-1.6	232 - 432	7.17	A
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	61.12	34.7	N		76.1	24.3 - 45.1	6.32	A
Plutonium-239/240	6.82	0.37	N	(4)		Sensitivity Evaluation	1.15	
Potassium-40	464.33	485	A		-4.3	340 - 631	19.07	A
Strontium-90	398.95	440	A		-9.3	308 - 572	35.39	A

Radiological — Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	336				235 - 437		
Thorium-228	41.77	48.8	A		-14.4	34.2 - 63.4	12.12	W
Thorium-230	38.92	54	W		-27.9	38 - 70	11.68	N
Thorium-232	39.46	45.1	A		-12.5	31.6 - 58.6	10.57	W
Uranium-234	38.14	40.7	A		-6.3	28.5 - 52.9	9.51	W
Uranium-238	105.7	110	A		-3.9	77 - 143	27.2	W
Zinc-65	713.33	703	A		1.5	492 - 914	17.37	A

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
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(28) = Not Reporting Previously Reported Analyte

MAPEP Mixed Analyte Performance Evaluation Program

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

Laboratory Results For MAPEP-24-MaS50

(FDOH01) Florida Dept. of Health, Mobile Environmental Radiological Lab
2100 All Childrens Way
Orlando, FL 32818-5271

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	8.4				5.9 - 10.9		
Arsenic	NR	24.5				17.2 - 31.9		
Barium	NR	197				138 - 256		
Beryllium	NR	23.0				16.1 - 29.9		
Cadmium	NR	4.74				3.32 - 6.16		
Chromium	NR	11.7				8.2 - 15.2		
Cobalt	NR	29.1				20.4 - 37.8		
Copper	NR	46.3				32.4 - 60.2		
Lead	NR	23.6				16.5 - 30.7		
Mercury	NR	0.257				0.180 - 0.334		
Nickel	NR	33.3				23.3 - 43.3		
Selenium	NR	8.26				5.78 - 10.74		
Silver	NR	5.42				3.79 - 7.05		
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	NR	2.85				2.00 - 3.71		
Uranium-235	NR	0.0317				0.0222 - 0.0412		
Uranium-238	NR	8.8				6.2 - 11.4		
Uranium-Total	NR	8.9				6.2 - 11.6		
Vanadium	NR	55.0				38.5 - 71.5		
Zinc	NR	70				49 - 91		

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.08		A			False Positive Test	2.85	
Cesium-134	426.03	404	A		5.5	283 - 525	5.29	N
Cesium-137	1485.71	1550	A		-4.1	1085 - 2015	24.91	N
Cobalt-57	357.53	401	A		-10.8	281 - 521	5.28	N
Cobalt-60	639.79	660	A		-3.1	462 - 858	8.85	N
Iron-55	NR	650				455 - 845		
Manganese-54	327.42	332	A		-1.4	232 - 432	5.5	N
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	NR	34.7				24.3 - 45.1		
Plutonium-239/240	NR	0.37				Sensitivity Evaluation		
Potassium-40	501.65	485	A		3.4	340 - 631	11.39	A
Strontium-90	NR	440				308 - 572		

Radiological								Units: (Bq/kg)
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	336				235 - 437		
Thorium-228	NR	48.8				34.2 - 63.4		
Thorium-230	NR	54				38 - 70		
Thorium-232	NR	45.1				31.6 - 58.6		
Uranium-234	NR	40.7				28.5 - 52.9		
Uranium-238	115	110	A		4.5	77 - 143	11.25	A
Zinc-65	735.06	703	A		4.6	492 - 914	14.13	N

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

MAPEP Mixed Analyte Performance Evaluation Program
Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-24-MaS50
(GENE01) GEL Laboratories, LLC
2040 Savage Road
Charleston, SC 29407

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	4.74	8.4	N		-43.6	5.9 - 10.9	0.330	A
Arsenic	23.5	24.5	A		-4.1	17.2 - 31.9	1.58	A
Barium	185	197	A		-6.1	138 - 256	12.3	A
Beryllium	23.1	23.0	A		0.4	16.1 - 29.9	1.54	A
Cadmium	4.35	4.74	A		-8.2	3.32 - 6.16	0.291	A
Chromium	11.0	11.7	A		-6.0	8.2 - 15.2	0.733	A
Cobalt	26.5	29.1	A		-8.9	20.4 - 37.8	1.77	A
Copper	47.0	46.3	A		1.5	32.4 - 60.2	3.14	A
Lead	23.7	23.6	A		0.4	16.5 - 30.7	1.58	A
Mercury	0.254	0.257	A		-1.2	0.180 - 0.334	0.0171	A
Nickel	29.8	33.3	A		-10.5	23.3 - 43.3	1.99	A
Selenium	7.42	8.26	A		-10.2	5.78 - 10.74	0.509	A
Silver	4.76	5.42	A		-12.2	3.79 - 7.05	0.319	A
Technetium-99	0.000601	5.32E-04	A		13.0	3.72E-4 - 6.92E-4	2.23E-5	A
Thallium	1.79	2.85	N		-37.2	2.00 - 3.71	0.186	A
Uranium-235	0.0252	0.0317	W		-20.5	0.0222 - 0.0412	0.00145	A
Uranium-238	7.05	8.8	A		-19.9	6.2 - 11.4	0.408	A
Uranium-Total	7.0752	8.9	W		-20.5	6.2 - 11.6	0.408	A
Vanadium	52.8	55.0	A		-4.0	38.5 - 71.5	3.52	A
Zinc	65.6	70	A		-6.3	49 - 91	4.38	A

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	1.35		A			False Positive Test	0.838	
Cesium-134	371	404	A		-8.2	283 - 525	19.5	A
Cesium-137	1690	1550	A		9.0	1085 - 2015	84.9	A
Cobalt-57	474	401	A		18.2	281 - 521	17.7	A
Cobalt-60	665	660	A		0.8	462 - 858	30.7	A
Iron-55	921	650	N		41.7	455 - 845	199	W
Manganese-54	368	332	A		10.8	232 - 432	19.6	A
Nickel-63	1130	1530	W		-26.1	1071 - 1989	111	A
Plutonium-238	35.7	34.7	A		2.9	24.3 - 45.1	2.46	A
Plutonium-239/240	1.29	0.37	A	(17)		Sensitivity Evaluation	0.552	
Plutonium-241	NR			(28)				
Potassium-40	538	485	A		10.9	340 - 631	27.3	A

Radiological								Units: (Bq/kg)
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	352	440	A		-20.0	308 - 572	32.3	A
Technetium-99	283	336	A		-15.8	235 - 437	32.5	A
Thorium-228	47.8	48.8	A		-2.0	34.2 - 63.4	4.46	A
Thorium-230	48.0	54	A		-11.1	38 - 70	4.29	A
Thorium-232	42.9	45.1	A		-4.9	31.6 - 58.6	3.88	A
Uranium-234	36.8	40.7	A		-9.6	28.5 - 52.9	2.64	A
Uranium-238	107	110	A		-2.7	77 - 143	5.94	A
Zinc-65	799	703	A		13.7	492 - 914	35.5	A

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

Laboratory Results For MAPEP-24-MaS50
(GPCL01) Georgia Power Company Environmental Laboratory 2480
Maner Road
Atlanta, GA 30339

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	8.4				5.9 - 10.9		
Arsenic	NR	24.5				17.2 - 31.9		
Barium	NR	197				138 - 256		
Beryllium	NR	23.0				16.1 - 29.9		
Cadmium	NR	4.74				3.32 - 6.16		
Chromium	NR	11.7				8.2 - 15.2		
Cobalt	NR	29.1				20.4 - 37.8		
Copper	NR	46.3				32.4 - 60.2		
Lead	NR	23.6				16.5 - 30.7		
Mercury	NR	0.257				0.180 - 0.334		
Nickel	NR	33.3				23.3 - 43.3		
Selenium	NR	8.26				5.78 - 10.74		
Silver	NR	5.42				3.79 - 7.05		
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	NR	2.85				2.00 - 3.71		
Uranium-235	NR	0.0317				0.0222 - 0.0412		
Uranium-238	NR	8.8				6.2 - 11.4		
Uranium-Total	NR	8.9				6.2 - 11.6		
Vanadium	NR	55.0				38.5 - 71.5		
Zinc	NR	70				49 - 91		

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	405.9	404	A		0.5	283 - 525	26.28	A
Cesium-137	1533.85	1550	A		-1.0	1085 - 2015	110.65	A
Cobalt-57	379.29	401	A		-5.4	281 - 521	33.79	A
Cobalt-60	631.47	660	A		-4.3	462 - 858	43.87	A
Iron-55	NR	650				455 - 845		
Manganese-54	333.63	332	A		0.5	232 - 432	24.56	A
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	NR	34.7				24.3 - 45.1		
Plutonium-239/240	NR	0.37				Sensitivity Evaluation		
Potassium-40	516.18	485	A		6.4	340 - 631	42.63	A
Strontium-90	NR	440				308 - 572		

Radiological								Units: (Bq/kg)
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	336				235 - 437		
Thorium-228	NR	48.8				34.2 - 63.4		
Thorium-230	NR	54				38 - 70		
Thorium-232	NR	45.1				31.6 - 58.6		
Uranium-234	NR	40.7				28.5 - 52.9		
Uranium-238	NR	110				77 - 143		
Zinc-65	736.09	703	A		4.7	492 - 914	53.18	A

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

MAPEP Mixed Analyte Performance Evaluation Program

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

Laboratory Results For MAPEP-24-MaS50

(HECR01) SC Dept. Health and Environmental Control Radiological Laboratory
8231 Parklane Road
Columbia, SC 29223

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	8.4				5.9 - 10.9		
Arsenic	NR	24.5				17.2 - 31.9		
Barium	NR	197				138 - 256		
Beryllium	NR	23.0				16.1 - 29.9		
Cadmium	NR	4.74				3.32 - 6.16		
Chromium	NR	11.7				8.2 - 15.2		
Cobalt	NR	29.1				20.4 - 37.8		
Copper	NR	46.3				32.4 - 60.2		
Lead	NR	23.6				16.5 - 30.7		
Mercury	NR	0.257				0.180 - 0.334		
Nickel	NR	33.3				23.3 - 43.3		
Selenium	NR	8.26				5.78 - 10.74		
Silver	NR	5.42				3.79 - 7.05		
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	NR	2.85				2.00 - 3.71		
Uranium-235	NR	0.0317				0.0222 - 0.0412		
Uranium-238	NR	8.8				6.2 - 11.4		
Uranium-Total	NR	8.9				6.2 - 11.6		
Vanadium	NR	55.0				38.5 - 71.5		
Zinc	NR	70				49 - 91		

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	396.8	404	A		-1.8	283 - 525	16.52	A
Cesium-137	1591	1550	A		2.6	1085 - 2015	160.4	A
Cobalt-57	398.3	401	A		-0.7	281 - 521	22.76	A
Cobalt-60	667.4	660	A		1.1	462 - 858	39.02	A
Iron-55	NR	650				455 - 845		
Manganese-54	349.3	332	A		5.2	232 - 432	36.52	A
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	NR	34.7				24.3 - 45.1		
Plutonium-239/240	NR	0.37				Sensitivity Evaluation		
Potassium-40	539.9	485	A		11.3	340 - 631	47.20	A
Strontium-90	NR	440				308 - 572		

Radiological								Units: (Bq/kg)
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	336				235 - 437		
Thorium-228	NR	48.8				34.2 - 63.4		
Thorium-230	NR	54				38 - 70		
Thorium-232	NR	45.1				31.6 - 58.6		
Uranium-234	NR	40.7				28.5 - 52.9		
Uranium-238	NR	110				77 - 143		
Zinc-65	695.3	703	A		-1.1	492 - 914	51.72	A

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

MAPEP Mixed Analyte Performance Evaluation Program

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

Laboratory Results For MAPEP-24-MaS50
(HPAC99) UKHSA, RCE Glasgow
155 Hardgate Road
Glasgow, Scotland G51 4LS

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	8.4				5.9 - 10.9		
Arsenic	23.3	24.5	A		-4.9	17.2 - 31.9	1.5	A
Barium	209	197	A		6.1	138 - 256	21	A
Beryllium	23.9	23.0	A		3.9	16.1 - 29.9	2.3	A
Cadmium	4.76	4.74	A		0.4	3.32 - 6.16	.31	A
Chromium	14.8	11.7	W		26.5	8.2 - 15.2	1.9	A
Cobalt	29.7	29.1	A		2.1	20.4 - 37.8	1.6	A
Copper	48	46.3	A		3.7	32.4 - 60.2	3.6	A
Lead	24.3	23.6	A		3.0	16.5 - 30.7	1.6	A
Mercury	NR	0.257				0.180 - 0.334		
Nickel	33.8	33.3	A		1.5	23.3 - 43.3	2.5	A
Selenium	NR	8.26				5.78 - 10.74		
Silver	NR	5.42				3.79 - 7.05		
Technetium-99	.00051	5.32E-04	A		-4.1	3.72E-4 - 6.92E-4	.000059	A
Thallium	2.53	2.85	A		-11.2	2.00 - 3.71	.18	A
Uranium-235	NR	0.0317				0.0222 - 0.0412		
Uranium-238	NR	8.8				6.2 - 11.4		
Uranium-Total	6.55	8.9	W		-26.4	6.2 - 11.6	.66	A
Vanadium	55.3	55.0	A		0.5	38.5 - 71.5	5	A
Zinc	81	70	A		15.7	49 - 91	6.9	A

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	1.13		N	(1)		False Positive Test	.25	
Cesium-134	368	404	A		-8.9	283 - 525	17	A
Cesium-137	1429	1550	A		-7.8	1085 - 2015	66	A
Cobalt-57	344	401	A		-14.2	281 - 521	16	A
Cobalt-60	629	660	A		-4.7	462 - 858	29	A
Iron-55	NR	650				455 - 845		
Manganese-54	311	332	A		-6.3	232 - 432	14	A
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	32.8	34.7	A		-5.5	24.3 - 45.1	1.8	A
Plutonium-239/240	.59	0.37	A			Sensitivity Evaluation	.16	
Potassium-40	451	485	A		-7.0	340 - 631	22	A
Strontium-90	411	440	A		-6.6	308 - 572	24	A

Radiological — Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	319	336	A		-5.1	235 - 437	37	A
Thorium-228	201.3	48.8	N		312.5	34.2 - 63.4	9.5	A
Thorium-230	32.5	54	N		-39.8	38 - 70	2.2	A
Thorium-232	31.2	45.1	N		-30.8	31.6 - 58.6	2.2	A
Uranium-234	22.7	40.7	N		-44.2	28.5 - 52.9	1.4	A
Uranium-238	83.2	110	W		-24.4	77 - 143	3.7	A
Zinc-65	679	703	A		-3.4	492 - 914	31	A

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

MAPEP Mixed Analyte Performance Evaluation Program

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

Laboratory Results For MAPEP-24-MaS50

(HPAL01) Los Alamos National Laboratory
Josh Chandler, z338219 MS G761
Los Alamos, NM 87545-1663

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	8.4				5.9 - 10.9		
Arsenic	NR	24.5				17.2 - 31.9		
Barium	NR	197				138 - 256		
Beryllium	NR	23.0				16.1 - 29.9		
Cadmium	NR	4.74				3.32 - 6.16		
Chromium	NR	11.7				8.2 - 15.2		
Cobalt	NR	29.1				20.4 - 37.8		
Copper	NR	46.3				32.4 - 60.2		
Lead	NR	23.6				16.5 - 30.7		
Mercury	NR	0.257				0.180 - 0.334		
Nickel	NR	33.3				23.3 - 43.3		
Selenium	NR	8.26				5.78 - 10.74		
Silver	NR	5.42				3.79 - 7.05		
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	NR	2.85				2.00 - 3.71		
Uranium-235	NR	0.0317				0.0222 - 0.0412		
Uranium-238	NR	8.8				6.2 - 11.4		
Uranium-Total	NR	8.9				6.2 - 11.6		
Vanadium	NR	55.0				38.5 - 71.5		
Zinc	NR	70				49 - 91		

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	364.20	404	A		-9.9	283 - 525	13.85	A
Cesium-137	1558.00	1550	A		0.5	1085 - 2015	53.74	A
Cobalt-57	391.82	401	A		-2.3	281 - 521	21.51	A
Cobalt-60	629.98	660	A		-4.5	462 - 858	20.07	A
Iron-55	NR	650				455 - 845		
Manganese-54	342.69	332	A		3.2	232 - 432	13.75	A
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	NR	34.7				24.3 - 45.1		
Plutonium-239/240	NR	0.37				Sensitivity Evaluation		
Potassium-40	477.50	485	A		-1.5	340 - 631	35.58	A
Strontium-90	NR	440				308 - 572		

Radiological								Units: (Bq/kg)
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	336				235 - 437		
Thorium-228	NR	48.8				34.2 - 63.4		
Thorium-230	NR	54				38 - 70		
Thorium-232	NR	45.1				31.6 - 58.6		
Uranium-234	NR	40.7				28.5 - 52.9		
Uranium-238	118.44	110	A		7.7	77 - 143	17.73	A
Zinc-65	718.54	703	A		2.2	492 - 914	26.87	A

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

MAPEP Mixed Analyte Performance Evaluation Program
Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-24-MaS50
(IAEA20) IAEA Marine Environment Laboratories, Radiometrics Laboratory
4a, Quai Antoine 1er
Monaco, Monaco 98000

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	8.4				5.9 - 10.9		
Arsenic	NR	24.5				17.2 - 31.9		
Barium	NR	197				138 - 256		
Beryllium	NR	23.0				16.1 - 29.9		
Cadmium	NR	4.74				3.32 - 6.16		
Chromium	NR	11.7				8.2 - 15.2		
Cobalt	NR	29.1				20.4 - 37.8		
Copper	NR	46.3				32.4 - 60.2		
Lead	NR	23.6				16.5 - 30.7		
Mercury	NR	0.257				0.180 - 0.334		
Nickel	NR	33.3				23.3 - 43.3		
Selenium	NR	8.26				5.78 - 10.74		
Silver	NR	5.42				3.79 - 7.05		
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	NR	2.85				2.00 - 3.71		
Uranium-235	NR	0.0317				0.0222 - 0.0412		
Uranium-238	NR	8.8				6.2 - 11.4		
Uranium-Total	NR	8.9				6.2 - 11.6		
Vanadium	NR	55.0				38.5 - 71.5		
Zinc	NR	70				49 - 91		

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	337	404	A		-16.6	283 - 525	23	A
Cesium-137	1620	1550	A		4.5	1085 - 2015	110	A
Cobalt-57	410	401	A		2.2	281 - 521	41	A
Cobalt-60	583	660	A		-11.7	462 - 858	29	A
Iron-55	NR	650				455 - 845		
Manganese-54	333	332	A		0.3	232 - 432	22	A
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	NR	34.7				24.3 - 45.1		
Plutonium-239/240	NR	0.37				Sensitivity Evaluation		
Potassium-40	494	485	A		1.9	340 - 631	25	A
Strontium-90	NR	440				308 - 572		

Radiological								Units: (Bq/kg)
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	336				235 - 437		
Thorium-228	NR	48.8				34.2 - 63.4		
Thorium-230	NR	54				38 - 70		
Thorium-232	NR	45.1				31.6 - 58.6		
Uranium-234	NR	40.7				28.5 - 52.9		
Uranium-238	NR	110				77 - 143		
Zinc-65	731	703	A		4.0	492 - 914	38	A

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

MAPEP Mixed Analyte Performance Evaluation Program

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

Laboratory Results For MAPEP-24-MaS50
(IAEA99) International Atomic Energy Agency
Agency's Laboratories Seibersdorf
Seibersdorf, Austria A-2444

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	8.4				5.9 - 10.9		
Arsenic	NR	24.5				17.2 - 31.9		
Barium	NR	197				138 - 256		
Beryllium	NR	23.0				16.1 - 29.9		
Cadmium	NR	4.74				3.32 - 6.16		
Chromium	NR	11.7				8.2 - 15.2		
Cobalt	NR	29.1				20.4 - 37.8		
Copper	NR	46.3				32.4 - 60.2		
Lead	NR	23.6				16.5 - 30.7		
Mercury	NR	0.257				0.180 - 0.334		
Nickel	NR	33.3				23.3 - 43.3		
Selenium	NR	8.26				5.78 - 10.74		
Silver	NR	5.42				3.79 - 7.05		
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	NR	2.85				2.00 - 3.71		
Uranium-235	NR	0.0317				0.0222 - 0.0412		
Uranium-238	NR	8.8				6.2 - 11.4		
Uranium-Total	NR	8.9				6.2 - 11.6		
Vanadium	NR	55.0				38.5 - 71.5		
Zinc	NR	70				49 - 91		

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	-0.555		A			False Positive Test	1.075	
Cesium-134	393	404	A		-2.7	283 - 525	13	A
Cesium-137	1510	1550	A		-2.6	1085 - 2015	42	A
Cobalt-57	388	401	A		-3.2	281 - 521	10	A
Cobalt-60	644	660	A		-2.4	462 - 858	22	A
Iron-55	NR	650				455 - 845		
Manganese-54	324	332	A		-2.4	232 - 432	10	A
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	NR	34.7				24.3 - 45.1		
Plutonium-239/240	NR	0.37				Sensitivity Evaluation		
Potassium-40	467	485	A		-3.7	340 - 631	18	A
Strontium-90	NR	440				308 - 572		

Radiological								Units: (Bq/kg)
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	336				235 - 437		
Thorium-228	NR	48.8				34.2 - 63.4		
Thorium-230	NR	54				38 - 70		
Thorium-232	NR	45.1				31.6 - 58.6		
Uranium-234	NR	40.7				28.5 - 52.9		
Uranium-238	NR	110				77 - 143		
Zinc-65	697	703	A		-0.9	492 - 914	22	A

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

MAPEP Mixed Analyte Performance Evaluation Program
Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-24-MaS50
(IEMA01) Illinois Emergency Management Agency Radiochemistry Laboratory
1301 Knotts St.
Springfield, IL 62703

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	8.4				5.9 - 10.9		
Arsenic	NR	24.5				17.2 - 31.9		
Barium	NR	197				138 - 256		
Beryllium	NR	23.0				16.1 - 29.9		
Cadmium	NR	4.74				3.32 - 6.16		
Chromium	NR	11.7				8.2 - 15.2		
Cobalt	NR	29.1				20.4 - 37.8		
Copper	NR	46.3				32.4 - 60.2		
Lead	NR	23.6				16.5 - 30.7		
Mercury	NR	0.257				0.180 - 0.334		
Nickel	NR	33.3				23.3 - 43.3		
Selenium	NR	8.26				5.78 - 10.74		
Silver	NR	5.42				3.79 - 7.05		
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	NR	2.85				2.00 - 3.71		
Uranium-235	NR	0.0317				0.0222 - 0.0412		
Uranium-238	NR	8.8				6.2 - 11.4		
Uranium-Total	NR	8.9				6.2 - 11.6		
Vanadium	NR	55.0				38.5 - 71.5		
Zinc	NR	70				49 - 91		

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.439		A			False Positive Test	0.290	
Cesium-134	368.5	404	A		-8.8	283 - 525	2.8	N
Cesium-137	1610.0	1550	A		3.9	1085 - 2015	23.6	N
Cobalt-57	396.0	401	A		-1.2	281 - 521	5.3	N
Cobalt-60	686.5	660	A		4.0	462 - 858	6.5	N
Iron-55	NR	650				455 - 845		
Manganese-54	353.5	332	A		6.5	232 - 432	4.8	N
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	37.12	34.7	A		7.0	24.3 - 45.1	2.07	A
Plutonium-239/240	0.653	0.37	A	(17)		Sensitivity Evaluation	0.251	
Potassium-40	536.0	485	A		10.5	340 - 631	12.3	A
Strontium-90	376.2	440	A		-14.5	308 - 572	39	A

Radiological — Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	336				235 - 437		
Thorium-228	51.7	48.8	A		5.9	34.2 - 63.4	5.01	A
Thorium-230	NR	54	N	(28)		38 - 70		
Thorium-232	42.76	45.1	A		-5.2	31.6 - 58.6	4.31	A
Uranium-234	42.24	40.7	A		3.8	28.5 - 52.9	2.20	A
Uranium-238	108	110	A		-1.8	77 - 143	4.27	A
Zinc-65	794.5	703	A		13.0	492 - 914	10.6	N

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

MAPEP Mixed Analyte Performance Evaluation Program

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

Laboratory Results For MAPEP-24-MaS50

(ISUE01) ISU Environmental Monitoring Laboratory
785 5th 8th Ave Rm B107
Pocatello, Idaho 83209

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	8.4				5.9 - 10.9		
Arsenic	NR	24.5				17.2 - 31.9		
Barium	NR	197				138 - 256		
Beryllium	NR	23.0				16.1 - 29.9		
Cadmium	NR	4.74				3.32 - 6.16		
Chromium	NR	11.7				8.2 - 15.2		
Cobalt	NR	29.1				20.4 - 37.8		
Copper	NR	46.3				32.4 - 60.2		
Lead	NR	23.6				16.5 - 30.7		
Mercury	NR	0.257				0.180 - 0.334		
Nickel	NR	33.3				23.3 - 43.3		
Selenium	NR	8.26				5.78 - 10.74		
Silver	NR	5.42				3.79 - 7.05		
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	NR	2.85				2.00 - 3.71		
Uranium-235	NR	0.0317				0.0222 - 0.0412		
Uranium-238	NR	8.8				6.2 - 11.4		
Uranium-Total	NR	8.9				6.2 - 11.6		
Vanadium	NR	55.0				38.5 - 71.5		
Zinc	NR	70				49 - 91		

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	301.8	404	W		-25.3	283 - 525	8.50	A
Cesium-137	1287.1	1550	A		-17.0	1085 - 2015	33.3	A
Cobalt-57	301.7	401	W		-24.8	281 - 521	11.4	A
Cobalt-60	503.8	660	W		-23.7	462 - 858	13.9	A
Iron-55	NR	650				455 - 845		
Manganese-54	270.7	332	A		-18.5	232 - 432	6.60	A
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	NR	34.7				24.3 - 45.1		
Plutonium-239/240	NR	0.37				Sensitivity Evaluation		
Potassium-40	365.7	485	W		-24.6	340 - 631	13.4	A
Strontium-90	NR	440				308 - 572		

Radiological								Units: (Bq/kg)
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	336				235 - 437		
Thorium-228	NR	48.8				34.2 - 63.4		
Thorium-230	NR	54				38 - 70		
Thorium-232	NR	45.1				31.6 - 58.6		
Uranium-234	NR	40.7				28.5 - 52.9		
Uranium-238	NR	110				77 - 143		
Zinc-65	557.0	703	W		-20.8	492 - 914	14.1	A

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

MAPEP Mixed Analyte Performance Evaluation Program
Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-24-MaS50
(JLNN01) Jefferson Laboratory
111 Hadron Drive
Newport News, VA 23606

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	8.4				5.9 - 10.9		
Arsenic	NR	24.5				17.2 - 31.9		
Barium	NR	197				138 - 256		
Beryllium	NR	23.0				16.1 - 29.9		
Cadmium	NR	4.74				3.32 - 6.16		
Chromium	NR	11.7				8.2 - 15.2		
Cobalt	NR	29.1				20.4 - 37.8		
Copper	NR	46.3				32.4 - 60.2		
Lead	NR	23.6				16.5 - 30.7		
Mercury	NR	0.257				0.180 - 0.334		
Nickel	NR	33.3				23.3 - 43.3		
Selenium	NR	8.26				5.78 - 10.74		
Silver	NR	5.42				3.79 - 7.05		
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	NR	2.85				2.00 - 3.71		
Uranium-235	NR	0.0317				0.0222 - 0.0412		
Uranium-238	NR	8.8				6.2 - 11.4		
Uranium-Total	NR	8.9				6.2 - 11.6		
Vanadium	NR	55.0				38.5 - 71.5		
Zinc	NR	70				49 - 91		

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.1215		A			False Positive Test	0.636	
Cesium-134	376	404	A		-6.9	283 - 525	6.23	N
Cesium-137	1600	1550	A		3.2	1085 - 2015	25.2	N
Cobalt-57	425	401	A		6.0	281 - 521	8.66	A
Cobalt-60	677	660	A		2.6	462 - 858	8.91	N
Iron-55	NR	650				455 - 845		
Manganese-54	351.5	332	A		5.9	232 - 432	4.79	N
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	NR	34.7				24.3 - 45.1		
Plutonium-239/240	NR	0.37				Sensitivity Evaluation		
Potassium-40	464.5	485	A		-4.2	340 - 631	1.05	N
Strontium-90	NR	440				308 - 572		

Radiological								Units: (Bq/kg)
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	336				235 - 437		
Thorium-228	NR	48.8				34.2 - 63.4		
Thorium-230	NR	54				38 - 70		
Thorium-232	NR	45.1				31.6 - 58.6		
Uranium-234	NR	40.7				28.5 - 52.9		
Uranium-238	NR	110				77 - 143		
Zinc-65	773	703	A		10.0	492 - 914	10.2	N

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

MAPEP Mixed Analyte Performance Evaluation Program
Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-24-MaS50
(JNRC99) Energy and Mineral Regulatory Commission
Radiological laboratories directorate
Amman, Amman 11821

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	8.4				5.9 - 10.9		
Arsenic	NR	24.5				17.2 - 31.9		
Barium	NR	197				138 - 256		
Beryllium	NR	23.0				16.1 - 29.9		
Cadmium	NR	4.74				3.32 - 6.16		
Chromium	NR	11.7				8.2 - 15.2		
Cobalt	NR	29.1				20.4 - 37.8		
Copper	NR	46.3				32.4 - 60.2		
Lead	NR	23.6				16.5 - 30.7		
Mercury	NR	0.257				0.180 - 0.334		
Nickel	NR	33.3				23.3 - 43.3		
Selenium	NR	8.26				5.78 - 10.74		
Silver	NR	5.42				3.79 - 7.05		
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	NR	2.85				2.00 - 3.71		
Uranium-235	NR	0.0317				0.0222 - 0.0412		
Uranium-238	NR	8.8				6.2 - 11.4		
Uranium-Total	NR	8.9				6.2 - 11.6		
Vanadium	NR	55.0				38.5 - 71.5		
Zinc	NR	70				49 - 91		

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	397	404	A		-1.7	283 - 525	2	N
Cesium-137	1590	1550	A		2.6	1085 - 2015	8	N
Cobalt-57	459	401	A		14.5	281 - 521	2	N
Cobalt-60	700	660	A		6.1	462 - 858	4	N
Iron-55	NR	650				455 - 845		
Manganese-54	352	332	A		6.0	232 - 432	2	N
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	NR	34.7				24.3 - 45.1		
Plutonium-239/240	NR	0.37				Sensitivity Evaluation		
Potassium-40	544	485	A		12.2	340 - 631	12	A
Strontium-90	NR	440				308 - 572		

Radiological								Units: (Bq/kg)
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	336				235 - 437		
Thorium-228	NR	48.8				34.2 - 63.4		
Thorium-230	NR	54				38 - 70		
Thorium-232	48	45.1	A		6.4	31.6 - 58.6	4	A
Uranium-234	NR	40.7				28.5 - 52.9		
Uranium-238	92	110	A		-16.4	77 - 143	5	A
Zinc-65	845	703	W		20.2	492 - 914	6	N

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

Laboratory Results For MAPEP-24-MaS50
(LOCK03) Advanced Test Reactor (ATR) Complex Radioanalytical Laboratory
INL/Battelle Energy Alliance, LLC
Idaho Falls, ID 83415-7111

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	8.4				5.9 - 10.9		
Arsenic	NR	24.5				17.2 - 31.9		
Barium	NR	197				138 - 256		
Beryllium	NR	23.0				16.1 - 29.9		
Cadmium	NR	4.74				3.32 - 6.16		
Chromium	NR	11.7				8.2 - 15.2		
Cobalt	NR	29.1				20.4 - 37.8		
Copper	NR	46.3				32.4 - 60.2		
Lead	NR	23.6				16.5 - 30.7		
Mercury	NR	0.257				0.180 - 0.334		
Nickel	NR	33.3				23.3 - 43.3		
Selenium	NR	8.26				5.78 - 10.74		
Silver	NR	5.42				3.79 - 7.05		
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	NR	2.85				2.00 - 3.71		
Uranium-235	NR	0.0317				0.0222 - 0.0412		
Uranium-238	NR	8.8				6.2 - 11.4		
Uranium-Total	NR	8.9				6.2 - 11.6		
Vanadium	NR	55.0				38.5 - 71.5		
Zinc	NR	70				49 - 91		

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	454.67	404	A		12.5	283 - 525	8.85	N
Cesium-137	1846.67	1550	A		19.1	1085 - 2015	35.15	N
Cobalt-57	520.67	401	W		29.8	281 - 521	12.43	A
Cobalt-60	768.67	660	A		16.5	462 - 858	14.88	N
Iron-55	NR	650				455 - 845		
Manganese-54	403.33	332	W		21.5	232 - 432	8.35	A
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	NR	34.7				24.3 - 45.1		
Plutonium-239/240	NR	0.37				Sensitivity Evaluation		
Potassium-40	538	485	A		10.9	340 - 631	18.33	A
Strontium-90	NR	440				308 - 572		

Radiological								Units: (Bq/kg)
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	336				235 - 437		
Thorium-228	NR	48.8				34.2 - 63.4		
Thorium-230	NR	54				38 - 70		
Thorium-232	NR	45.1				31.6 - 58.6		
Uranium-234	NR	40.7				28.5 - 52.9		
Uranium-238	NR	110				77 - 143		
Zinc-65	869.67	703	W		23.7	492 - 914	17.65	A

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

Laboratory Results For MAPEP-24-MaS50
(MART01) Fluor-BWXT Portsmouth LLC, Analytical Laboratory
COC, Bldg. X-705, Rm 106
Piketon, OH 45661

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	8.4				5.9 - 10.9		
Arsenic	NR	24.5				17.2 - 31.9		
Barium	NR	197				138 - 256		
Beryllium	NR	23.0				16.1 - 29.9		
Cadmium	NR	4.74				3.32 - 6.16		
Chromium	NR	11.7				8.2 - 15.2		
Cobalt	NR	29.1				20.4 - 37.8		
Copper	NR	46.3				32.4 - 60.2		
Lead	NR	23.6				16.5 - 30.7		
Mercury	NR	0.257				0.180 - 0.334		
Nickel	NR	33.3				23.3 - 43.3		
Selenium	NR	8.26				5.78 - 10.74		
Silver	NR	5.42				3.79 - 7.05		
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	NR	2.85				2.00 - 3.71		
Uranium-235	0.0301	0.0317	A		-5.0	0.0222 - 0.0412	0.00206	A
Uranium-238	8.69	8.8	A		-1.3	6.2 - 11.4	0.898	A
Uranium-Total	8.72	8.9	A		-2.0	6.2 - 11.6	0.492	A
Vanadium	NR	55.0				38.5 - 71.5		
Zinc	NR	70				49 - 91		

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.2046		A			False Positive Test	0.2293	
Cesium-134	NR	404				283 - 525		
Cesium-137	NR	1550				1085 - 2015		
Cobalt-57	NR	401				281 - 521		
Cobalt-60	NR	660				462 - 858		
Iron-55	NR	650				455 - 845		
Manganese-54	NR	332				232 - 432		
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	31.86	34.7	A		-8.2	24.3 - 45.1	2.261	A
Plutonium-239/240	0.3391	0.37	A	(17)		Sensitivity Evaluation	0.2376	
Potassium-40	NR	485				340 - 631		
Strontium-90	NR	440				308 - 572		

Radiological								Units: (Bq/kg)
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	323	336	A		-3.9	235 - 437	6.81	A
Thorium-228	53.37	48.8	A		9.4	34.2 - 63.4	1.624	A
Thorium-230	49.73	54	A		-7.9	38 - 70	1.539	A
Thorium-232	44.46	45.1	A		-1.4	31.6 - 58.6	1.405	A
Uranium-234	37.39	40.7	A		-8.1	28.5 - 52.9	2.684	A
Uranium-238	96.71	110	A		-12.1	77 - 143	5.807	A
Zinc-65	NR	703				492 - 914		

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

MAPEP Mixed Analyte Performance Evaluation Program
Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-24-MaS50
(MART03) Radioactive Material Analysis Laboratory
ORNL
Oak Ridge, TN 37830

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	9.06	8.4	A		7.9	5.9 - 10.9	0.91	A
Arsenic	24.8	24.5	A		1.2	17.2 - 31.9	2.48	A
Barium	210	197	A		6.6	138 - 256	21.0	A
Beryllium	25.4	23.0	A		10.4	16.1 - 29.9	2.54	A
Cadmium	4.98	4.74	A		5.1	3.32 - 6.16	0.50	A
Chromium	15.6	11.7	N		33.3	8.2 - 15.2	1.56	A
Cobalt	31.2	29.1	A		7.2	20.4 - 37.8	3.12	A
Copper	53.0	46.3	A		14.5	32.4 - 60.2	5.30	A
Lead	26.6	23.6	A		12.7	16.5 - 30.7	2.66	A
Mercury	0.389	0.257	N		51.4	0.180 - 0.334	0.0778	W
Nickel	35.9	33.3	A		7.8	23.3 - 43.3	3.59	A
Selenium	8.49	8.26	A		2.8	5.78 - 10.74	0.85	A
Silver	5.59	5.42	A		3.1	3.79 - 7.05	0.56	A
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	2.95	2.85	A		3.5	2.00 - 3.71	0.30	A
Uranium-235	0.0183	0.0317	N		-42.3	0.0222 - 0.0412	0.00183	A
Uranium-238	6.92	8.8	W		-21.4	6.2 - 11.4	0.69	A
Uranium-Total	6.94	8.9	W		-22.0	6.2 - 11.6	0.69	A
Vanadium	60.0	55.0	A		9.1	38.5 - 71.5	6.00	A
Zinc	89.0	70	W		27.1	49 - 91	8.90	A

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	390.6	404	A		-3.3	283 - 525	3.7	N
Cesium-137	1545	1550	A		-0.3	1085 - 2015	22	N
Cobalt-57	406.3	401	A		1.3	281 - 521	4.8	N
Cobalt-60	672.3	660	A		1.9	462 - 858	7.9	N
Iron-55	NR	650				455 - 845		
Manganese-54	311.4	332	A		-6.2	232 - 432	4.8	N
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	NR	34.7				24.3 - 45.1		
Plutonium-239/240	NR	0.37				Sensitivity Evaluation		
Potassium-40	459	485	A		-5.4	340 - 631	13	A
Strontium-90	NR	440				308 - 572		

Radiological — Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	336				235 - 437		
Thorium-228	NR	48.8				34.2 - 63.4		
Thorium-230	NR	54				38 - 70		
Thorium-232	NR	45.1				31.6 - 58.6		
Uranium-234	NR	40.7				28.5 - 52.9		
Uranium-238	NR	110				77 - 143		
Zinc-65	660	703	A		-6.1	492 - 914	11	N

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

MAPEP Mixed Analyte Performance Evaluation Program
Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-24-MaS50
(MDPH01) MDPH-Radiation Control Program
MERL-Room 0066
Jamaica Plain, MA 02130-3597

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	8.4				5.9 - 10.9		
Arsenic	NR	24.5				17.2 - 31.9		
Barium	NR	197				138 - 256		
Beryllium	NR	23.0				16.1 - 29.9		
Cadmium	NR	4.74				3.32 - 6.16		
Chromium	NR	11.7				8.2 - 15.2		
Cobalt	NR	29.1				20.4 - 37.8		
Copper	NR	46.3				32.4 - 60.2		
Lead	NR	23.6				16.5 - 30.7		
Mercury	NR	0.257				0.180 - 0.334		
Nickel	NR	33.3				23.3 - 43.3		
Selenium	NR	8.26				5.78 - 10.74		
Silver	NR	5.42				3.79 - 7.05		
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	NR	2.85				2.00 - 3.71		
Uranium-235	NR	0.0317				0.0222 - 0.0412		
Uranium-238	NR	8.8				6.2 - 11.4		
Uranium-Total	NR	8.9				6.2 - 11.6		
Vanadium	NR	55.0				38.5 - 71.5		
Zinc	NR	70				49 - 91		

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	373.95	404	A		-7.4	283 - 525	9.27	A
Cesium-137	1514.53	1550	A		-2.3	1085 - 2015	37.74	A
Cobalt-57	393.43	401	A		-1.9	281 - 521	14.94	A
Cobalt-60	657.37	660	A		-0.4	462 - 858	18.59	A
Iron-55	NR	650				455 - 845		
Manganese-54	331.52	332	A		-0.1	232 - 432	8.28	A
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	NR	34.7				24.3 - 45.1		
Plutonium-239/240	NR	0.37				Sensitivity Evaluation		
Potassium-40	NR	485	N	(25)		340 - 631		
Strontium-90	NR	440				308 - 572		

Radiological								Units: (Bq/kg)
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	336				235 - 437		
Thorium-228	NR	48.8				34.2 - 63.4		
Thorium-230	NR	54				38 - 70		
Thorium-232	NR	45.1				31.6 - 58.6		
Uranium-234	NR	40.7				28.5 - 52.9		
Uranium-238	NR	110				77 - 143		
Zinc-65	723.97	703	A		3.0	492 - 914	17.48	A

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

Laboratory Results For MAPEP-24-MaS50
(NARL01) National Analytical Radiation Environmental Laboratory
540 S. Morris Ave.
Montgomery, AL 36115-2601

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	8.4				5.9 - 10.9		
Arsenic	NR	24.5				17.2 - 31.9		
Barium	NR	197				138 - 256		
Beryllium	NR	23.0				16.1 - 29.9		
Cadmium	NR	4.74				3.32 - 6.16		
Chromium	NR	11.7				8.2 - 15.2		
Cobalt	NR	29.1				20.4 - 37.8		
Copper	NR	46.3				32.4 - 60.2		
Lead	NR	23.6				16.5 - 30.7		
Mercury	NR	0.257				0.180 - 0.334		
Nickel	NR	33.3				23.3 - 43.3		
Selenium	NR	8.26				5.78 - 10.74		
Silver	NR	5.42				3.79 - 7.05		
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	NR	2.85				2.00 - 3.71		
Uranium-235	NR	0.0317				0.0222 - 0.0412		
Uranium-238	NR	8.8				6.2 - 11.4		
Uranium-Total	NR	8.9				6.2 - 11.6		
Vanadium	NR	55.0				38.5 - 71.5		
Zinc	NR	70				49 - 91		

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.259		A			False Positive Test	0.176	
Cesium-134	396	404	A		-2.0	283 - 525	21.3	A
Cesium-137	1560	1550	A		0.6	1085 - 2015	83.8	A
Cobalt-57	394	401	A		-1.7	281 - 521	21.3	A
Cobalt-60	643	660	A		-2.6	462 - 858	34.0	A
Iron-55	NR	650				455 - 845		
Manganese-54	342.0	332	A		3.0	232 - 432	18.4	A
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	34.5	34.7	A		-0.6	24.3 - 45.1	2.23	A
Plutonium-239/240	0.475	0.37	A	(17)		Sensitivity Evaluation	0.246	
Potassium-40	517	485	A		6.6	340 - 631	28.6	A
Strontium-90	NR	440				308 - 572		

Radiological								Units: (Bq/kg)
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	336				235 - 437		
Thorium-228	46.3	48.8	A		-5.1	34.2 - 63.4	3.22	A
Thorium-230	50.0	54	A		-7.4	38 - 70	3.47	A
Thorium-232	38.8	45.1	A		-14.0	31.6 - 58.6	2.82	A
Uranium-234	44.7	40.7	A		9.8	28.5 - 52.9	3.33	A
Uranium-238	110.0	110	A		0.0	77 - 143	6.74	A
Zinc-65	795.0	703	A		13.1	492 - 914	42.7	A

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

MAPEP Mixed Analyte Performance Evaluation Program
Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-24-MaS50
(NESI01) BWXT-Radioisotope & Analytical Chemistry Laboratory
Lynchburg Technology Center
Lynchburg, VA 24504-5447

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	8.87	8.4	A		5.6	5.9 - 10.9	0.161	N
Arsenic	21.6	24.5	A		-11.8	17.2 - 31.9	0.70	A
Barium	214	197	A		8.6	138 - 256	2.16	N
Beryllium	19.6	23.0	A		-14.8	16.1 - 29.9	0.53	A
Cadmium	4.66	4.74	A		-1.7	3.32 - 6.16	0.13	A
Chromium	13.1	11.7	A		12.0	8.2 - 15.2	2.05	W
Cobalt	26.6	29.1	A		-8.6	20.4 - 37.8	2.70	A
Copper	42.1	46.3	A		-9.1	32.4 - 60.2	2.45	A
Lead	25.2	23.6	A		6.8	16.5 - 30.7	2.04	A
Mercury	0.278	0.257	A		8.2	0.180 - 0.334	0.020	A
Nickel	36.2	33.3	A		8.7	23.3 - 43.3	0.87	A
Selenium	8.04	8.26	A		-2.7	5.78 - 10.74	0.268	A
Silver	5.17	5.42	A		-4.6	3.79 - 7.05	1.49	W
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	2.58	2.85	A		-9.5	2.00 - 3.71	1.52	N
Uranium-235	NR	0.0317				0.0222 - 0.0412		
Uranium-238	NR	8.8				6.2 - 11.4		
Uranium-Total	NR	8.9				6.2 - 11.6		
Vanadium	54.6	55.0	A		-0.7	38.5 - 71.5	1.72	A
Zinc	66.8	70	A		-4.6	49 - 91	1.90	A

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	2.34		A			False Positive Test	2.60	
Cesium-134	371	404	A		-8.2	283 - 525	17.0	A
Cesium-137	1593	1550	A		2.8	1085 - 2015	66.3	A
Cobalt-57	411	401	A		2.5	281 - 521	16.1	A
Cobalt-60	690	660	A		4.5	462 - 858	29.3	A
Iron-55	933	650	N		43.5	455 - 845	195	W
Manganese-54	351	332	A		5.7	232 - 432	15.2	A
Nickel-63	1687	1530	A		10.3	1071 - 1989	166	A
Plutonium-238	29.9	34.7	A		-13.8	24.3 - 45.1	6.83	W
Plutonium-239/240	1.35	0.37	A	(17)		Sensitivity Evaluation	1.44	
Potassium-40	511	485	A		5.4	340 - 631	28.6	A
Strontium-90	289	440	N		-34.3	308 - 572	24.5	A

Radiological								Units: (Bq/kg)
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	348	336	A		3.6	235 - 437	45.8	A
Thorium-228	NR	48.8				34.2 - 63.4		
Thorium-230	NR	54				38 - 70		
Thorium-232	NR	45.1				31.6 - 58.6		
Uranium-234	43.3	40.7	A		6.4	28.5 - 52.9	4.63	A
Uranium-238	107	110	A		-2.7	77 - 143	7.71	A
Zinc-65	771	703	A		9.7	492 - 914	31.9	A

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

Laboratory Results For MAPEP-24-MaS50
(NJDH01) New Jersey Dept. of Health, ECLS
3 Schwarzkopf Drive
Ewing, NJ 08628

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	8.4				5.9 - 10.9		
Arsenic	NR	24.5				17.2 - 31.9		
Barium	NR	197				138 - 256		
Beryllium	NR	23.0				16.1 - 29.9		
Cadmium	NR	4.74				3.32 - 6.16		
Chromium	NR	11.7				8.2 - 15.2		
Cobalt	NR	29.1				20.4 - 37.8		
Copper	NR	46.3				32.4 - 60.2		
Lead	NR	23.6				16.5 - 30.7		
Mercury	NR	0.257				0.180 - 0.334		
Nickel	NR	33.3				23.3 - 43.3		
Selenium	NR	8.26				5.78 - 10.74		
Silver	NR	5.42				3.79 - 7.05		
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	NR	2.85				2.00 - 3.71		
Uranium-235	NR	0.0317				0.0222 - 0.0412		
Uranium-238	NR	8.8				6.2 - 11.4		
Uranium-Total	NR	8.9				6.2 - 11.6		
Vanadium	NR	55.0				38.5 - 71.5		
Zinc	NR	70				49 - 91		

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	410	404	A		1.5	283 - 525	25.1	A
Cesium-137	1630	1550	A		5.2	1085 - 2015	98.6	A
Cobalt-57	410	401	A		2.2	281 - 521	41.3	A
Cobalt-60	688	660	A		4.2	462 - 858	28.4	A
Iron-55	NR	650				455 - 845		
Manganese-54	339	332	A		2.1	232 - 432	21.1	A
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	NR	34.7				24.3 - 45.1		
Plutonium-239/240	NR	0.37				Sensitivity Evaluation		
Potassium-40	481	485	A		-0.8	340 - 631	27.5	A
Strontium-90	NR	440				308 - 572		

Radiological								Units: (Bq/kg)
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	336				235 - 437		
Thorium-228	NR	48.8				34.2 - 63.4		
Thorium-230	NR	54				38 - 70		
Thorium-232	NR	45.1				31.6 - 58.6		
Uranium-234	NR	40.7				28.5 - 52.9		
Uranium-238	NR	110				77 - 143		
Zinc-65	741	703	A		5.4	492 - 914	32.2	A

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

MAPEP Mixed Analyte Performance Evaluation Program
Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-24-MaS50
(NOCS99) National Oceanography Centre, Southampton
GAU-Radioanalytical
Southampton, Hampshire SO14 3ZH

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	7.50	9.87	W	(5)	-24.0	6.9 - 12.8	0.50	A
Arsenic	23	24.5	A	(5)	-6.1	17.2 - 31.9	2	A
Barium	600	583	A	(5)	2.9	408 - 758	50	A
Beryllium	24	23.3	A	(5)	3.0	16.3 - 30.3	3	A
Cadmium	4.2	4.77	A	(5)	-12.0	3.34 - 6.20	0.4	A
Chromium	30	29.5	A	(5)	1.7	20.7 - 38.4	3	A
Cobalt	28	30.5	A	(5)	-8.2	21.4 - 39.7	3	A
Copper	49	53.2	A	(5)	-7.9	37.2 - 69.2	5	A
Lead	26	27.6	A	(5)	-5.8	19.3 - 35.9	3	A
Mercury	0.260	0.257	A	(5)	1.2	0.180 - 0.334	0.004	N
Nickel	33	35.4	A	(5)	-6.8	24.8 - 46.0	3	A
Selenium	6.0	8.34	W	(5)	-28.1	5.84 - 10.84	0.5	A
Silver	4.8	5.6	A	(5)	-14.3	3.92 - 7.28	0.5	A
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	2.9	3.18	A	(5)	-8.8	2.23 - 4.13	0.3	A
Uranium-235	0.032	0.0317	A		0.9	0.0222 - 0.0412	0.003	A
Uranium-238	9	8.8	A		2.3	6.2 - 11.4	1	A
Uranium-Total	9	8.9	A		1.1	6.2 - 11.6	1	A
Vanadium	90	83	A	(5)	8.4	58.1 - 107.9	10	A
Zinc	130	98	N	(5)	32.7	69 - 127	20	W

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	1.1		N	(1)		False Positive Test	0.2	
Cesium-134	440	404	A		8.9	283 - 525	10	A
Cesium-137	1600	1550	A		3.2	1085 - 2015	40	A
Cobalt-57	410	401	A		2.2	281 - 521	10	A
Cobalt-60	690	660	A		4.5	462 - 858	20	A
Iron-55	720	650	A		10.8	455 - 845	40	A
Manganese-54	338	332	A		1.8	232 - 432	9	A
Nickel-63	1450	1530	A		-5.2	1071 - 1989	70	A
Plutonium-238	34	34.7	A		-2.0	24.3 - 45.1	2	A
Plutonium-239/240	0.8	0.37	A			Sensitivity Evaluation	0.2	
Plutonium-241	32						320	N
Potassium-40	430	485	A		-11.3	340 - 631	20	A

Radiological — Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	300	440	N		-31.8	308 - 572	20	A
Technetium-99	330	336	A		-1.8	235 - 437	20	A
Thorium-228	55	48.8	A		12.7	34.2 - 63.4	4	A
Thorium-230	48	54	A		-11.1	38 - 70	3	A
Thorium-232	41	45.1	A		-9.1	31.6 - 58.6	3	A
Uranium-234	39	40.7	A		-4.2	28.5 - 52.9	3	A
Uranium-238	100	110	A		-9.1	77 - 143	5	A
Zinc-65	680	703	A		-3.3	492 - 914	20	A

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

MAPEP Mixed Analyte Performance Evaluation Program

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

Laboratory Results For MAPEP-24-MaS50
(ODHL01) Ohio Department of Health Laboratory
8995 E Main Street
Reynoldsburg, OH 43068

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	8.4				5.9 - 10.9		
Arsenic	NR	24.5				17.2 - 31.9		
Barium	NR	197				138 - 256		
Beryllium	NR	23.0				16.1 - 29.9		
Cadmium	NR	4.74				3.32 - 6.16		
Chromium	NR	11.7				8.2 - 15.2		
Cobalt	NR	29.1				20.4 - 37.8		
Copper	NR	46.3				32.4 - 60.2		
Lead	NR	23.6				16.5 - 30.7		
Mercury	NR	0.257				0.180 - 0.334		
Nickel	NR	33.3				23.3 - 43.3		
Selenium	NR	8.26				5.78 - 10.74		
Silver	NR	5.42				3.79 - 7.05		
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	NR	2.85				2.00 - 3.71		
Uranium-235	NR	0.0317				0.0222 - 0.0412		
Uranium-238	NR	8.8				6.2 - 11.4		
Uranium-Total	NR	8.9				6.2 - 11.6		
Vanadium	NR	55.0				38.5 - 71.5		
Zinc	NR	70				49 - 91		

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	428	404	A		5.9	283 - 525	12.4	A
Cesium-137	1620	1550	A		4.5	1085 - 2015	97	A
Cobalt-57	449	401	A		12.0	281 - 521	30.9	A
Cobalt-60	677	660	A		2.6	462 - 858	19.3	A
Iron-55	NR	650				455 - 845		
Manganese-54	344	332	A		3.6	232 - 432	20.7	A
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	NR	34.7				24.3 - 45.1		
Plutonium-239/240	NR	0.37				Sensitivity Evaluation		
Potassium-40	467	485	A		-3.7	340 - 631	21.1	A
Strontium-90	NR	440				308 - 572		

Radiological								Units: (Bq/kg)
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	336				235 - 437		
Thorium-228	NR	48.8				34.2 - 63.4		
Thorium-230	NR	54				38 - 70		
Thorium-232	NR	45.1				31.6 - 58.6		
Uranium-234	NR	40.7				28.5 - 52.9		
Uranium-238	NR	110				77 - 143		
Zinc-65	725	703	A		3.1	492 - 914	31.6	A

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

MAPEP Mixed Analyte Performance Evaluation Program
Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-24-MaS50
(OTLI01) Pace Analytical National Center for Testing & Innovation
12065 Lebanon Road
Mt. Juliet, TN 37122

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	2.73	8.4	N		-67.5	5.9 - 10.9	3	N
Arsenic	23.3	24.5	A		-4.9	17.2 - 31.9	1	A
Barium	191	197	A		-3.0	138 - 256	2.5	N
Beryllium	19.4	23.0	A		-15.7	16.1 - 29.9	2.5	A
Cadmium	5.22	4.74	A		10.1	3.32 - 6.16	1	W
Chromium	14	11.7	A		19.7	8.2 - 15.2	5	N
Cobalt	29.5	29.1	A		1.4	20.4 - 37.8	1	A
Copper	48.1	46.3	A		3.9	32.4 - 60.2	5	A
Lead	26.5	23.6	A		12.3	16.5 - 30.7	2	A
Mercury	0.205	0.257	W		-20.2	0.180 - 0.334	0.04	W
Nickel	35.3	33.3	A		6.0	23.3 - 43.3	2.5	A
Selenium	8.48	8.26	A		2.7	5.78 - 10.74	2.5	W
Silver	5.48	5.42	A		1.1	3.79 - 7.05	0.5	A
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	2.96	2.85	A		3.9	2.00 - 3.71	2	N
Uranium-235	.024	0.0317	W		-24.3	0.0222 - 0.0412	.001	A
Uranium-238	7.34	8.8	A		-16.6	6.2 - 11.4	0.1	N
Uranium-Total	6.45	8.9	W		-27.5	6.2 - 11.6	0.192	A
Vanadium	52.8	55.0	A		-4.0	38.5 - 71.5	2.5	A
Zinc	80.4	70	A		14.9	49 - 91	25	N

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.58		A			False Positive Test	2.83	
Cesium-134	360	404	A		-10.9	283 - 525	22.5	A
Cesium-137	1580	1550	A		1.9	1085 - 2015	97.8	A
Cobalt-57	385	401	A		-4.0	281 - 521	23.7	A
Cobalt-60	657	660	A		-0.5	462 - 858	40.3	A
Iron-55	NR	650				455 - 845		
Manganese-54	344	332	A		3.6	232 - 432	22.1	A
Nickel-63	NR	1530	N	(28)		1071 - 1989		
Plutonium-238	29.4	34.7	A		-15.3	24.3 - 45.1	6.54	W
Plutonium-239/240	0.66	0.37	A	(17)		Sensitivity Evaluation	1.5	
Potassium-40	500	485	A		3.1	340 - 631	42.5	A
Strontium-90	382	440	A		-13.2	308 - 572	9.1	A

Radiological — Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	213	336	N		-36.6	235 - 437	22	A
Thorium-228	NR	48.8				34.2 - 63.4		
Thorium-230	NR	54				38 - 70		
Thorium-232	NR	45.1				31.6 - 58.6		
Uranium-234	36.3	40.7	A		-10.8	28.5 - 52.9	7.8	W
Uranium-238	116	110	A		5.5	77 - 143	14.0	A
Zinc-65	774	703	A		10.1	492 - 914	50.1	A

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

Laboratory Results For MAPEP-24-MaS50
(RJLG01) RJ Lee Group - Columbia Basin Analytical Laboratories (CBAL)
2710 North 20th Avenue
Pasco, WA 99301

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	8.08	8.4	A		-3.8	5.9 - 10.9	1.08	A
Arsenic	22.6	24.5	A		-7.8	17.2 - 31.9	2.30	A
Barium	201	197	A		2.0	138 - 256	15.8	A
Beryllium	23.7	23.0	A		3.0	16.1 - 29.9	2.90	A
Cadmium	4.87	4.74	A		2.7	3.32 - 6.16	0.358	A
Chromium	14.1	11.7	W		20.5	8.2 - 15.2	1.45	A
Cobalt	28.6	29.1	A		-1.7	20.4 - 37.8	3.06	A
Copper	43.5	46.3	A		-6.0	32.4 - 60.2	4.65	A
Lead	24.5	23.6	A		3.8	16.5 - 30.7	2.23	A
Mercury	0.261	0.257	A		1.6	0.180 - 0.334	0.030	A
Nickel	33.2	33.3	A		-0.3	23.3 - 43.3	3.01	A
Selenium	8.05	8.26	A		-2.5	5.78 - 10.74	0.702	A
Silver	5.27	5.42	A		-2.8	3.79 - 7.05	0.554	A
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	2.62	2.85	A		-8.1	2.00 - 3.71	0.216	A
Uranium-235	NR	0.0317				0.0222 - 0.0412		
Uranium-238	NR	8.8				6.2 - 11.4		
Uranium-Total	7.40	8.9	A		-16.9	6.2 - 11.6	0.763	A
Vanadium	52.6	55.0	A		-4.4	38.5 - 71.5	6.96	A
Zinc	88.4	70	W		26.3	49 - 91	12.8	A

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	NR	404				283 - 525		
Cesium-137	NR	1550				1085 - 2015		
Cobalt-57	NR	401				281 - 521		
Cobalt-60	NR	660				462 - 858		
Iron-55	NR	650				455 - 845		
Manganese-54	NR	332				232 - 432		
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	NR	34.7				24.3 - 45.1		
Plutonium-239/240	NR	0.37				Sensitivity Evaluation		
Potassium-40	NR	485				340 - 631		
Strontium-90	NR	440				308 - 572		

Radiological								Units: (Bq/kg)
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	336				235 - 437		
Thorium-228	NR	48.8				34.2 - 63.4		
Thorium-230	NR	54				38 - 70		
Thorium-232	NR	45.1				31.6 - 58.6		
Uranium-234	NR	40.7				28.5 - 52.9		
Uranium-238	NR	110				77 - 143		
Zinc-65	NR	703				492 - 914		

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

Laboratory Results For MAPEP-24-MaS50
(SANC99) RadioAnalysis, South Africa Nuclear Energy Corp.
Sample Receipt Gate 1
Pretoria, Gauteng 0001

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	8.4				5.9 - 10.9		
Arsenic	NR	24.5				17.2 - 31.9		
Barium	NR	197				138 - 256		
Beryllium	NR	23.0				16.1 - 29.9		
Cadmium	NR	4.74				3.32 - 6.16		
Chromium	NR	11.7				8.2 - 15.2		
Cobalt	NR	29.1				20.4 - 37.8		
Copper	NR	46.3				32.4 - 60.2		
Lead	NR	23.6				16.5 - 30.7		
Mercury	NR	0.257				0.180 - 0.334		
Nickel	NR	33.3				23.3 - 43.3		
Selenium	NR	8.26				5.78 - 10.74		
Silver	NR	5.42				3.79 - 7.05		
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	NR	2.85				2.00 - 3.71		
Uranium-235	NR	0.0317				0.0222 - 0.0412		
Uranium-238	NR	8.8				6.2 - 11.4		
Uranium-Total	9.53	8.9	A		7.1	6.2 - 11.6	0.60	A
Vanadium	NR	55.0				38.5 - 71.5		
Zinc	NR	70				49 - 91		

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	360	404	A		-10.9	283 - 525	15	A
Cesium-137	1556	1550	A		0.4	1085 - 2015	49	A
Cobalt-57	408	401	A		1.7	281 - 521	24	A
Cobalt-60	625	660	A		-5.3	462 - 858	23	A
Iron-55	NR	650				455 - 845		
Manganese-54	326	332	A		-1.8	232 - 432	14	A
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	NR	34.7				24.3 - 45.1		
Plutonium-239/240	NR	0.37				Sensitivity Evaluation		
Potassium-40	498	485	A		2.7	340 - 631	39	A
Strontium-90	376	440	A		-14.5	308 - 572	53	A

Radiological								Units: (Bq/kg)
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	336				235 - 437		
Thorium-228	NR	48.8				34.2 - 63.4		
Thorium-230	NR	54				38 - 70		
Thorium-232	NR	45.1				31.6 - 58.6		
Uranium-234	NR	40.7				28.5 - 52.9		
Uranium-238	NR	110				77 - 143		
Zinc-65	696	703	A		-1.0	492 - 914	28	A

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

MAPEP Mixed Analyte Performance Evaluation Program

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

Laboratory Results For MAPEP-24-MaS50
(SEML01) SRS Environmental Monitoring Laboratory
Bldg 735-B
Aiken, SC 29808

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	8.4				5.9 - 10.9		
Arsenic	NR	24.5				17.2 - 31.9		
Barium	NR	197				138 - 256		
Beryllium	NR	23.0				16.1 - 29.9		
Cadmium	NR	4.74				3.32 - 6.16		
Chromium	NR	11.7				8.2 - 15.2		
Cobalt	NR	29.1				20.4 - 37.8		
Copper	NR	46.3				32.4 - 60.2		
Lead	NR	23.6				16.5 - 30.7		
Mercury	NR	0.257				0.180 - 0.334		
Nickel	NR	33.3				23.3 - 43.3		
Selenium	NR	8.26				5.78 - 10.74		
Silver	NR	5.42				3.79 - 7.05		
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	NR	2.85				2.00 - 3.71		
Uranium-235	NR	0.0317				0.0222 - 0.0412		
Uranium-238	NR	8.8				6.2 - 11.4		
Uranium-Total	NR	8.9				6.2 - 11.6		
Vanadium	NR	55.0				38.5 - 71.5		
Zinc	NR	70				49 - 91		

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.31		A			False Positive Test	0.15	
Cesium-134	334	404	A		-17.3	283 - 525	24	A
Cesium-137	1300	1550	A		-16.1	1085 - 2015	126	A
Cobalt-57	319	401	W		-20.4	281 - 521	25	A
Cobalt-60	561	660	A		-15.0	462 - 858	44	A
Iron-55	NR	650				455 - 845		
Manganese-54	287	332	A		-13.6	232 - 432	29	A
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	35.4	34.7	A		2.0	24.3 - 45.1	2.1	A
Plutonium-239/240	0.17	0.37	A	(17)		Sensitivity Evaluation	0.36	
Potassium-40	436	485	A		-10.1	340 - 631	42	A
Strontium-90	392	440	A		-10.9	308 - 572	24	A

Radiological								Units: (Bq/kg)
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	336				235 - 437		
Thorium-228	44.4	48.8	A		-9.0	34.2 - 63.4	3.1	A
Thorium-230	48.5	54	A		-10.2	38 - 70	3.3	A
Thorium-232	40.1	45.1	A		-11.1	31.6 - 58.6	2.7	A
Uranium-234	44.4	40.7	A		9.1	28.5 - 52.9	2.7	A
Uranium-238	118.9	110	A		8.1	77 - 143	6.0	A
Zinc-65	636	703	A		-9.5	492 - 914	60	A

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

Laboratory Results For MAPEP-24-MaS50
(SLAC01) SLAC DOE National Accelerator Laboratory
2575 Sand Hill Road
Menlo Park, CA 94025

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	8.4				5.9 - 10.9		
Arsenic	NR	24.5				17.2 - 31.9		
Barium	NR	197				138 - 256		
Beryllium	NR	23.0				16.1 - 29.9		
Cadmium	NR	4.74				3.32 - 6.16		
Chromium	NR	11.7				8.2 - 15.2		
Cobalt	NR	29.1				20.4 - 37.8		
Copper	NR	46.3				32.4 - 60.2		
Lead	NR	23.6				16.5 - 30.7		
Mercury	NR	0.257				0.180 - 0.334		
Nickel	NR	33.3				23.3 - 43.3		
Selenium	NR	8.26				5.78 - 10.74		
Silver	NR	5.42				3.79 - 7.05		
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	NR	2.85				2.00 - 3.71		
Uranium-235	NR	0.0317				0.0222 - 0.0412		
Uranium-238	NR	8.8				6.2 - 11.4		
Uranium-Total	NR	8.9				6.2 - 11.6		
Vanadium	NR	55.0				38.5 - 71.5		
Zinc	NR	70				49 - 91		

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	360.9	404	A		-10.7	283 - 525	36.09	A
Cesium-137	1471.1	1550	A		-5.1	1085 - 2015	147.11	A
Cobalt-57	388.7	401	A		-3.1	281 - 521	38.87	A
Cobalt-60	630.21	660	A		-4.5	462 - 858	63.02	A
Iron-55	NR	650				455 - 845		
Manganese-54	321.55	332	A		-3.1	232 - 432	32.16	A
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	NR	34.7				24.3 - 45.1		
Plutonium-239/240	NR	0.37				Sensitivity Evaluation		
Potassium-40	435.53	485	A		-10.2	340 - 631	43.55	A
Strontium-90	NR	440				308 - 572		

Radiological								Units: (Bq/kg)
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	336				235 - 437		
Thorium-228	NR	48.8				34.2 - 63.4		
Thorium-230	NR	54				38 - 70		
Thorium-232	NR	45.1				31.6 - 58.6		
Uranium-234	NR	40.7				28.5 - 52.9		
Uranium-238	NR	110				77 - 143		
Zinc-65	702.27	703	A		-0.1	492 - 914	70.23	A

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

MAPEP Mixed Analyte Performance Evaluation Program

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

Laboratory Results For MAPEP-24-MaS50
(SOUT01) Southwest Research Institute
6220 Culebra Rd.
San Antonio, TX 78238-5166

Inorganic — Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	8.4				5.9 - 10.9		
Arsenic	NR	24.5				17.2 - 31.9		
Barium	NR	197				138 - 256		
Beryllium	NR	23.0				16.1 - 29.9		
Cadmium	NR	4.74				3.32 - 6.16		
Chromium	NR	11.7				8.2 - 15.2		
Cobalt	NR	29.1				20.4 - 37.8		
Copper	NR	46.3				32.4 - 60.2		
Lead	NR	23.6				16.5 - 30.7		
Mercury	NR	0.257				0.180 - 0.334		
Nickel	NR	33.3				23.3 - 43.3		
Selenium	NR	8.26				5.78 - 10.74		
Silver	NR	5.42				3.79 - 7.05		
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	NR	2.85				2.00 - 3.71		
Uranium-235	0.0280	0.0317	A		-11.7	0.0222 - 0.0412	0.00715	W
Uranium-238	8.18	8.8	A		-7.0	6.2 - 11.4	1.31	W
Uranium-Total	8.21	8.9	A		-7.8	6.2 - 11.6	1.31	W
Vanadium	NR	55.0				38.5 - 71.5		
Zinc	NR	70				49 - 91		

Radiological — Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR		N	(11)		False Positive Test		
Cesium-134	NR	404	N	(28)		283 - 525		
Cesium-137	NR	1550	N	(28)		1085 - 2015		
Cobalt-57	NR	401	N	(28)		281 - 521		
Cobalt-60	NR	660	N	(28)		462 - 858		
Iron-55	510	650	W		-21.5	455 - 845	63.9	A
Manganese-54	NR	332	N	(28)		232 - 432		
Nickel-63	1644	1530	A		7.5	1071 - 1989	99.3	A
Plutonium-238	NR	34.7	N	(28)		24.3 - 45.1		
Plutonium-239/240	NR	0.37	N	(18)		Sensitivity Evaluation		
Potassium-40	NR	485	N	(28)		340 - 631		
Strontium-90	NR	440	N	(28)		308 - 572		

Radiological								Units: (Bq/kg)
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	254	336	W		-24.4	235 - 437	15.7	A
Thorium-228	58.9	48.8	W		20.7	34.2 - 63.4	4.81	A
Thorium-230	56.7	54	A		5.0	38 - 70	4.63	A
Thorium-232	50.7	45.1	A		12.4	31.6 - 58.6	4.19	A
Uranium-234	NR	40.7	N	(28)		28.5 - 52.9		
Uranium-238	NR	110	N	(28)		77 - 143		
Zinc-65	NR	703	N	(28)		492 - 914		

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

Laboratory Results For MAPEP-24-MaS50

(SRPD01) Sandia National Laboratories, Radiation Protection Sample Diagnostics
PO Box 5800, MS1103
Albuquerque, NM 87185-1103

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	8.4				5.9 - 10.9		
Arsenic	NR	24.5				17.2 - 31.9		
Barium	NR	197				138 - 256		
Beryllium	NR	23.0				16.1 - 29.9		
Cadmium	NR	4.74				3.32 - 6.16		
Chromium	NR	11.7				8.2 - 15.2		
Cobalt	NR	29.1				20.4 - 37.8		
Copper	NR	46.3				32.4 - 60.2		
Lead	NR	23.6				16.5 - 30.7		
Mercury	NR	0.257				0.180 - 0.334		
Nickel	NR	33.3				23.3 - 43.3		
Selenium	NR	8.26				5.78 - 10.74		
Silver	NR	5.42				3.79 - 7.05		
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	NR	2.85				2.00 - 3.71		
Uranium-235	NR	0.0317				0.0222 - 0.0412		
Uranium-238	NR	8.8				6.2 - 11.4		
Uranium-Total	NR	8.9				6.2 - 11.6		
Vanadium	NR	55.0				38.5 - 71.5		
Zinc	NR	70				49 - 91		

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	4.09E+02	404	A		1.2	283 - 525	2.66	A
Cesium-137	1.57E+03	1550	A		1.3	1085 - 2015	9.46	A
Cobalt-57	3.99E+02	401	A		-0.5	281 - 521	4.00	A
Cobalt-60	6.65E+02	660	A		0.8	462 - 858	2.68	A
Iron-55	NR	650				455 - 845		
Manganese-54	3.37E+02	332	A		1.5	232 - 432	2.04	A
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	NR	34.7				24.3 - 45.1		
Plutonium-239/240	NR	0.37				Sensitivity Evaluation		
Potassium-40	4.70E+02	485	A		-3.1	340 - 631	2.09	A
Strontium-90	NR	440				308 - 572		

Radiological								Units: (Bq/kg)
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	336				235 - 437		
Thorium-228	NR	48.8				34.2 - 63.4		
Thorium-230	NR	54				38 - 70		
Thorium-232	NR	45.1				31.6 - 58.6		
Uranium-234	NR	40.7				28.5 - 52.9		
Uranium-238	NR	110				77 - 143		
Zinc-65	7.14E+02	703	A		1.6	492 - 914	3.15	A

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

Laboratory Results For MAPEP-24-MaS50
(STRL01) South Texas Project Radiological Laboratory
12090 FM 521
Wadsworth, Texas 77483

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	8.4				5.9 - 10.9		
Arsenic	NR	24.5				17.2 - 31.9		
Barium	NR	197				138 - 256		
Beryllium	NR	23.0				16.1 - 29.9		
Cadmium	NR	4.74				3.32 - 6.16		
Chromium	NR	11.7				8.2 - 15.2		
Cobalt	NR	29.1				20.4 - 37.8		
Copper	NR	46.3				32.4 - 60.2		
Lead	NR	23.6				16.5 - 30.7		
Mercury	NR	0.257				0.180 - 0.334		
Nickel	NR	33.3				23.3 - 43.3		
Selenium	NR	8.26				5.78 - 10.74		
Silver	NR	5.42				3.79 - 7.05		
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	NR	2.85				2.00 - 3.71		
Uranium-235	NR	0.0317				0.0222 - 0.0412		
Uranium-238	NR	8.8				6.2 - 11.4		
Uranium-Total	NR	8.9				6.2 - 11.6		
Vanadium	NR	55.0				38.5 - 71.5		
Zinc	NR	70				49 - 91		

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	399.8	404	A		-1.0	283 - 525	3.2	N
Cesium-137	1579	1550	A		1.9	1085 - 2015	2.2	N
Cobalt-57	401.2	401	A		0.1	281 - 521	7.0	N
Cobalt-60	668.6	660	A		1.3	462 - 858	5.8	N
Iron-55	NR	650				455 - 845		
Manganese-54	350.4	332	A		5.5	232 - 432	5.2	N
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	NR	34.7				24.3 - 45.1		
Plutonium-239/240	NR	0.37				Sensitivity Evaluation		
Potassium-40	NR	485	N	(25)		340 - 631		
Strontium-90	NR	440				308 - 572		

Radiological								Units: (Bq/kg)
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	336				235 - 437		
Thorium-228	NR	48.8				34.2 - 63.4		
Thorium-230	NR	54				38 - 70		
Thorium-232	NR	45.1				31.6 - 58.6		
Uranium-234	NR	40.7				28.5 - 52.9		
Uranium-238	NR	110				77 - 143		
Zinc-65	778.4	703	A		10.7	492 - 914	10.2	N

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

Laboratory Results For MAPEP-24-MaS50
(TDHL01) Texas Department of State Health Services Laboratory
1100 W 49th Street
Austin, TX 78756

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	8.4				5.9 - 10.9		
Arsenic	NR	24.5				17.2 - 31.9		
Barium	NR	197				138 - 256		
Beryllium	NR	23.0				16.1 - 29.9		
Cadmium	NR	4.74				3.32 - 6.16		
Chromium	NR	11.7				8.2 - 15.2		
Cobalt	NR	29.1				20.4 - 37.8		
Copper	NR	46.3				32.4 - 60.2		
Lead	NR	23.6				16.5 - 30.7		
Mercury	NR	0.257				0.180 - 0.334		
Nickel	NR	33.3				23.3 - 43.3		
Selenium	NR	8.26				5.78 - 10.74		
Silver	NR	5.42				3.79 - 7.05		
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	NR	2.85				2.00 - 3.71		
Uranium-235	NR	0.0317				0.0222 - 0.0412		
Uranium-238	NR	8.8				6.2 - 11.4		
Uranium-Total	NR	8.9				6.2 - 11.6		
Vanadium	NR	55.0				38.5 - 71.5		
Zinc	NR	70				49 - 91		

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR		N	(11)		False Positive Test		
Cesium-134	368.3	404	A		-8.8	283 - 525	9.9	A
Cesium-137	1498	1550	A		-3.4	1085 - 2015	62	A
Cobalt-57	392	401	A		-2.2	281 - 521	14	A
Cobalt-60	621	660	A		-5.9	462 - 858	14	A
Iron-55	NR	650				455 - 845		
Manganese-54	317	332	A		-4.5	232 - 432	13	A
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	NR	34.7	N	(28)		24.3 - 45.1		
Plutonium-239/240	NR	0.37	N	(18)		Sensitivity Evaluation		
Potassium-40	502	485	A		3.5	340 - 631	36	A
Strontium-90	404	440	A		-8.2	308 - 572	14	A

Radiological								Units: (Bq/kg)
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	336				235 - 437		
Thorium-228	NR	48.8				34.2 - 63.4		
Thorium-230	NR	54				38 - 70		
Thorium-232	NR	45.1				31.6 - 58.6		
Uranium-234	31.5	40.7	W		-22.6	28.5 - 52.9	3.6	A
Uranium-238	92.9	110	A		-15.5	77 - 143	8.0	A
Zinc-65	688	703	A		-2.1	492 - 914	26	A

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

MAPEP Mixed Analyte Performance Evaluation Program

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

Laboratory Results For MAPEP-24-MaS50

(TELE01) Teledyne Brown Engineering - Environmental Services
2508 Quality Lane
Knoxville, TN 37931-6819

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	8.4				5.9 - 10.9		
Arsenic	NR	24.5				17.2 - 31.9		
Barium	NR	197				138 - 256		
Beryllium	NR	23.0				16.1 - 29.9		
Cadmium	NR	4.74				3.32 - 6.16		
Chromium	NR	11.7				8.2 - 15.2		
Cobalt	NR	29.1				20.4 - 37.8		
Copper	NR	46.3				32.4 - 60.2		
Lead	NR	23.6				16.5 - 30.7		
Mercury	NR	0.257				0.180 - 0.334		
Nickel	NR	33.3				23.3 - 43.3		
Selenium	NR	8.26				5.78 - 10.74		
Silver	NR	5.42				3.79 - 7.05		
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	NR	2.85				2.00 - 3.71		
Uranium-235	NR	0.0317				0.0222 - 0.0412		
Uranium-238	NR	8.8				6.2 - 11.4		
Uranium-Total	NR	8.9				6.2 - 11.6		
Vanadium	NR	55.0				38.5 - 71.5		
Zinc	NR	70				49 - 91		

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	NR	404				283 - 525		
Cesium-137	NR	1550				1085 - 2015		
Cobalt-57	NR	401				281 - 521		
Cobalt-60	NR	660				462 - 858		
Iron-55	297	650	N		-54.3	455 - 845	60.27	W
Manganese-54	NR	332				232 - 432		
Nickel-63	1070	1530	N		-30.1	1071 - 1989	91.3	A
Plutonium-238	NR	34.7				24.3 - 45.1		
Plutonium-239/240	NR	0.37				Sensitivity Evaluation		
Potassium-40	NR	485				340 - 631		
Strontium-90	NR	440				308 - 572		

Radiological — Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	325	336	A		-3.3	235 - 437	34.6	A
Thorium-228	34.6	48.8	W		-29.1	34.2 - 63.4	12.2	N
Thorium-230	49.7	54	A		-8.0	38 - 70	14.9	W
Thorium-232	36.4	45.1	A		-19.3	31.6 - 58.6	12.1	N
Uranium-234	NR	40.7				28.5 - 52.9		
Uranium-238	NR	110				77 - 143		
Zinc-65	NR	703				492 - 914		

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

Laboratory Results For MAPEP-24-MaS50
(TELE02) Microbac Laboratories Inc. - Northbrook
700 Landwehr Road
Northbrook, IL 60062-

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	8.4				5.9 - 10.9		
Arsenic	NR	24.5				17.2 - 31.9		
Barium	NR	197				138 - 256		
Beryllium	NR	23.0				16.1 - 29.9		
Cadmium	NR	4.74				3.32 - 6.16		
Chromium	NR	11.7				8.2 - 15.2		
Cobalt	NR	29.1				20.4 - 37.8		
Copper	NR	46.3				32.4 - 60.2		
Lead	NR	23.6				16.5 - 30.7		
Mercury	NR	0.257				0.180 - 0.334		
Nickel	NR	33.3				23.3 - 43.3		
Selenium	NR	8.26				5.78 - 10.74		
Silver	NR	5.42				3.79 - 7.05		
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	NR	2.85				2.00 - 3.71		
Uranium-235	NR	0.0317				0.0222 - 0.0412		
Uranium-238	NR	8.8				6.2 - 11.4		
Uranium-Total	NR	8.9				6.2 - 11.6		
Vanadium	NR	55.0				38.5 - 71.5		
Zinc	NR	70				49 - 91		

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	345	404	A		-14.6	283 - 525	2	N
Cesium-137	1539	1550	A		-0.7	1085 - 2015	7	N
Cobalt-57	355	401	A		-11.5	281 - 521	4	N
Cobalt-60	619	660	A		-6.2	462 - 858	4	N
Iron-55	NR	650				455 - 845		
Manganese-54	332	332	A		0.0	232 - 432	13	A
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	NR	34.7				24.3 - 45.1		
Plutonium-239/240	NR	0.37				Sensitivity Evaluation		
Potassium-40	510	485	A		5.2	340 - 631	20	A
Strontium-90	NR	440				308 - 572		

Radiological								Units: (Bq/kg)
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	336				235 - 437		
Thorium-228	NR	48.8				34.2 - 63.4		
Thorium-230	NR	54				38 - 70		
Thorium-232	NR	45.1				31.6 - 58.6		
Uranium-234	NR	40.7				28.5 - 52.9		
Uranium-238	NR	110				77 - 143		
Zinc-65	543	703	W		-22.8	492 - 914	9	N

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

MAPEP Mixed Analyte Performance Evaluation Program
Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-24-MaS50
(TMAO01) EBERLINE Analytical Corporation
601 A SCARBORO RD
OAK RIDGE, TN 37830-

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	8.4				5.9 - 10.9		
Arsenic	NR	24.5				17.2 - 31.9		
Barium	NR	197				138 - 256		
Beryllium	NR	23.0				16.1 - 29.9		
Cadmium	NR	4.74				3.32 - 6.16		
Chromium	NR	11.7				8.2 - 15.2		
Cobalt	NR	29.1				20.4 - 37.8		
Copper	NR	46.3				32.4 - 60.2		
Lead	NR	23.6				16.5 - 30.7		
Mercury	NR	0.257				0.180 - 0.334		
Nickel	NR	33.3				23.3 - 43.3		
Selenium	NR	8.26				5.78 - 10.74		
Silver	NR	5.42				3.79 - 7.05		
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	NR	2.85				2.00 - 3.71		
Uranium-235	NR	0.0317				0.0222 - 0.0412		
Uranium-238	NR	8.8				6.2 - 11.4		
Uranium-Total	NR	8.9				6.2 - 11.6		
Vanadium	NR	55.0				38.5 - 71.5		
Zinc	NR	70				49 - 91		

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.178		A			False Positive Test	2.068	
Cesium-134	390.31	404	A		-3.4	283 - 525	20.795	A
Cesium-137	1714.6	1550	A		10.6	1085 - 2015	152.0	A
Cobalt-57	462.3	401	A		15.3	281 - 521	27.87	A
Cobalt-60	744.2	660	A		12.8	462 - 858	42.64	A
Iron-55	NR	650				455 - 845		
Manganese-54	390.31	332	A		17.6	232 - 432	33.959	A
Nickel-63	1658	1530	A		8.4	1071 - 1989	51.72	A
Plutonium-238	36.88	34.7	A		6.3	24.3 - 45.1	8.42	W
Plutonium-239/240	0.173	0.37	A	(17)		Sensitivity Evaluation	1.848	
Potassium-40	561.8	485	A		15.8	340 - 631	69.18	A
Strontium-90	461.9	440	A		5.0	308 - 572	14.9	A

Radiological — Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	338.5	336	A		0.7	235 - 437	26.6	A
Thorium-228	63.76	48.8	N		30.7	34.2 - 63.4	16.49	W
Thorium-230	62.15	54	A		15.1	38 - 70	15.87	W
Thorium-232	56.55	45.1	W		25.4	31.6 - 58.6	14.86	W
Uranium-234	42.49	40.7	A		4.4	28.5 - 52.9	6.64	W
Uranium-238	106.86	110	A		-2.9	77 - 143	11.95	A
Zinc-65	735.2	703	A		4.6	492 - 914	71.3	A

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

Laboratory Results For MAPEP-24-MaS50
(TNUT01) St. Louis USACE FUSRAP Laboratory
112 James S McDonnell Blvd
HAZELWOOD, MO 63042

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	8.4				5.9 - 10.9		
Arsenic	NR	24.5				17.2 - 31.9		
Barium	NR	197				138 - 256		
Beryllium	NR	23.0				16.1 - 29.9		
Cadmium	NR	4.74				3.32 - 6.16		
Chromium	NR	11.7				8.2 - 15.2		
Cobalt	NR	29.1				20.4 - 37.8		
Copper	NR	46.3				32.4 - 60.2		
Lead	NR	23.6				16.5 - 30.7		
Mercury	NR	0.257				0.180 - 0.334		
Nickel	NR	33.3				23.3 - 43.3		
Selenium	NR	8.26				5.78 - 10.74		
Silver	NR	5.42				3.79 - 7.05		
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	NR	2.85				2.00 - 3.71		
Uranium-235	NR	0.0317				0.0222 - 0.0412		
Uranium-238	NR	8.8				6.2 - 11.4		
Uranium-Total	NR	8.9				6.2 - 11.6		
Vanadium	NR	55.0				38.5 - 71.5		
Zinc	NR	70				49 - 91		

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	-1.18		A			False Positive Test	1.11	
Cesium-134	351	404	A		-13.1	283 - 525	5.66	N
Cesium-137	1570	1550	A		1.3	1085 - 2015	40.9	A
Cobalt-57	401	401	A		0.0	281 - 521	7.31	N
Cobalt-60	660	660	A		0.0	462 - 858	11.6	N
Iron-55	NR	650				455 - 845		
Manganese-54	349	332	A		5.1	232 - 432	8.18	A
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	27.8	34.7	A		-19.9	24.3 - 45.1	3.29	A
Plutonium-239/240	0.222	0.37	A	(17)		Sensitivity Evaluation	0.345	
Potassium-40	528	485	A		8.9	340 - 631	16.8	A
Strontium-90	NR	440				308 - 572		

Radiological								Units: (Bq/kg)
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	336				235 - 437		
Thorium-228	44.9	48.8	A		-8.0	34.2 - 63.4	4.51	A
Thorium-230	47.9	54	A		-11.3	38 - 70	4.72	A
Thorium-232	43.3	45.1	A		-4.0	31.6 - 58.6	4.39	A
Uranium-234	46.0	40.7	A		13.0	28.5 - 52.9	6.86	A
Uranium-238	130	110	A		18.2	77 - 143	12.7	A
Zinc-65	771	703	A		9.7	492 - 914	19.4	A

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

MAPEP Mixed Analyte Performance Evaluation Program
Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-24-MaS50
(UNTE01) UniTech-235
178 Aldo Drive
Barnwell, SC 29812

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	8.4				5.9 - 10.9		
Arsenic	NR	24.5				17.2 - 31.9		
Barium	NR	197				138 - 256		
Beryllium	NR	23.0				16.1 - 29.9		
Cadmium	NR	4.74				3.32 - 6.16		
Chromium	NR	11.7				8.2 - 15.2		
Cobalt	NR	29.1				20.4 - 37.8		
Copper	NR	46.3				32.4 - 60.2		
Lead	NR	23.6				16.5 - 30.7		
Mercury	NR	0.257				0.180 - 0.334		
Nickel	NR	33.3				23.3 - 43.3		
Selenium	NR	8.26				5.78 - 10.74		
Silver	NR	5.42				3.79 - 7.05		
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	NR	2.85				2.00 - 3.71		
Uranium-235	NR	0.0317				0.0222 - 0.0412		
Uranium-238	NR	8.8				6.2 - 11.4		
Uranium-Total	NR	8.9				6.2 - 11.6		
Vanadium	NR	55.0				38.5 - 71.5		
Zinc	NR	70				49 - 91		

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	420.69	404	A		4.1	283 - 525	15.99	A
Cesium-137	1906.61	1550	W		23.0	1085 - 2015	106.30	A
Cobalt-57	488.77	401	W		21.9	281 - 521	24.19	A
Cobalt-60	795.13	660	W		20.5	462 - 858	29.91	A
Iron-55	NR	650				455 - 845		
Manganese-54	427.35	332	W		28.7	232 - 432	21.53	A
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	NR	34.7				24.3 - 45.1		
Plutonium-239/240	NR	0.37				Sensitivity Evaluation		
Potassium-40	1906.61	485	N		293.1	340 - 631	106.30	A
Strontium-90	NR	440				308 - 572		

Radiological								Units: (Bq/kg)
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	336				235 - 437		
Thorium-228	NR	48.8				34.2 - 63.4		
Thorium-230	NR	54				38 - 70		
Thorium-232	NR	45.1				31.6 - 58.6		
Uranium-234	NR	40.7				28.5 - 52.9		
Uranium-238	NR	110				77 - 143		
Zinc-65	755.16	703	A		7.4	492 - 914	39.05	A

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

Laboratory Results For MAPEP-24-MaS50
(WEST04) PACE ANALYTICAL SERVICES, PITTSBURGH 1638
Roseytown Road
Greensburg, PA 15601

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	8.4				5.9 - 10.9		
Arsenic	NR	24.5				17.2 - 31.9		
Barium	NR	197				138 - 256		
Beryllium	NR	23.0				16.1 - 29.9		
Cadmium	NR	4.74				3.32 - 6.16		
Chromium	NR	11.7				8.2 - 15.2		
Cobalt	NR	29.1				20.4 - 37.8		
Copper	NR	46.3				32.4 - 60.2		
Lead	NR	23.6				16.5 - 30.7		
Mercury	NR	0.257				0.180 - 0.334		
Nickel	NR	33.3				23.3 - 43.3		
Selenium	NR	8.26				5.78 - 10.74		
Silver	NR	5.42				3.79 - 7.05		
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	NR	2.85				2.00 - 3.71		
Uranium-235	NR	0.0317				0.0222 - 0.0412		
Uranium-238	NR	8.8				6.2 - 11.4		
Uranium-Total	NR	8.9				6.2 - 11.6		
Vanadium	NR	55.0				38.5 - 71.5		
Zinc	NR	70				49 - 91		

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	356.96	404	A		-11.6	283 - 525	25.456	A
Cesium-137	1468.90	1550	A		-5.2	1085 - 2015	103.49	A
Cobalt-57	382.81	401	A		-4.5	281 - 521	27.276	A
Cobalt-60	629.83	660	A		-4.6	462 - 858	42.022	A
Iron-55	NR	650				455 - 845		
Manganese-54	335.83	332	A		1.2	232 - 432	23.851	A
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	NR	34.7				24.3 - 45.1		
Plutonium-239/240	NR	0.37				Sensitivity Evaluation		
Potassium-40	526.28	485	A		8.5	340 - 631	40.077	A
Strontium-90	NR	440				308 - 572		

Radiological								Units: (Bq/kg)
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	336				235 - 437		
Thorium-228	NR	48.8				34.2 - 63.4		
Thorium-230	NR	54				38 - 70		
Thorium-232	NR	45.1				31.6 - 58.6		
Uranium-234	NR	40.7				28.5 - 52.9		
Uranium-238	NR	110				77 - 143		
Zinc-65	730.49	703	A		3.9	492 - 914	49.412	A

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

Laboratory Results For MAPEP-24-MaS50
(WIPH01) WI, DPH, Radiation Protection Section
1 West Wilson Street
Madison, WI 53703

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	8.4				5.9 - 10.9		
Arsenic	NR	24.5				17.2 - 31.9		
Barium	NR	197				138 - 256		
Beryllium	NR	23.0				16.1 - 29.9		
Cadmium	NR	4.74				3.32 - 6.16		
Chromium	NR	11.7				8.2 - 15.2		
Cobalt	NR	29.1				20.4 - 37.8		
Copper	NR	46.3				32.4 - 60.2		
Lead	NR	23.6				16.5 - 30.7		
Mercury	NR	0.257				0.180 - 0.334		
Nickel	NR	33.3				23.3 - 43.3		
Selenium	NR	8.26				5.78 - 10.74		
Silver	NR	5.42				3.79 - 7.05		
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	NR	2.85				2.00 - 3.71		
Uranium-235	NR	0.0317				0.0222 - 0.0412		
Uranium-238	NR	8.8				6.2 - 11.4		
Uranium-Total	NR	8.9				6.2 - 11.6		
Vanadium	NR	55.0				38.5 - 71.5		
Zinc	NR	70				49 - 91		

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	-4.194		A			False Positive Test	5.884	
Cesium-134	388.945	404	A		-3.7	283 - 525	8.701	A
Cesium-137	1455.502	1550	A		-6.1	1085 - 2015	87.462	A
Cobalt-57	370.890	401	A		-7.5	281 - 521	26.721	A
Cobalt-60	653.714	660	A		-1.0	462 - 858	18.558	A
Iron-55	NR	650				455 - 845		
Manganese-54	305.901	332	A		-7.9	232 - 432	15.709	A
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	NR	34.7				24.3 - 45.1		
Plutonium-239/240	NR	0.37				Sensitivity Evaluation		
Potassium-40	431.674	485	A		-11.0	340 - 631	18.928	A
Strontium-90	NR	440				308 - 572		

Radiological								Units: (Bq/kg)
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	336				235 - 437		
Thorium-228	NR	48.8				34.2 - 63.4		
Thorium-230	NR	54				38 - 70		
Thorium-232	NR	45.1				31.6 - 58.6		
Uranium-234	NR	40.7				28.5 - 52.9		
Uranium-238	NR	110				77 - 143		
Zinc-65	647.198	703	A		-7.9	492 - 914	26.261	A

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

MAPEP Mixed Analyte Performance Evaluation Program
Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-24-MaS50
(WIPP01) WIPP Laboratories
1400 University Drive
Carlsbad, NM 88220

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	8.4				5.9 - 10.9		
Arsenic	NR	24.5				17.2 - 31.9		
Barium	NR	197				138 - 256		
Beryllium	NR	23.0				16.1 - 29.9		
Cadmium	NR	4.74				3.32 - 6.16		
Chromium	NR	11.7				8.2 - 15.2		
Cobalt	NR	29.1				20.4 - 37.8		
Copper	NR	46.3				32.4 - 60.2		
Lead	NR	23.6				16.5 - 30.7		
Mercury	NR	0.257				0.180 - 0.334		
Nickel	NR	33.3				23.3 - 43.3		
Selenium	NR	8.26				5.78 - 10.74		
Silver	NR	5.42				3.79 - 7.05		
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	NR	2.85				2.00 - 3.71		
Uranium-235	NR	0.0317				0.0222 - 0.0412		
Uranium-238	NR	8.8				6.2 - 11.4		
Uranium-Total	NR	8.9				6.2 - 11.6		
Vanadium	NR	55.0				38.5 - 71.5		
Zinc	NR	70				49 - 91		

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	7.43E-001		A			False Positive Test	3.27E-	
Cesium-134	3.48E+002	404	A		-13.9	283 - 525	4.09	N
Cesium-137	1.37E+002	1550	N		-91.2	1085 - 2015	1.36	A
Cobalt-57	3.54E+002	401	A		-11.7	281 - 521	8.06	A
Cobalt-60	5.92E+002	660	A		-10.3	462 - 858	8.98	N
Iron-55	NR	650				455 - 845		
Manganese-54	2.96E+002	332	A		-10.8	232 - 432	3.39	N
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	3.73E+001	34.7	A		7.5	24.3 - 45.1	4.47	A
Plutonium-239/240	5.39E-001	0.37	A	(17)		Sensitivity Evaluation	2.86E-	
Potassium-40	4.19E+002	485	A		-13.6	340 - 631	1.06	A
Strontium-90	3.69E+002	440	A		-16.1	308 - 572	2.91	A

Radiological								Units: (Bq/kg)
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	336				235 - 437		
Thorium-228	NR	48.8				34.2 - 63.4		
Thorium-230	NR	54				38 - 70		
Thorium-232	NR	45.1				31.6 - 58.6		
Uranium-234	4.03E+001	40.7	A		-1.0	28.5 - 52.9	4.51	A
Uranium-238	9.78E+001	110	A		-11.1	77 - 143	1.01	A
Zinc-65	6.36E+002	703	A		-9.5	492 - 914	7.35	N

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

MAPEP Mixed Analyte Performance Evaluation Program

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

Laboratory Results For MAPEP-24-MaS50
(WSHL01) Wisconsin State Laboratory of Hygiene
2601 Agriculture Drive
Madison, WI 53718

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	8.4				5.9 - 10.9		
Arsenic	NR	24.5				17.2 - 31.9		
Barium	NR	197				138 - 256		
Beryllium	NR	23.0				16.1 - 29.9		
Cadmium	NR	4.74				3.32 - 6.16		
Chromium	NR	11.7				8.2 - 15.2		
Cobalt	NR	29.1				20.4 - 37.8		
Copper	NR	46.3				32.4 - 60.2		
Lead	NR	23.6				16.5 - 30.7		
Mercury	NR	0.257				0.180 - 0.334		
Nickel	NR	33.3				23.3 - 43.3		
Selenium	NR	8.26				5.78 - 10.74		
Silver	NR	5.42				3.79 - 7.05		
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	NR	2.85				2.00 - 3.71		
Uranium-235	NR	0.0317				0.0222 - 0.0412		
Uranium-238	NR	8.8				6.2 - 11.4		
Uranium-Total	NR	8.9				6.2 - 11.6		
Vanadium	NR	55.0				38.5 - 71.5		
Zinc	NR	70				49 - 91		

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	1.071		A			False Positive Test	1.032	
Cesium-134	367	404	A		-9.2	283 - 525	7.1	N
Cesium-137	1500	1550	A		-3.2	1085 - 2015	44.7	A
Cobalt-57	375	401	A		-6.5	281 - 521	8.28	A
Cobalt-60	634	660	A		-3.9	462 - 858	38.8	A
Iron-55	NR	650				455 - 845		
Manganese-54	326	332	A		-1.8	232 - 432	13.8	A
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	36.62	34.7	A		5.5	24.3 - 45.1	3.564	A
Plutonium-239/240	1.048	0.37	A	(17)		Sensitivity Evaluation	0.8177	
Potassium-40	478	485	A		-1.4	340 - 631	41.9	A
Strontium-90	323.16	440	W		-26.6	308 - 572	20.16	A

Radiological								Units: (Bq/kg)
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	336				235 - 437		
Thorium-228	NR	48.8				34.2 - 63.4		
Thorium-230	NR	54				38 - 70		
Thorium-232	NR	45.1				31.6 - 58.6		
Uranium-234	38.68	40.7	A		-5.0	28.5 - 52.9	3.160	A
Uranium-238	98.37	110	A		-10.6	77 - 143	5.786	A
Zinc-65	703	703	A		0.0	492 - 914	56.3	A

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

Laboratory Results For MAPEP-24-MaS50
(YPGA01) US Army Yuma Proving Ground / Material Analysis Lab
301 C. Street
Yuma, AZ 85365

Inorganic

Units: (mg/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	8.4				5.9 - 10.9		
Arsenic	NR	24.5				17.2 - 31.9		
Barium	NR	197				138 - 256		
Beryllium	NR	23.0				16.1 - 29.9		
Cadmium	NR	4.74				3.32 - 6.16		
Chromium	NR	11.7				8.2 - 15.2		
Cobalt	NR	29.1				20.4 - 37.8		
Copper	NR	46.3				32.4 - 60.2		
Lead	NR	23.6				16.5 - 30.7		
Mercury	NR	0.257				0.180 - 0.334		
Nickel	NR	33.3				23.3 - 43.3		
Selenium	NR	8.26				5.78 - 10.74		
Silver	NR	5.42				3.79 - 7.05		
Technetium-99	NR	5.32E-04				3.72E-4 - 6.92E-4		
Thallium	NR	2.85				2.00 - 3.71		
Uranium-235	0.035	0.0317	A		10.4	0.0222 - 0.0412	0.007	W
Uranium-238	9.7	8.8	A		10.2	6.2 - 11.4	0.7	A
Uranium-Total	9.7	8.9	A		9.0	6.2 - 11.6	0.7	A
Vanadium	NR	55.0				38.5 - 71.5		
Zinc	NR	70				49 - 91		

Radiological

Units: (Bq/kg)

Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	NR	404				283 - 525		
Cesium-137	NR	1550				1085 - 2015		
Cobalt-57	NR	401				281 - 521		
Cobalt-60	NR	660				462 - 858		
Iron-55	NR	650				455 - 845		
Manganese-54	NR	332				232 - 432		
Nickel-63	NR	1530				1071 - 1989		
Plutonium-238	NR	34.7				24.3 - 45.1		
Plutonium-239/240	NR	0.37				Sensitivity Evaluation		
Potassium-40	NR	485				340 - 631		
Strontium-90	NR	440				308 - 572		

Radiological								Units: (Bq/kg)
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	336				235 - 437		
Thorium-228	NR	48.8				34.2 - 63.4		
Thorium-230	NR	54				38 - 70		
Thorium-232	NR	45.1				31.6 - 58.6		
Uranium-234	NR	40.7				28.5 - 52.9		
Uranium-238	NR	110				77 - 143		
Zinc-65	NR	703				492 - 914		

Radiological Reference Date: February 1, 2024

Results Flags:

A = Result acceptable..... |Bias| ≤ 20%

W = Result acceptable with warning..... 20% < |Bias| ≤ 30%

N = Result not acceptable..... |Bias| > 30%

RW = Report Warning

NR = Not Reported

Uncertainty Flags:

NOT ACCEPTABLE.....RP < 2%

ACCEPTABLE.....2% ≤ RP ≤ 15%

ACCEPTABLE WITH WARNING.....15% < RP ≤ 30%

NOT ACCEPTABLE.....RP > 30%

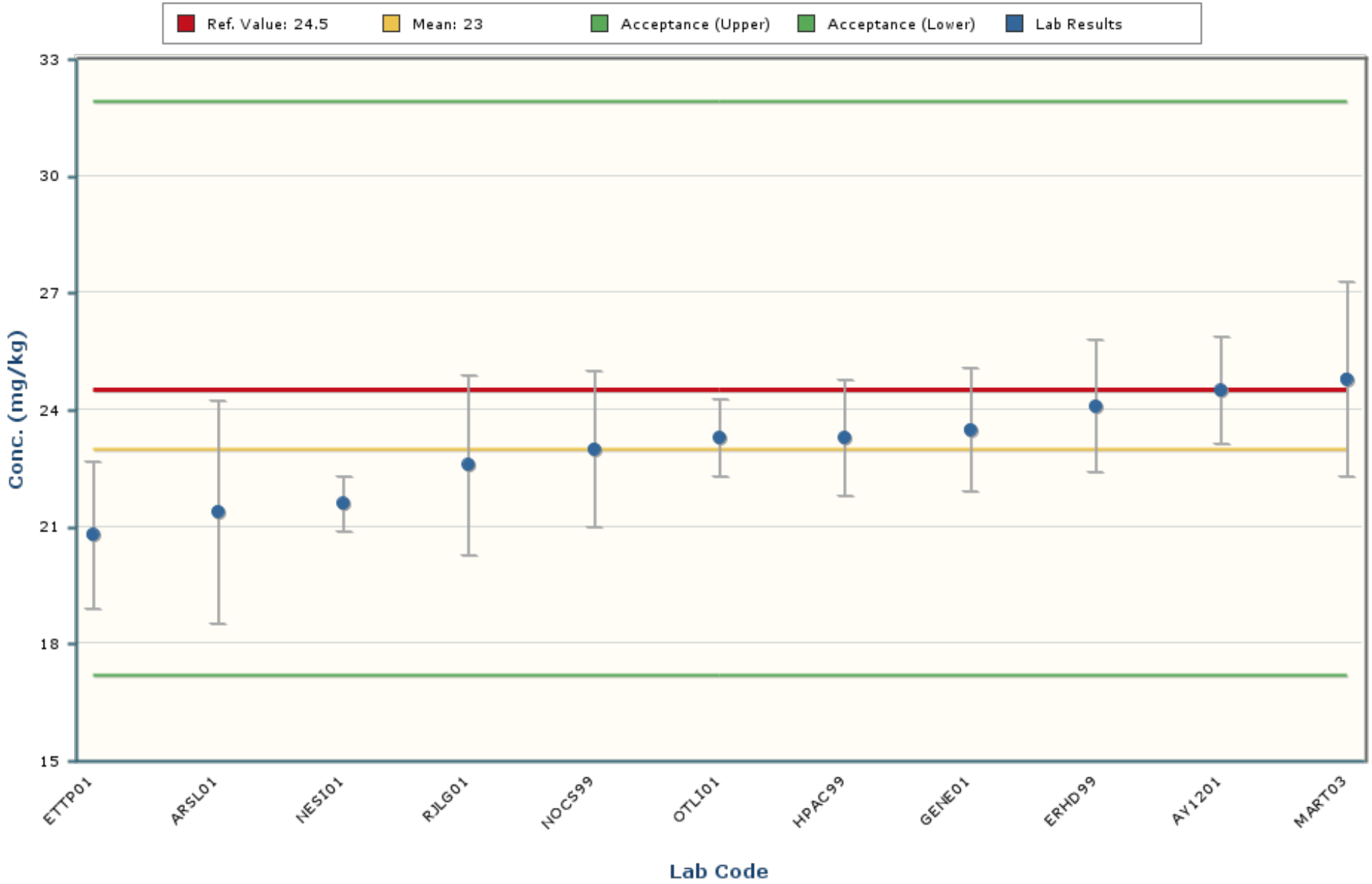
Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

(1) = False Positive
(4) = Sensitivity Evaluation
(5) = Total Metal
(6) = Not Evaluated
(11) = False Positive Test, Result Not Reported
(17) = NOT DETECTED - reported a statistically zero result
(18) = Sensitivity Evaluation, Value Not Reported
(25) = Result not reported with other gamma results
(28) = Not Reporting Previously Reported Analyte

Arsenic

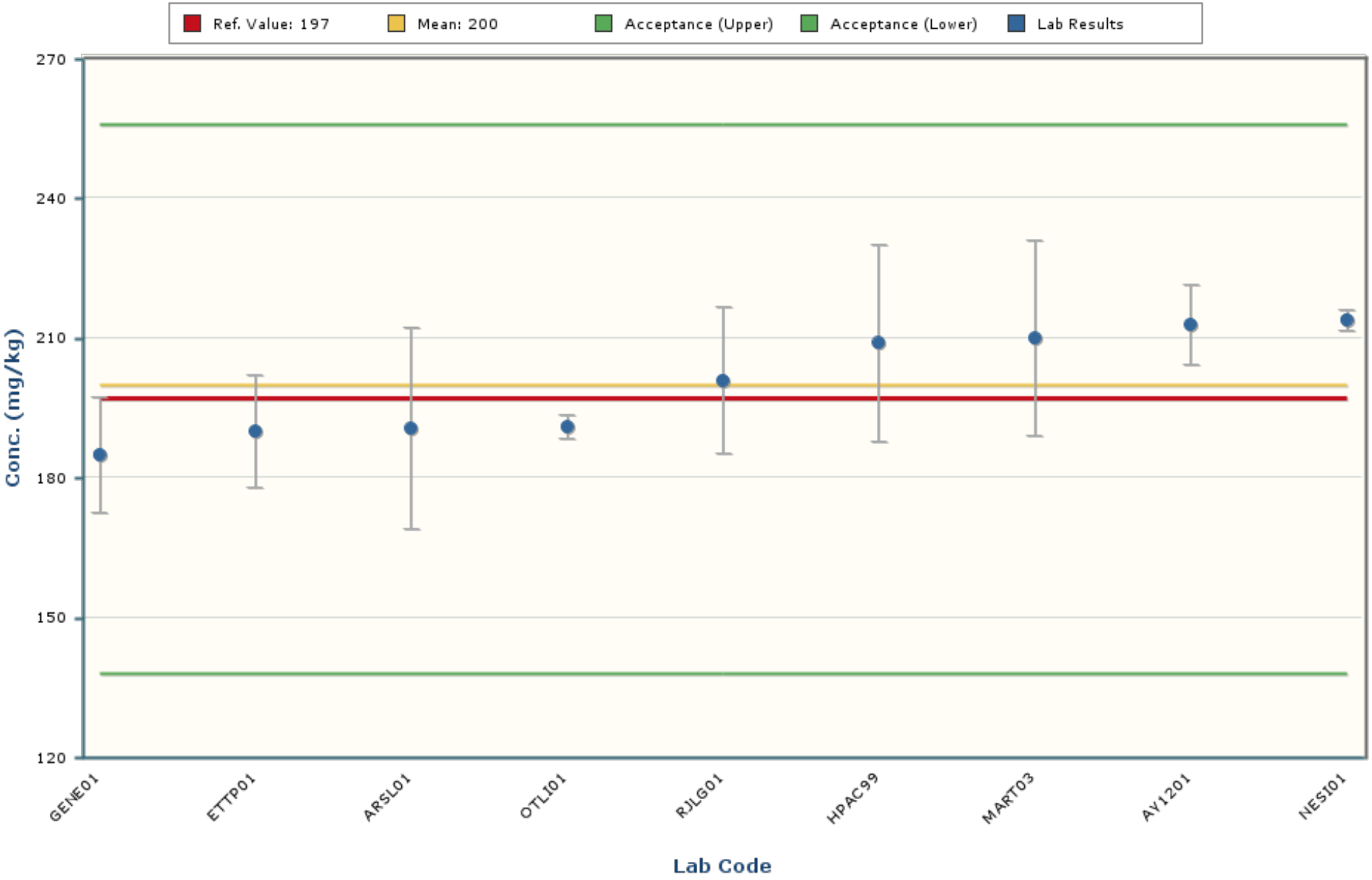
MAPEP-24-MaS50



Notes:
The chart mean excludes values outside of a bias range of ± 30%.
The chart shows only data points with values between 16.2 and 29.8 (± 5 Standard Deviations).
The error bars encompassing each result are plotted at ± one standard deviation.

Barium

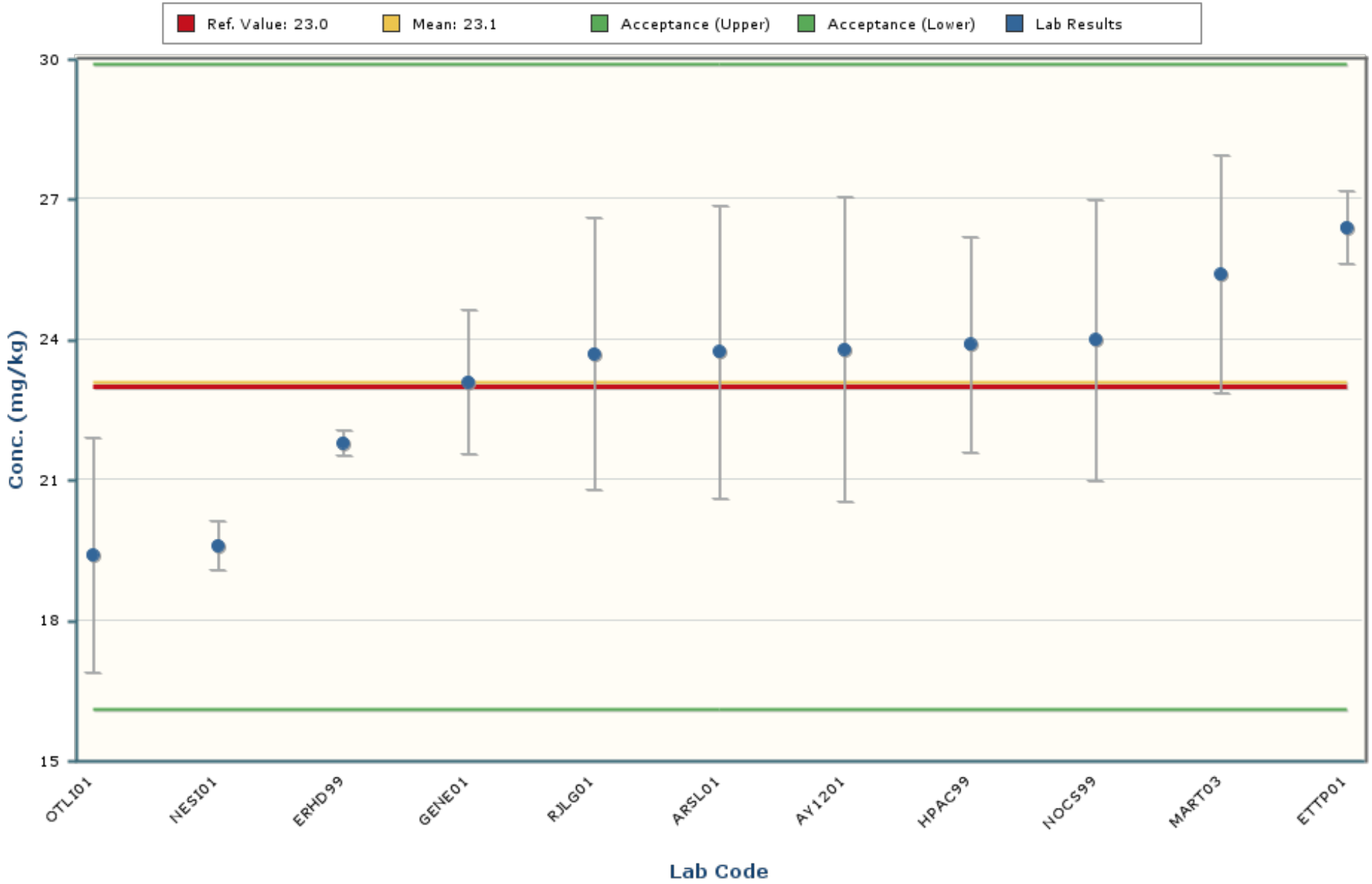
MAPEP-24-MaS50



Notes:
The chart mean excludes values outside of a bias range of ± 30%.
The chart shows only data points with values between 143 and 257 (± 5 Standard Deviations).
The error bars encompassing each result are plotted at ± one standard deviation.

Beryllium

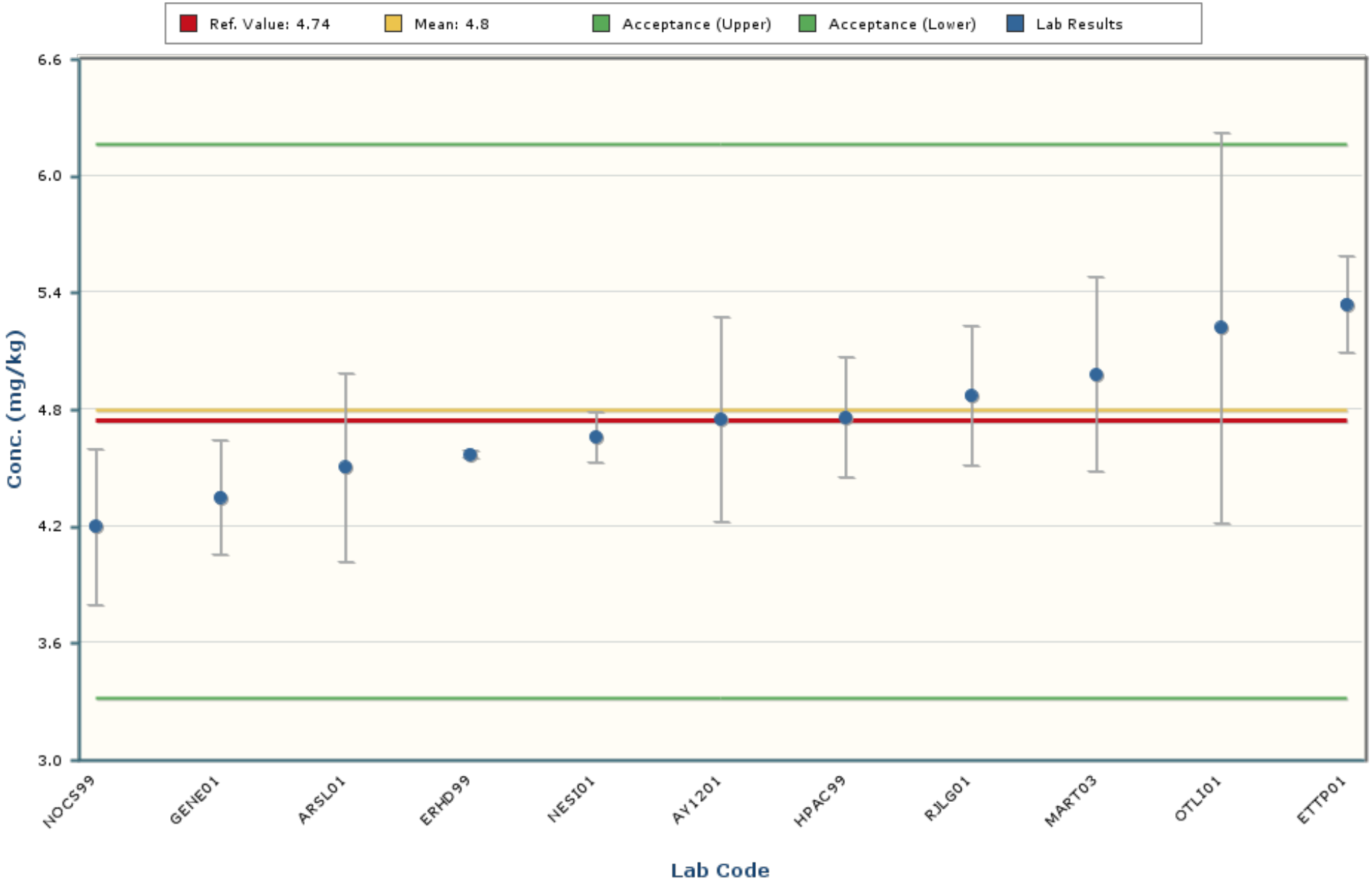
MAPEP-24-MaS50



Notes:
The chart mean excludes values outside of a bias range of ± 30%.
The chart shows only data points with values between 11.8 and 34.4 (± 5 Standard Deviations).
The error bars encompassing each result are plotted at ± one standard deviation.

Cadmium

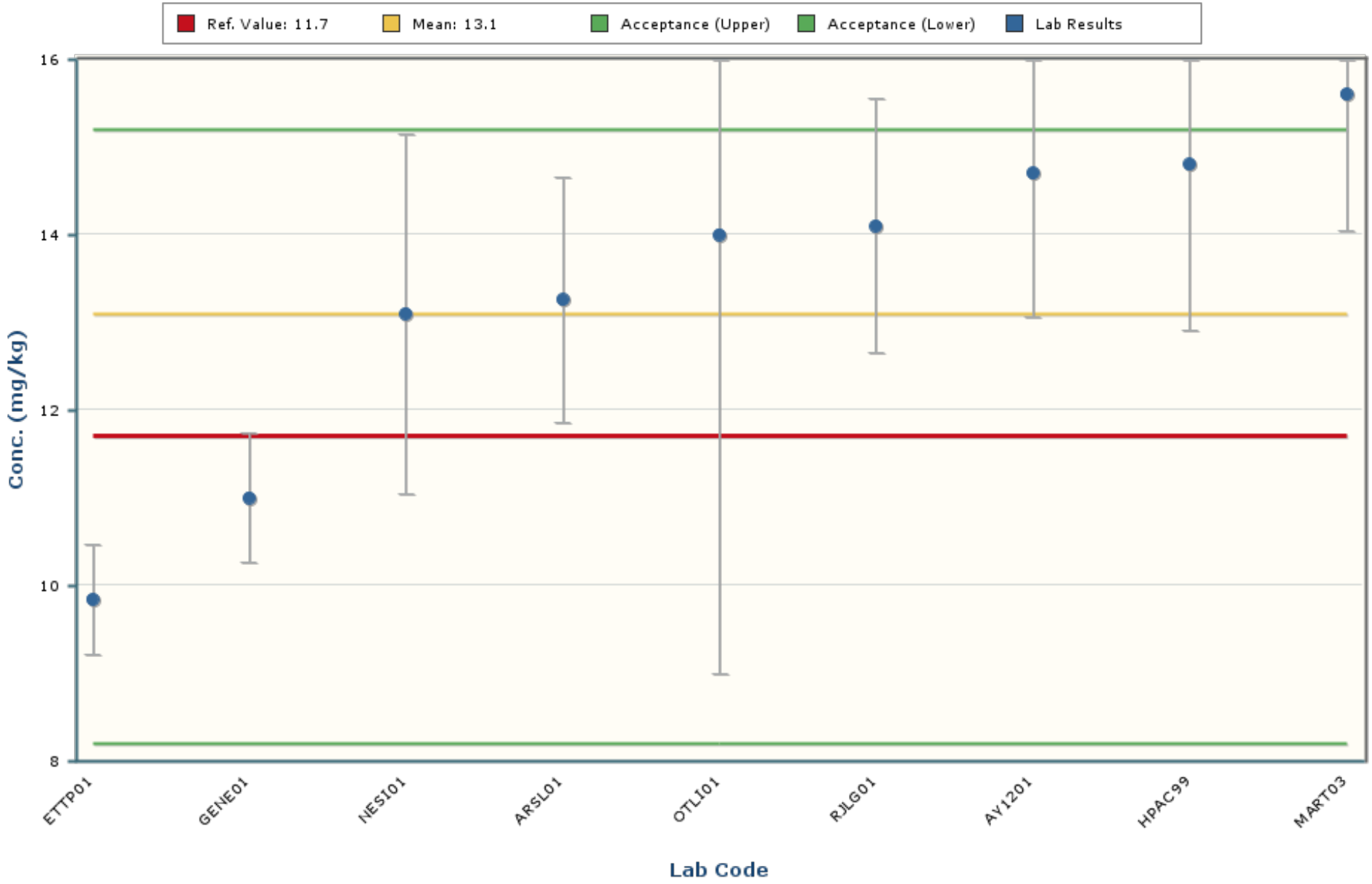
MAPEP-24-MaS50



Notes:
The chart mean excludes values outside of a bias range of ± 30%.
The chart shows only data points with values between 3.24 and 6.36 (± 5 Standard Deviations).
The error bars encompassing each result are plotted at ± one standard deviation.

Chromium

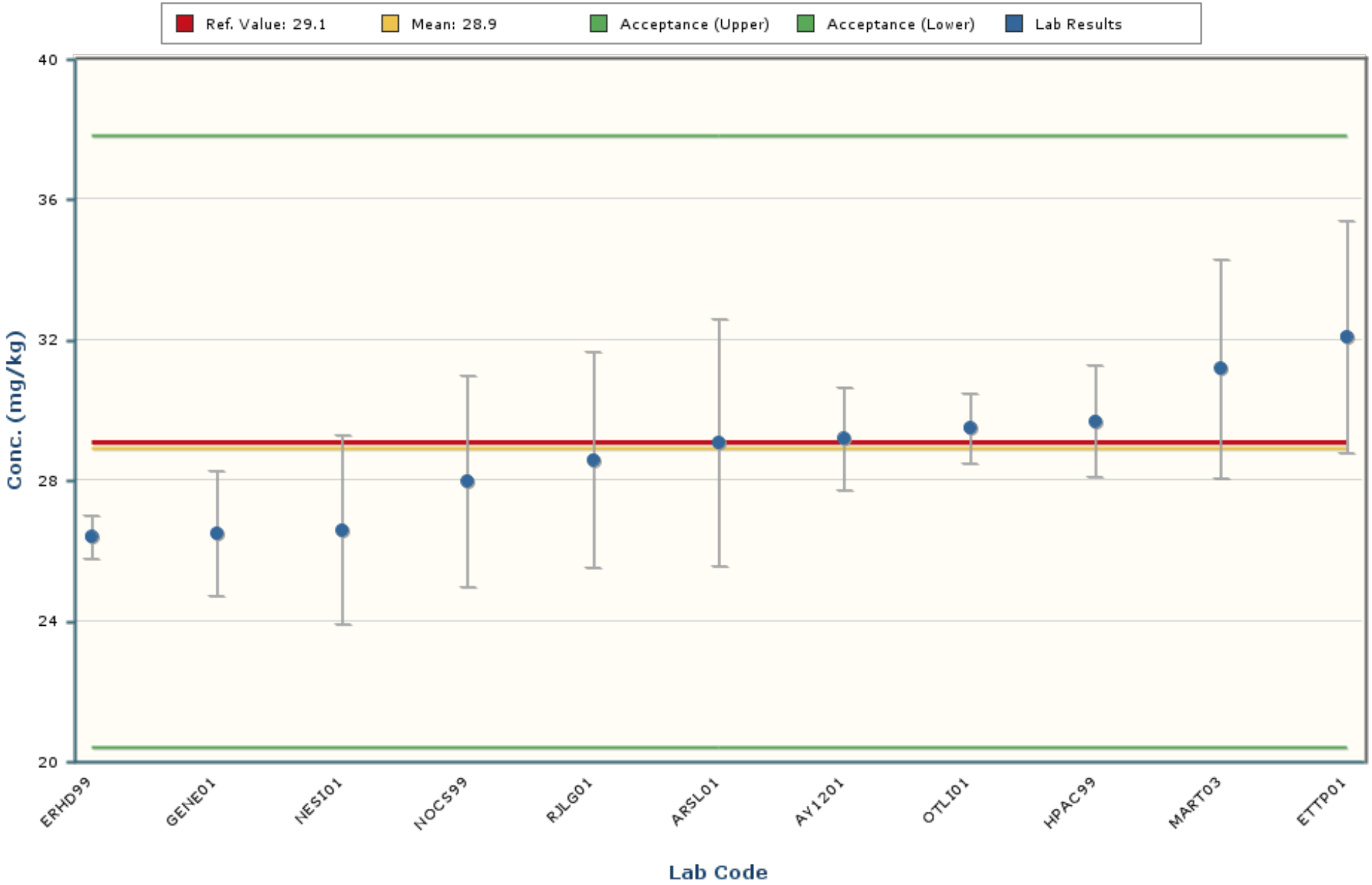
MAPEP-24-MaS50



Notes:
The chart mean excludes values outside of a bias range of ± 30%.
The chart shows only data points with values between 4.2 and 22.0 (± 5 Standard Deviations).
The error bars encompassing each result are plotted at ± one standard deviation.

Cobalt

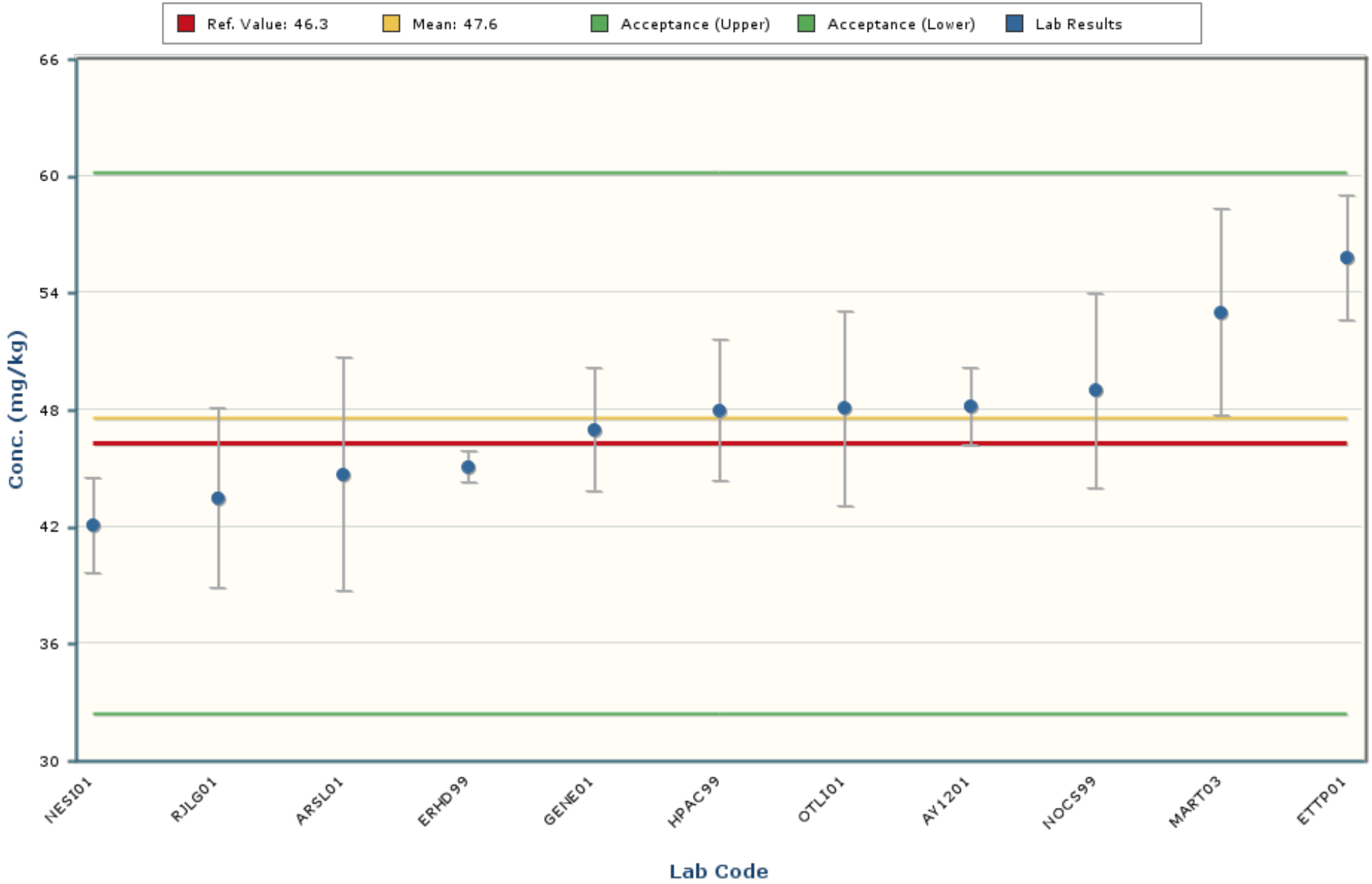
MAPEP-24-MaS50



Notes:
The chart mean excludes values outside of a bias range of ± 30%.
The chart shows only data points with values between 19.2 and 38.6 (± 5 Standard Deviations).
The error bars encompassing each result are plotted at ± one standard deviation.

Copper

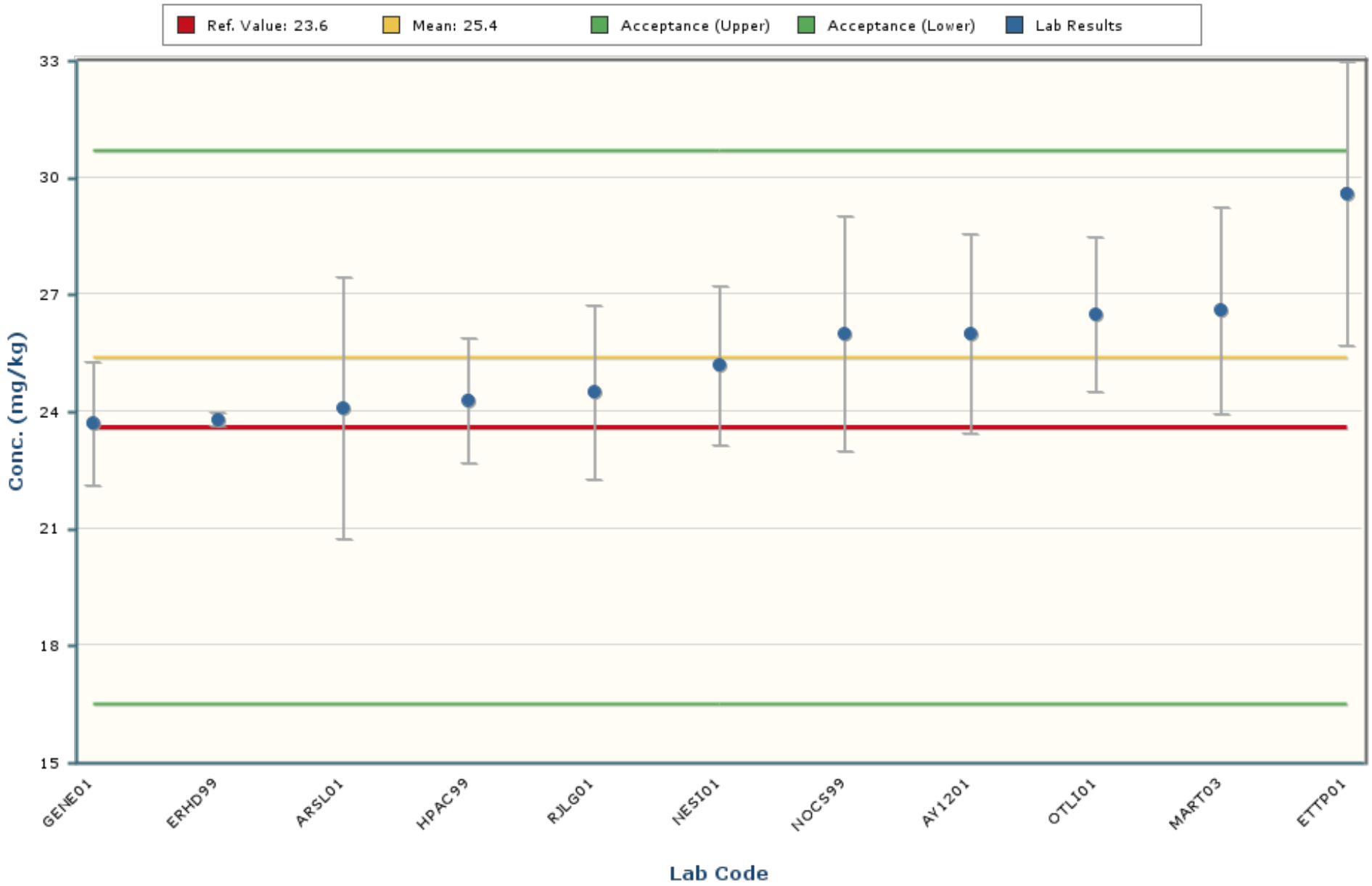
MAPEP-24-MaS50



Notes:
The chart mean excludes values outside of a bias range of ± 30%.
The chart shows only data points with values between 26.5 and 68.6 (± 5 Standard Deviations).
The error bars encompassing each result are plotted at ± one standard deviation.

Lead

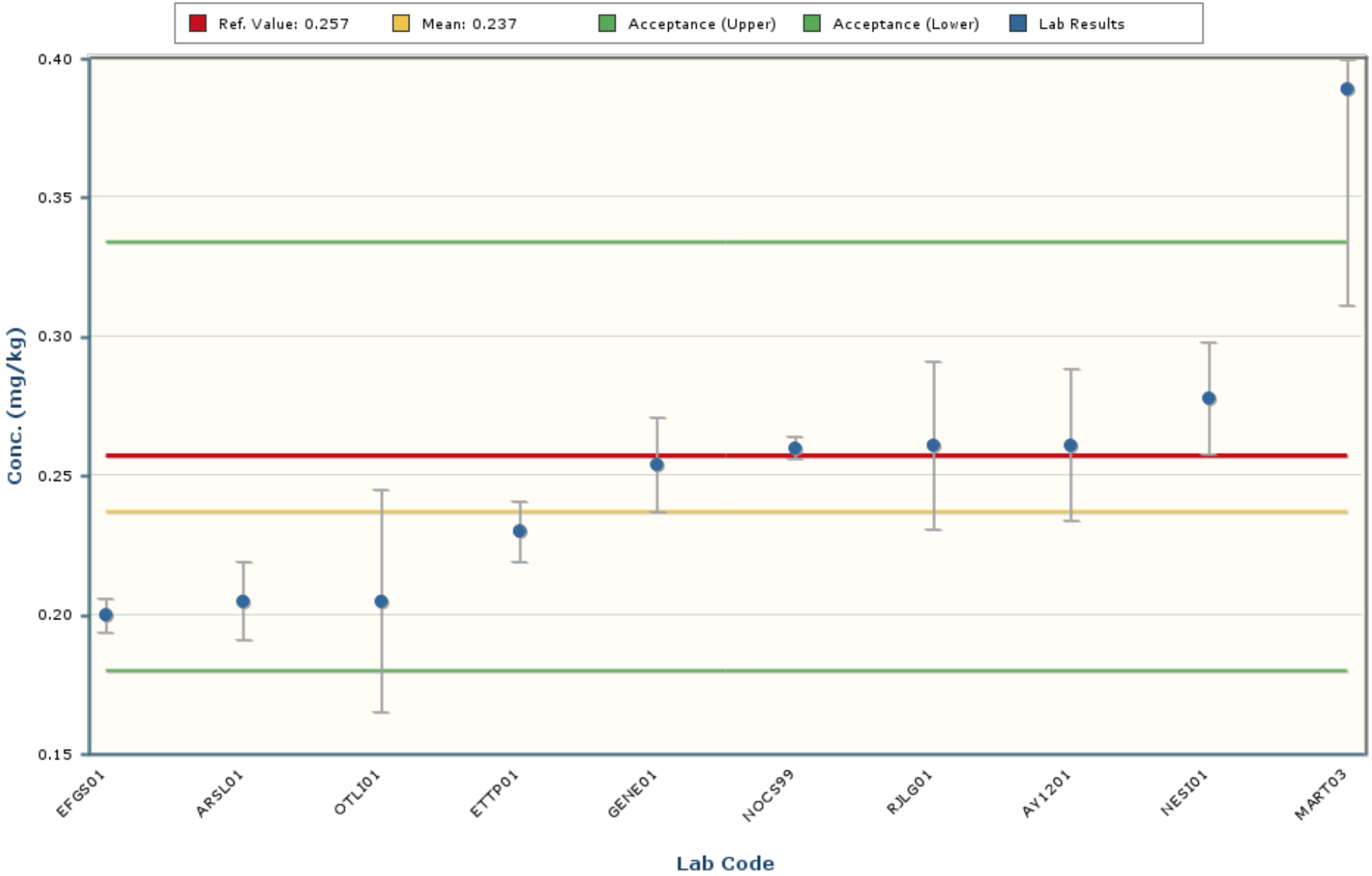
MAPEP-24-MaS50



Notes:
The chart mean excludes values outside of a bias range of ± 30%.
The chart shows only data points with values between 16.3 and 34.5 (± 5 Standard Deviations).
The error bars encompassing each result are plotted at ± one standard deviation.

Mercury

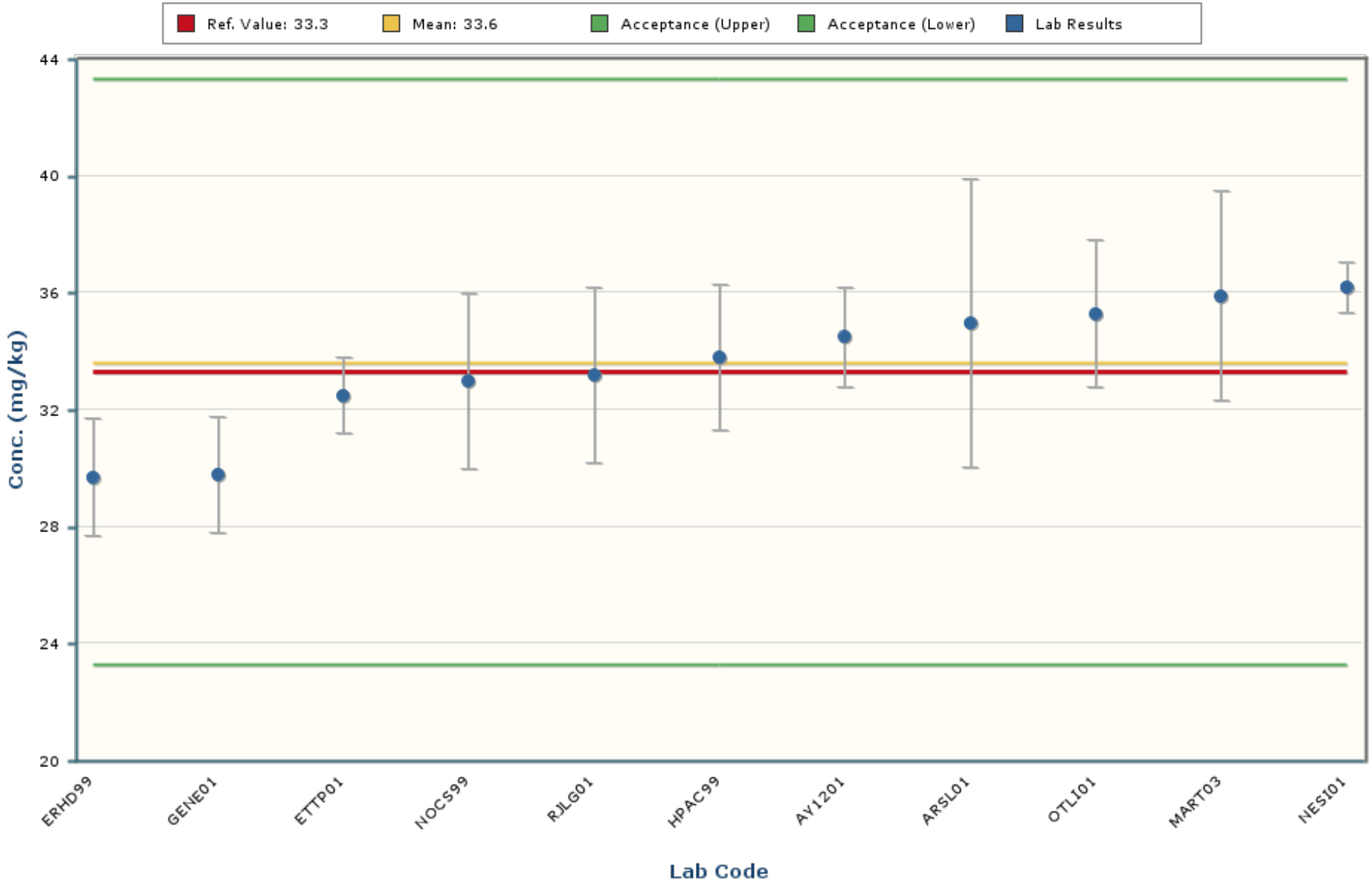
MAPEP-24-MaS50



Notes:
The chart mean excludes values outside of a bias range of ± 30%.
The chart shows only data points with values between 0.083 and 0.390 (± 5 Standard Deviations).
The error bars encompassing each result are plotted at ± one standard deviation.

Nickel

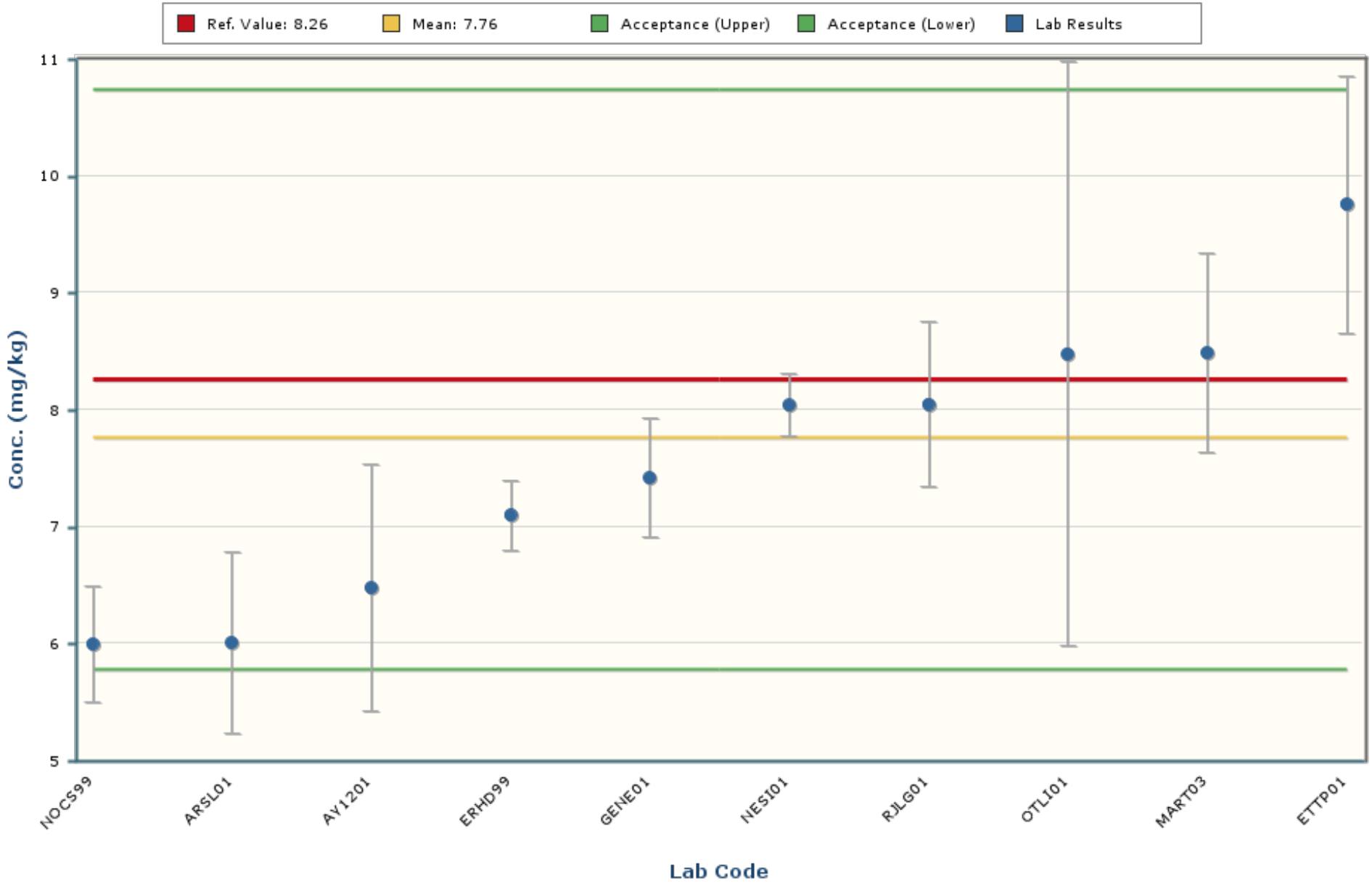
MAPEP-24-MaS50



Notes:
The chart mean excludes values outside of a bias range of ± 30%.
The chart shows only data points with values between 22.0 and 45.2 (± 5 Standard Deviations).
The error bars encompassing each result are plotted at ± one standard deviation.

Selenium

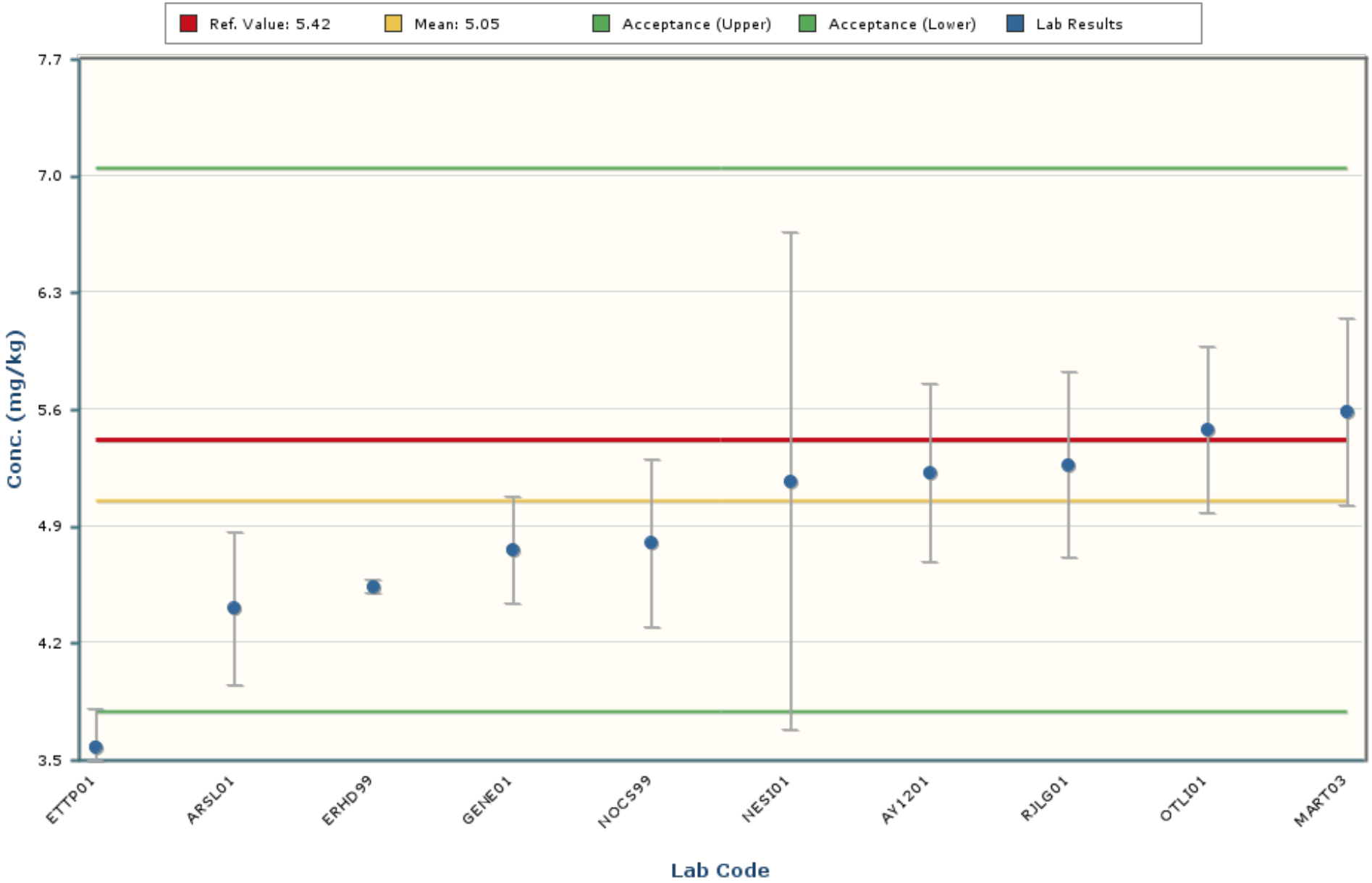
MAPEP-24-MaS50



Notes:
The chart mean excludes values outside of a bias range of ± 30%.
The chart shows only data points with values between 2.04 and 13.48 (± 5 Standard Deviations).
The error bars encompassing each result are plotted at ± one standard deviation.

Silver

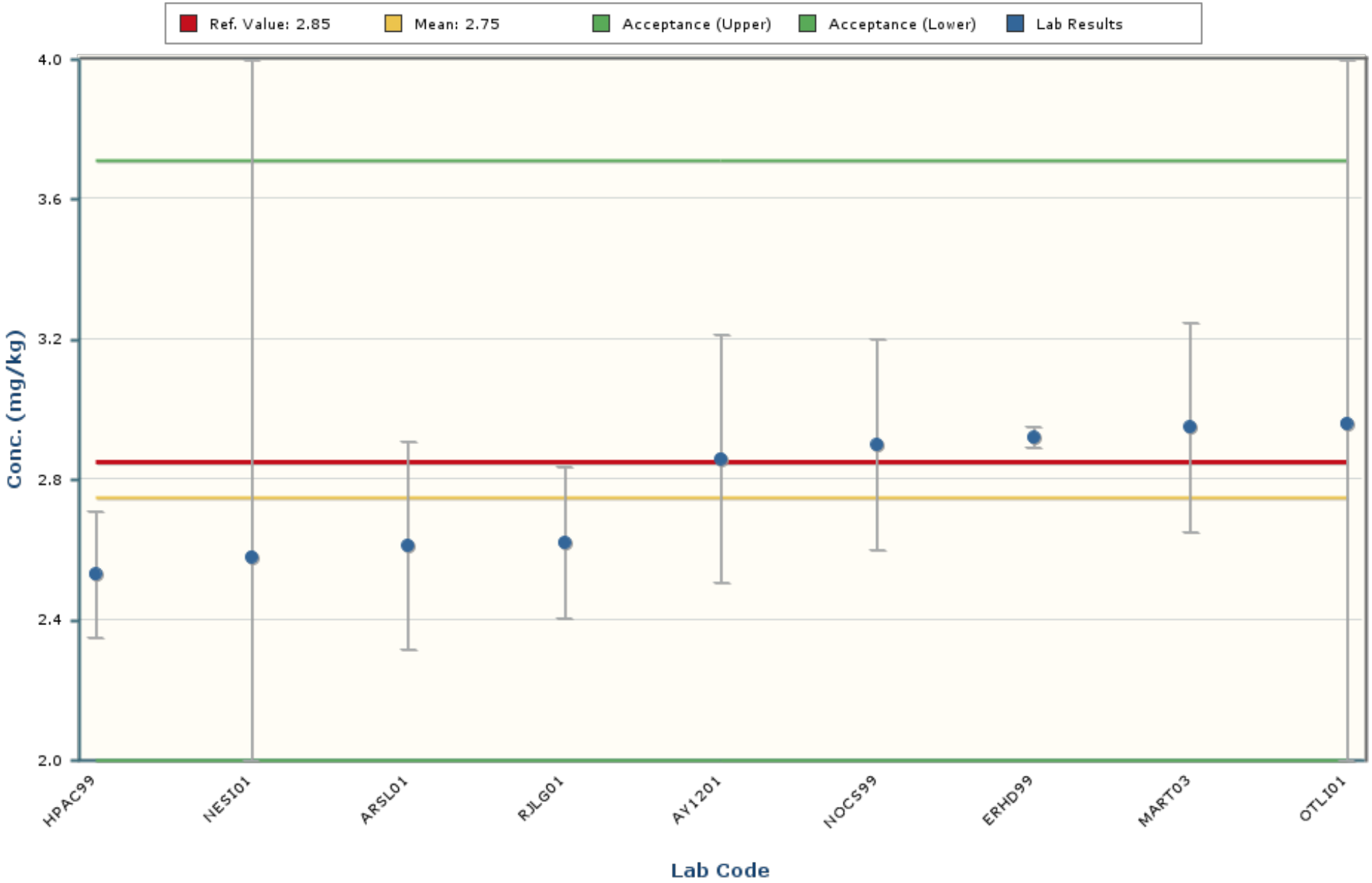
MAPEP-24-MaS50



Notes:
The chart mean excludes values outside of a bias range of ± 30%.
The chart shows only data points with values between 2.88 and 7.23 (± 5 Standard Deviations).
The error bars encompassing each result are plotted at ± one standard deviation.

Thallium

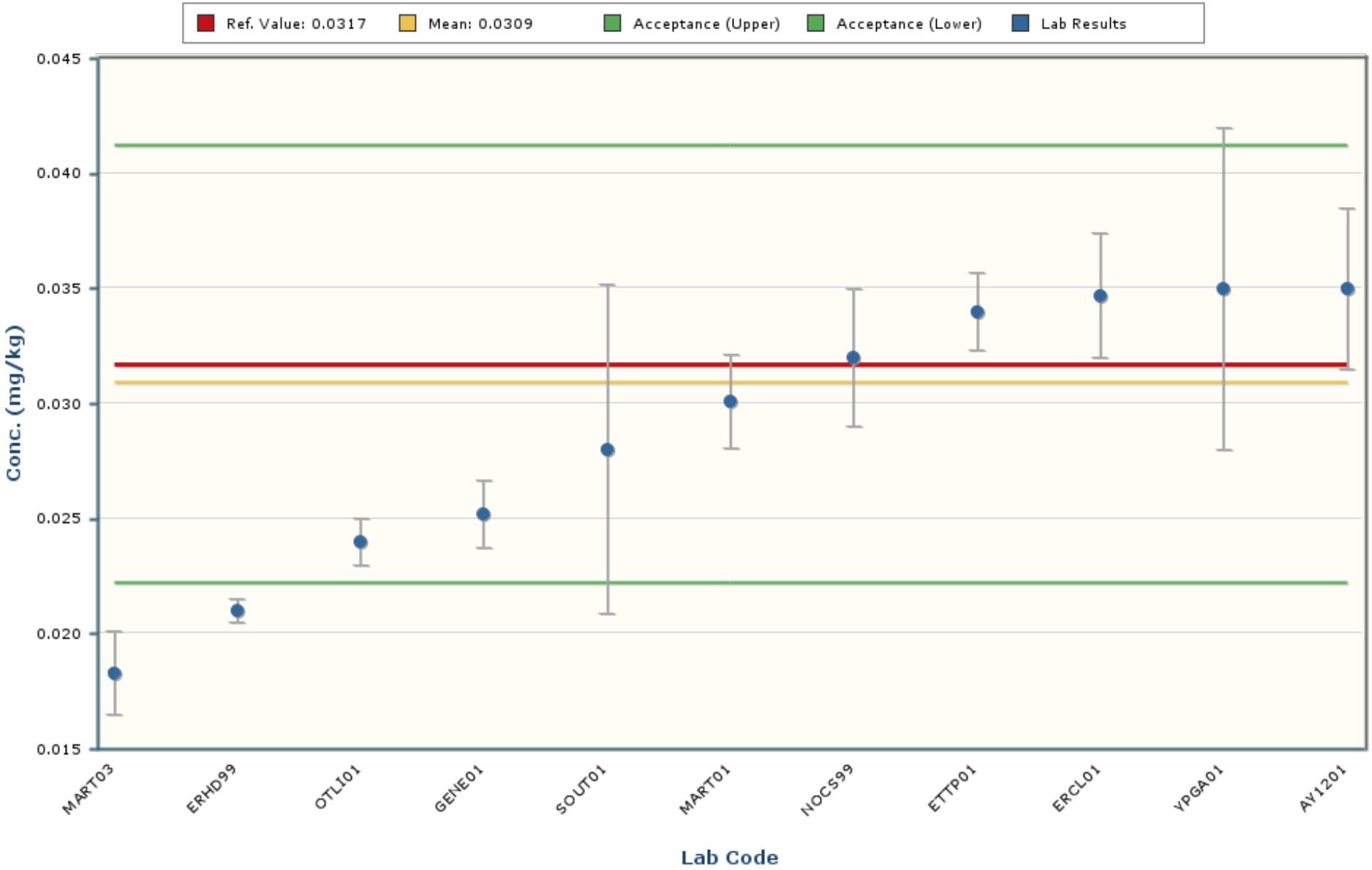
MAPEP-24-MaS50



Notes:
The chart mean excludes values outside of a bias range of ± 30%.
The chart shows only data points with values between 1.83 and 3.68 (± 5 Standard Deviations).
The error bars encompassing each result are plotted at ± one standard deviation.

Uranium-235

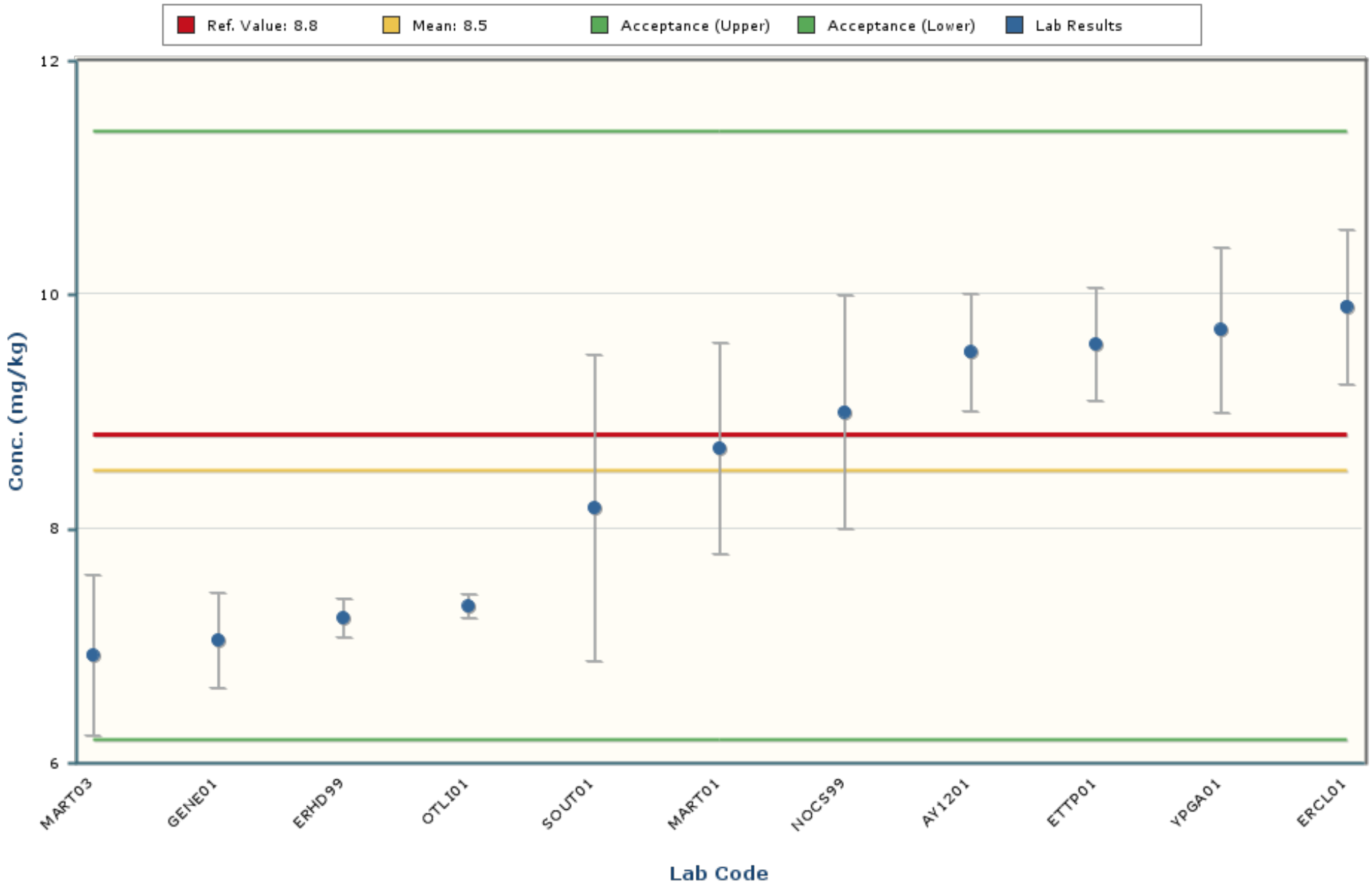
MAPEP-24-MaS50



Notes:
The chart mean excludes values outside of a bias range of ± 30%.
The chart shows only data points with values between 0.0094 and 0.0524 (± 5 Standard Deviations).
The error bars encompassing each result are plotted at ± one standard deviation.

Uranium-238

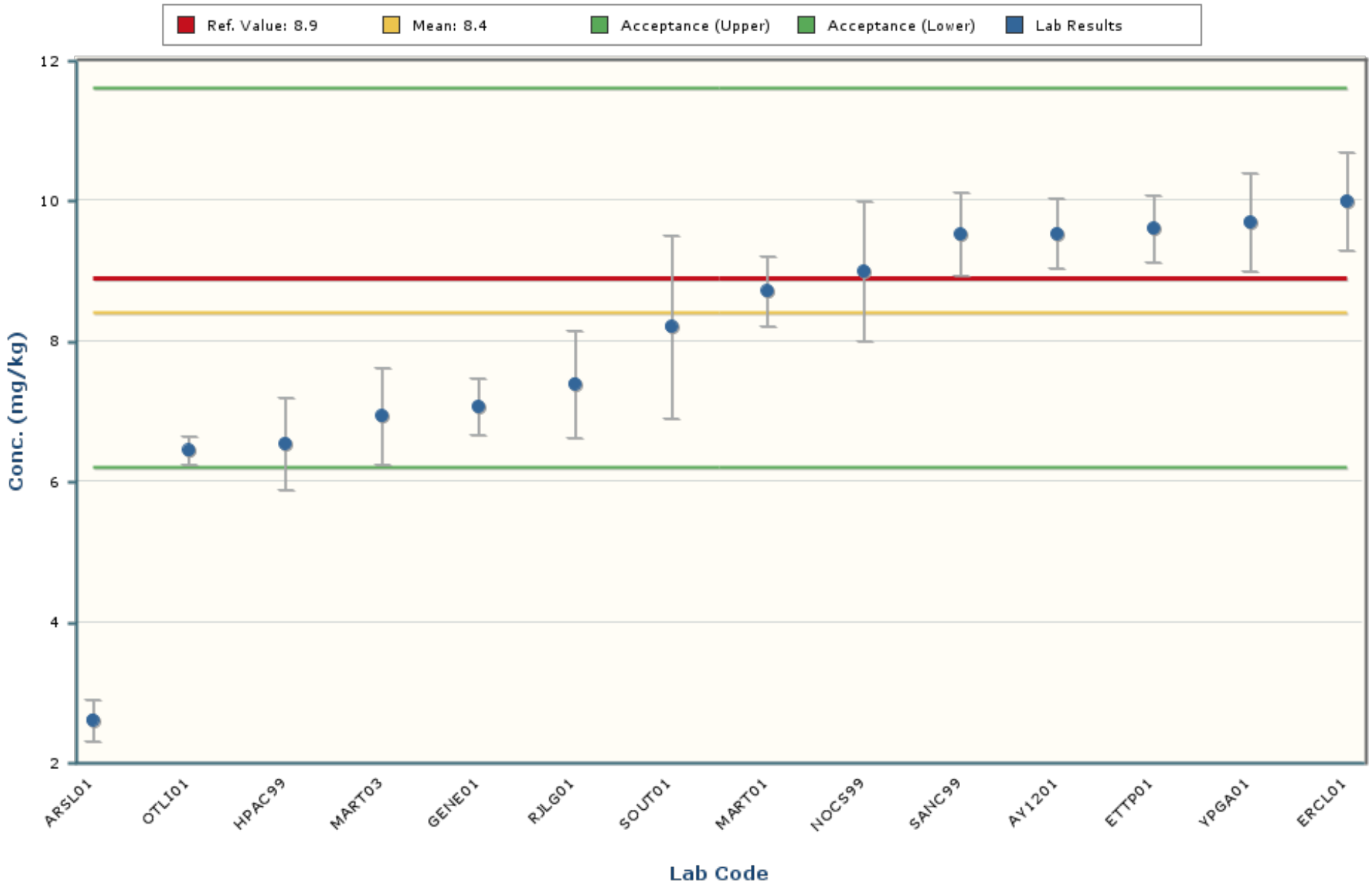
MAPEP-24-MaS50



Notes:
The chart mean excludes values outside of a bias range of ± 30%.
The chart shows only data points with values between 2.7 and 14.3 (± 5 Standard Deviations).
The error bars encompassing each result are plotted at ± one standard deviation.

Uranium-Total

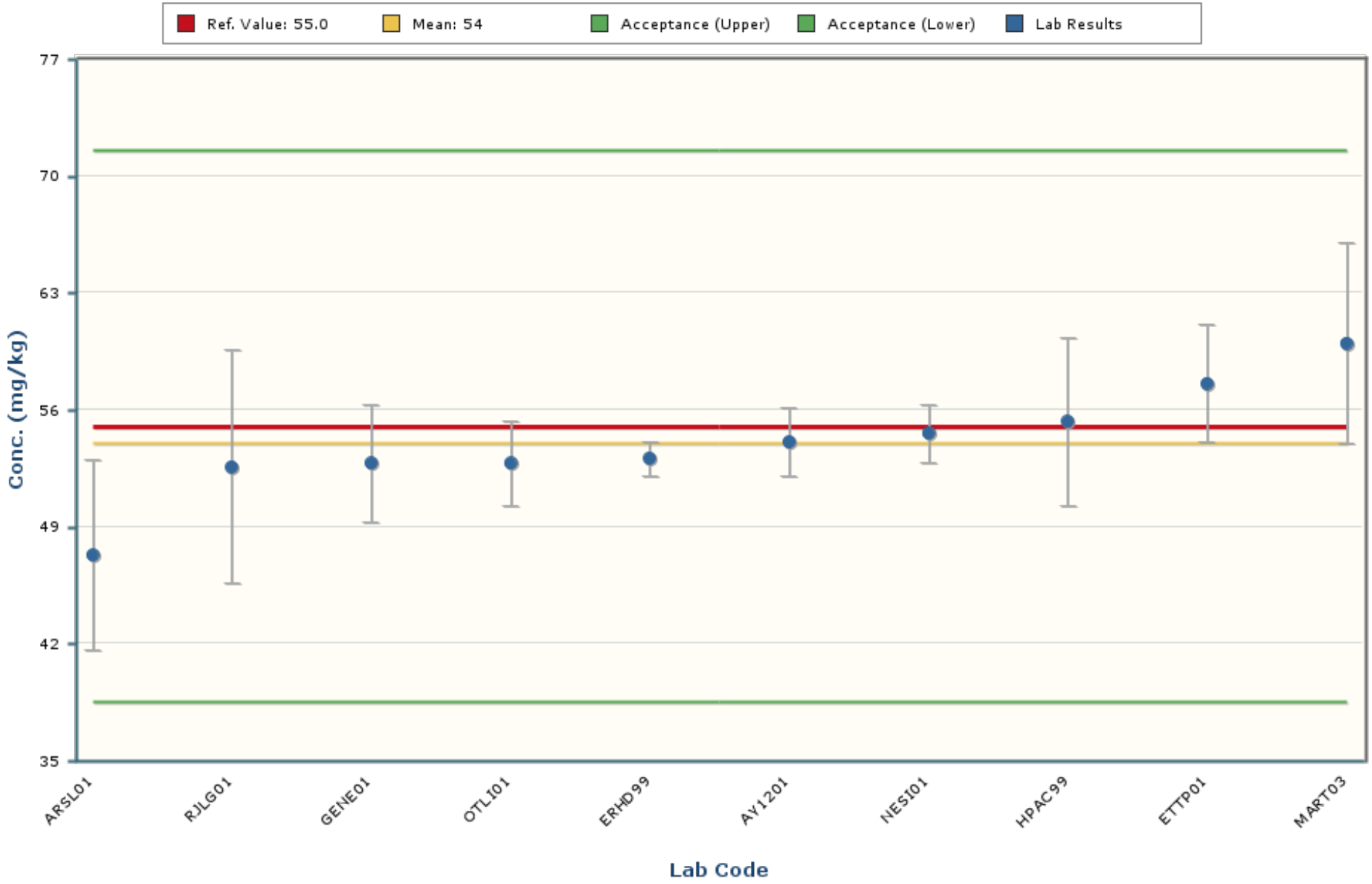
MAPEP-24-MaS50



Notes:
The chart mean excludes values outside of a bias range of ± 30%.
The chart shows only data points with values between 1.8 and 15.0 (± 5 Standard Deviations).
The error bars encompassing each result are plotted at ± one standard deviation.

Vanadium

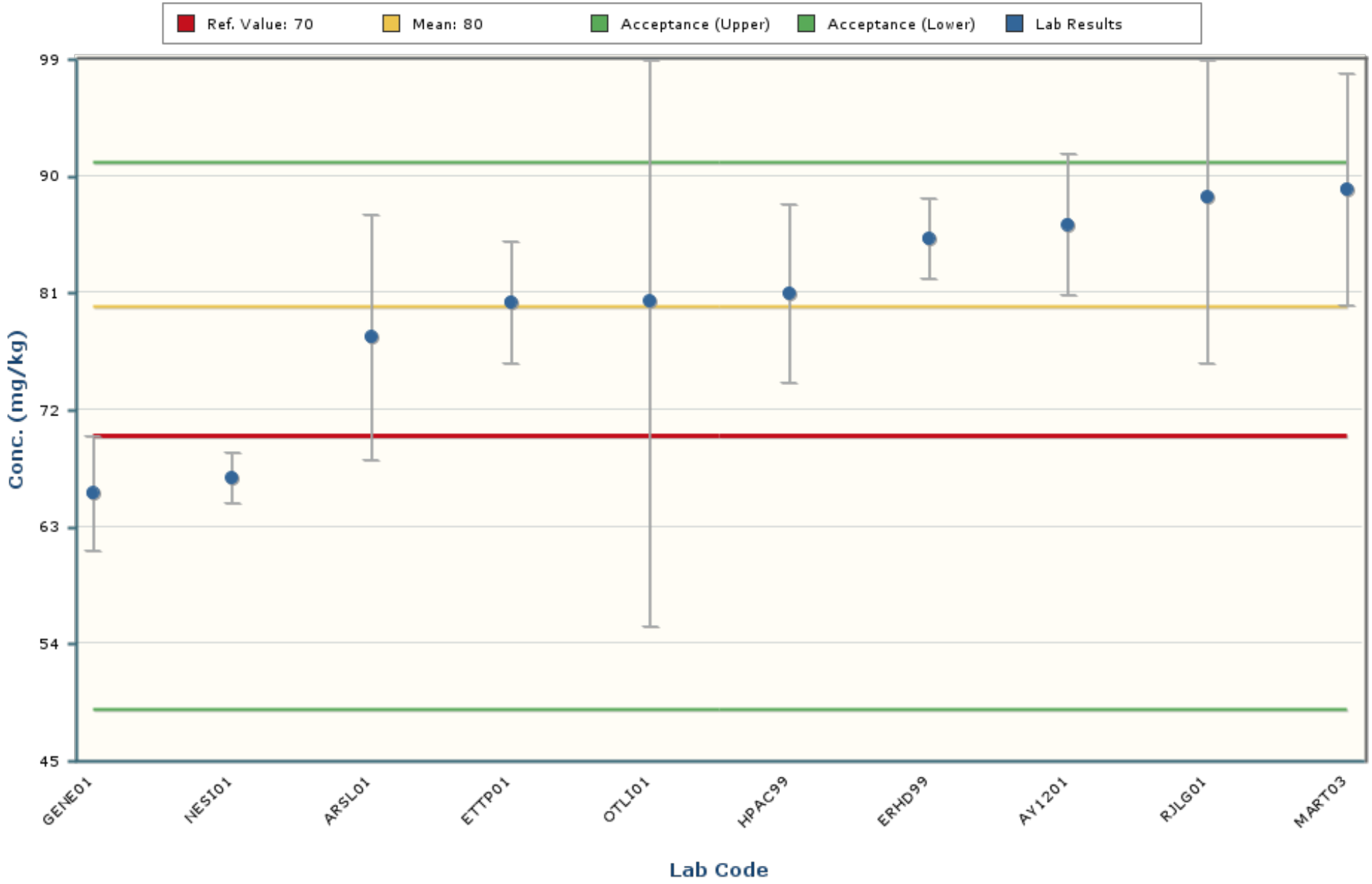
MAPEP-24-MaS50



Notes:
The chart mean excludes values outside of a bias range of ± 30%.
The chart shows only data points with values between 37.2 and 70.8 (± 5 Standard Deviations).
The error bars encompassing each result are plotted at ± one standard deviation.

Zinc

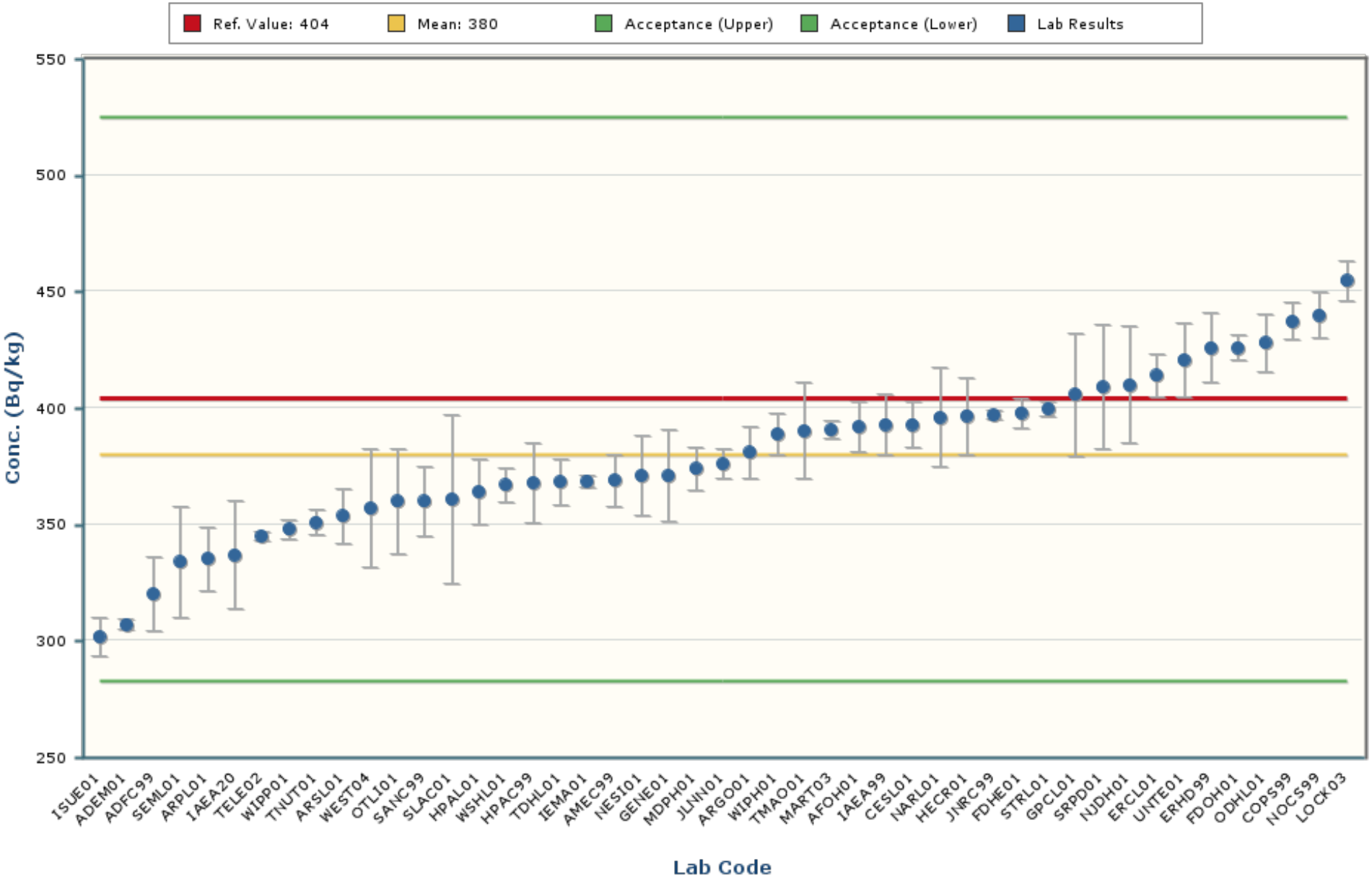
MAPEP-24-MaS50



Notes:
The chart mean excludes values outside of a bias range of ± 30%.
The chart shows only data points with values between 39 and 121 (± 5 Standard Deviations).
The error bars encompassing each result are plotted at ± one standard deviation.

Cesium-134

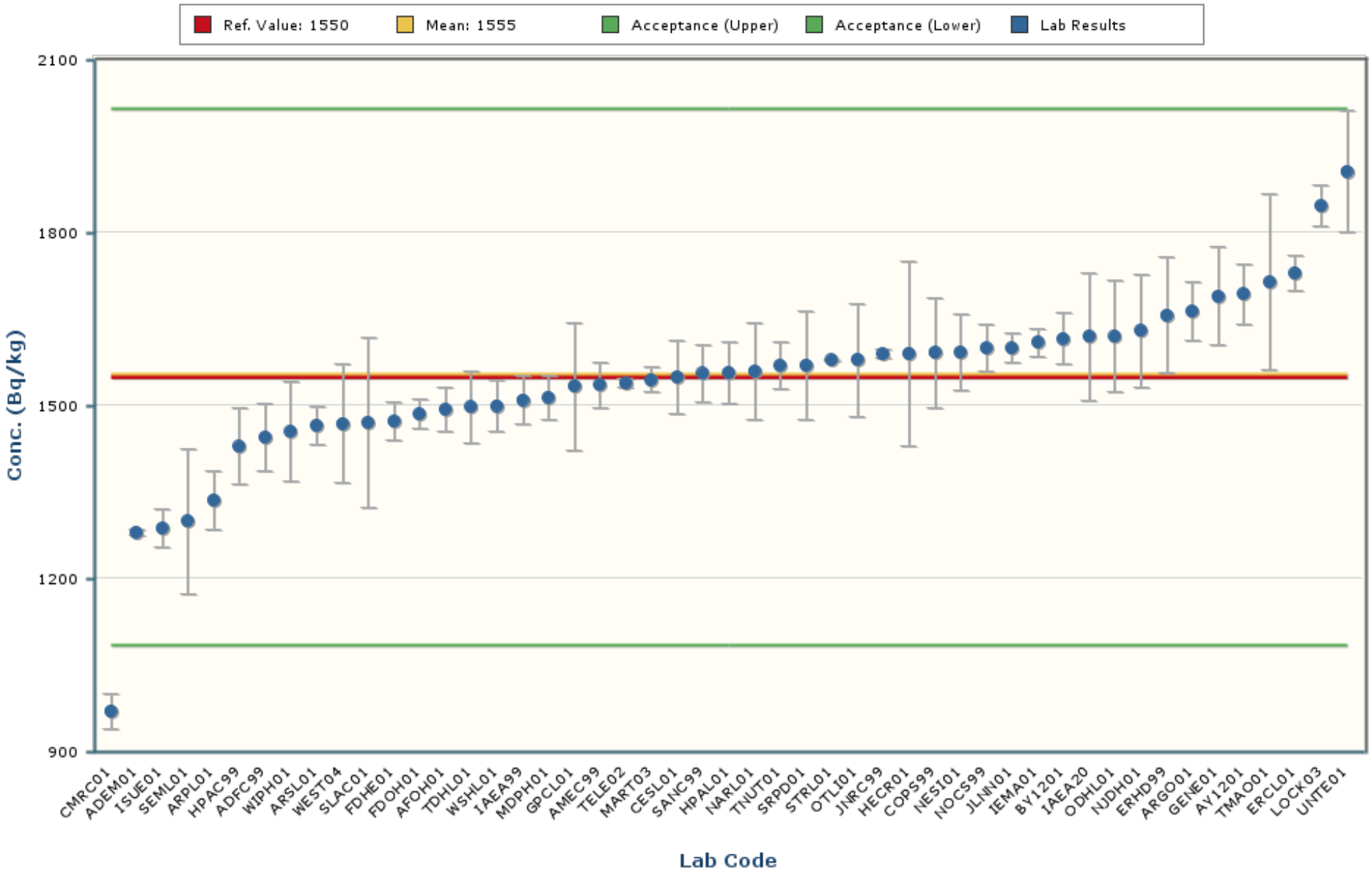
MAPEP-24-MaS50



Notes:
The chart mean excludes values outside of a bias range of ± 30%.
The chart shows only data points with values between 208 and 551 (± 5 Standard Deviations).
The error bars encompassing each result are plotted at ± one standard deviation.

Cesium-137

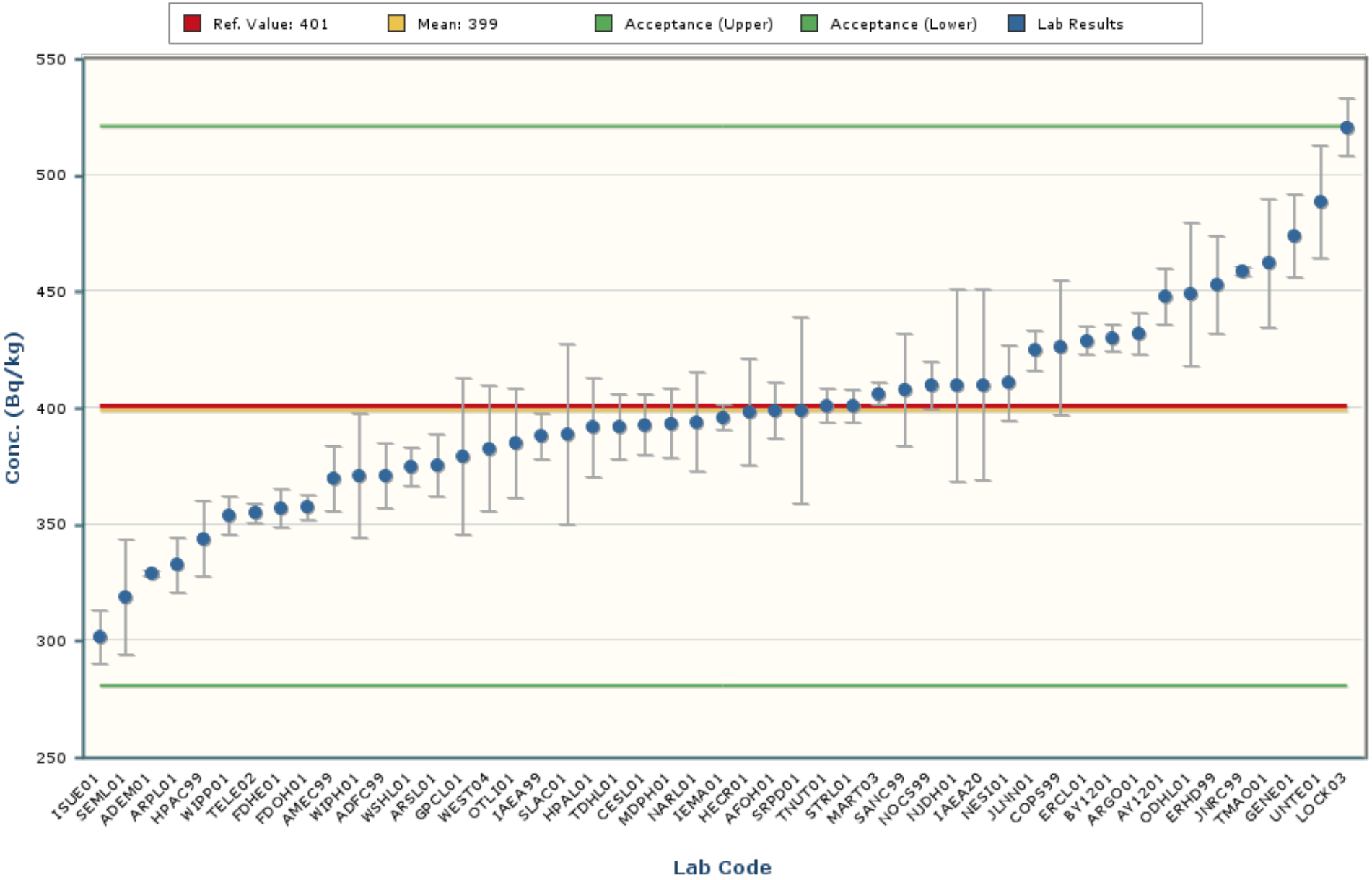
MAPEP-24-MaS50



Notes:
The chart mean excludes values outside of a bias range of ± 30%.
The chart shows only data points with values between 944 and 2167 (± 5 Standard Deviations).
The error bars encompassing each result are plotted at ± one standard deviation.

Cobalt-57

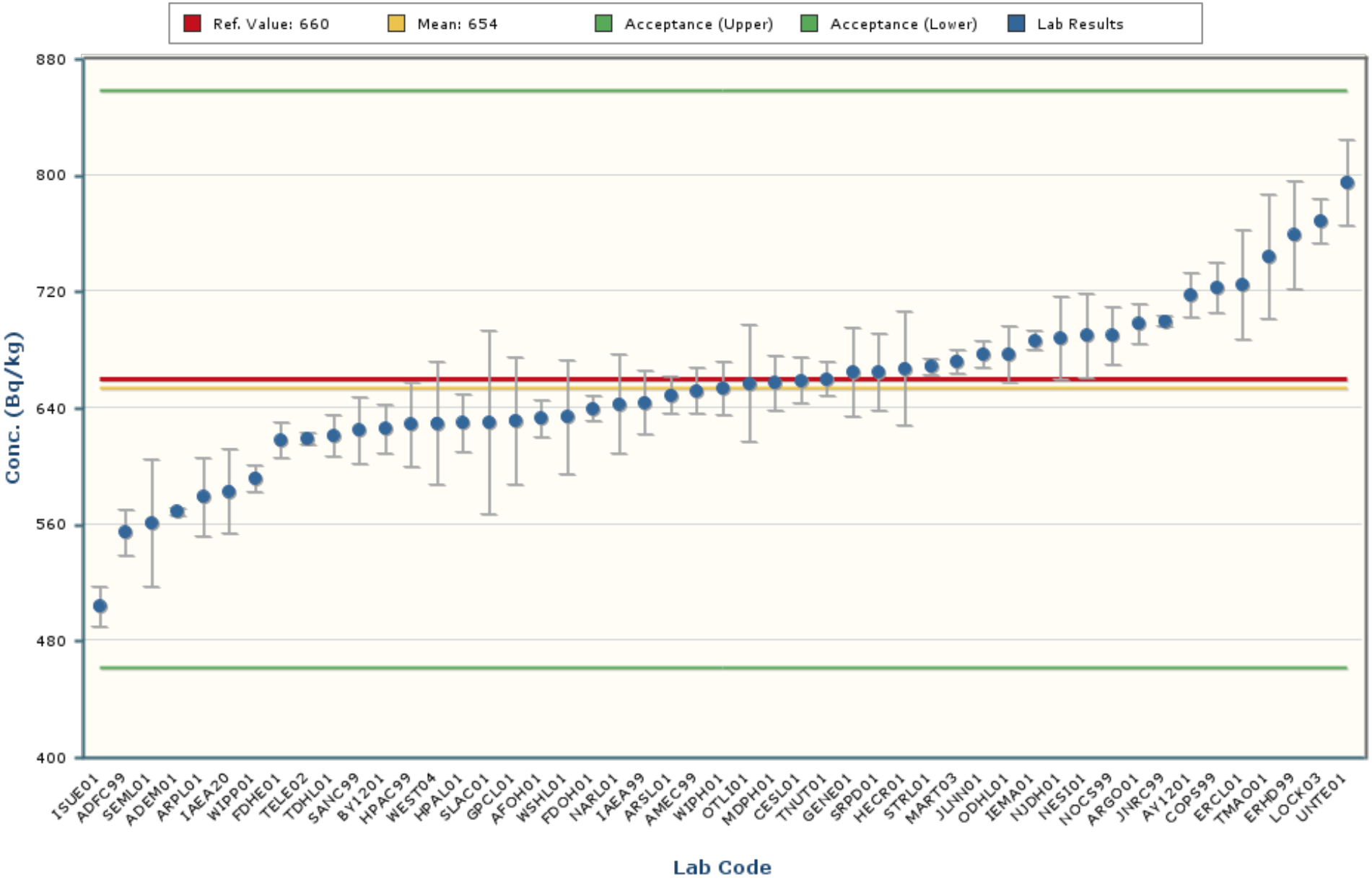
MAPEP-24-MaS50



Notes:
The chart mean excludes values outside of a bias range of ± 30%.
The chart shows only data points with values between 183 and 615 (± 5 Standard Deviations).
The error bars encompassing each result are plotted at ± one standard deviation.

Cobalt-60

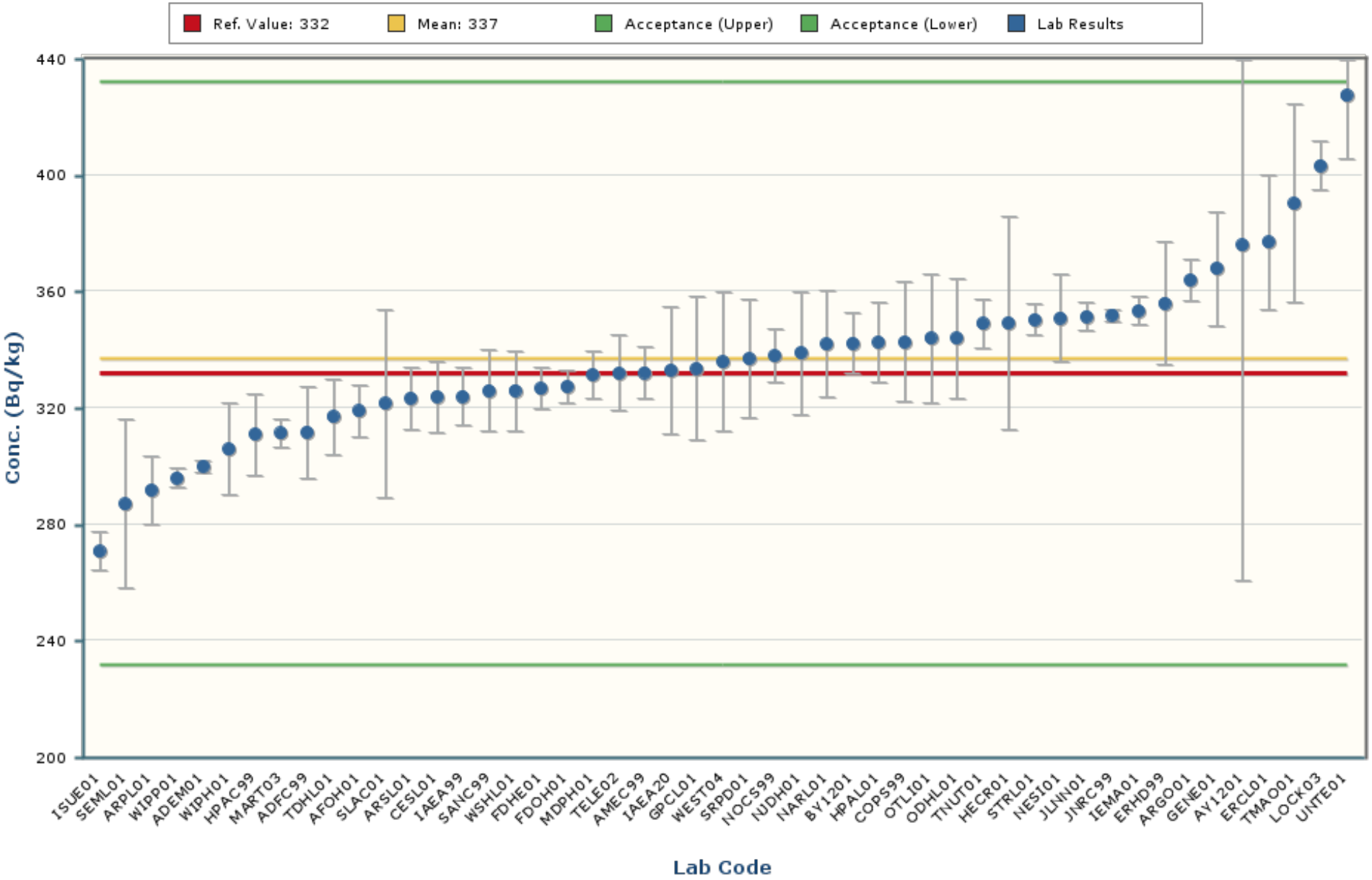
MAPEP-24-MaS50



Notes:
The chart mean excludes values outside of a bias range of ± 30%.
The chart shows only data points with values between 376 and 933 (± 5 Standard Deviations).
The error bars encompassing each result are plotted at ± one standard deviation.

Manganese-54

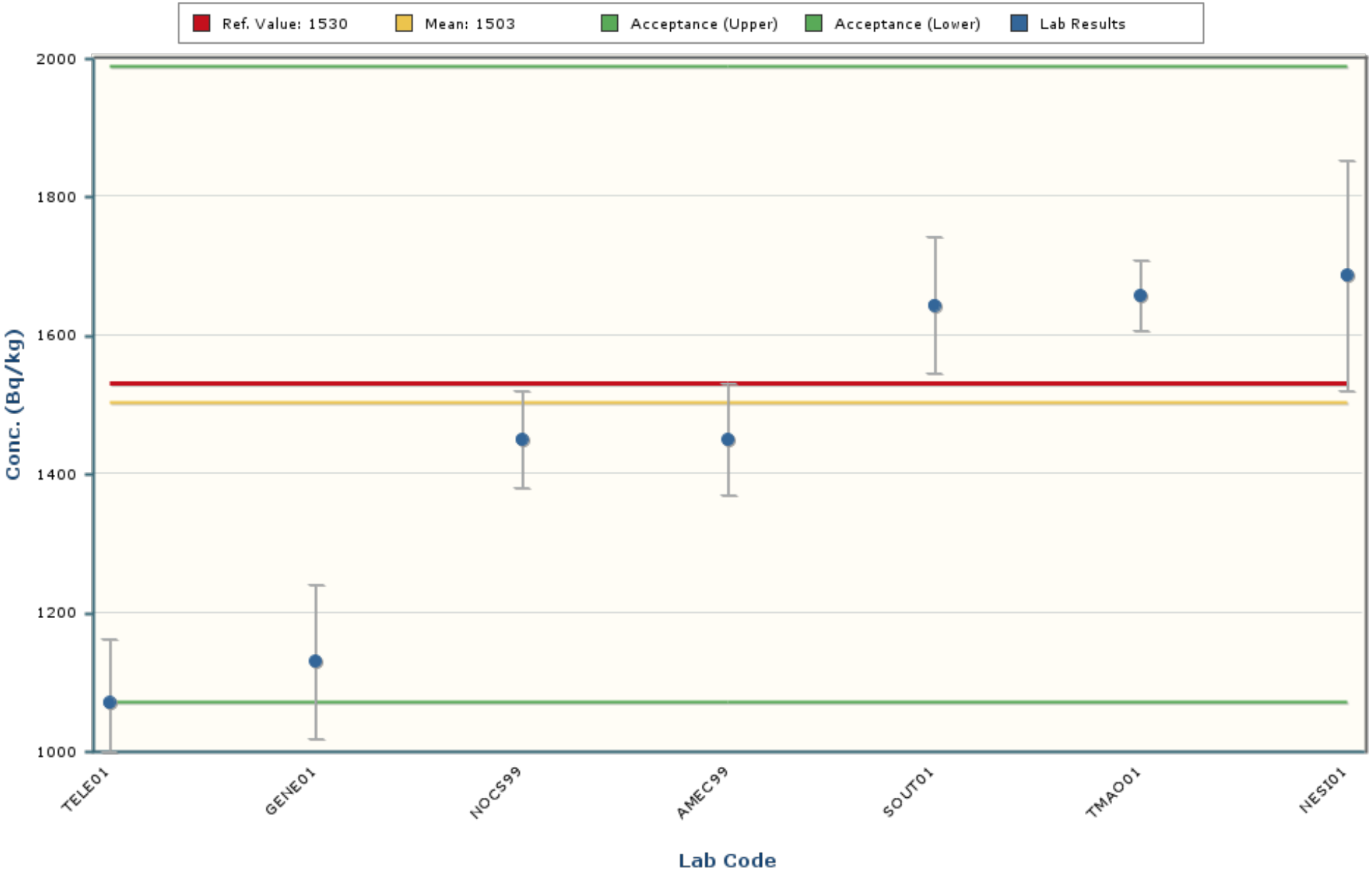
MAPEP-24-MaS50



Notes:
The chart mean excludes values outside of a bias range of ± 30%.
The chart shows only data points with values between 194 and 480 (± 5 Standard Deviations).
The error bars encompassing each result are plotted at ± one standard deviation.

Nickel-63

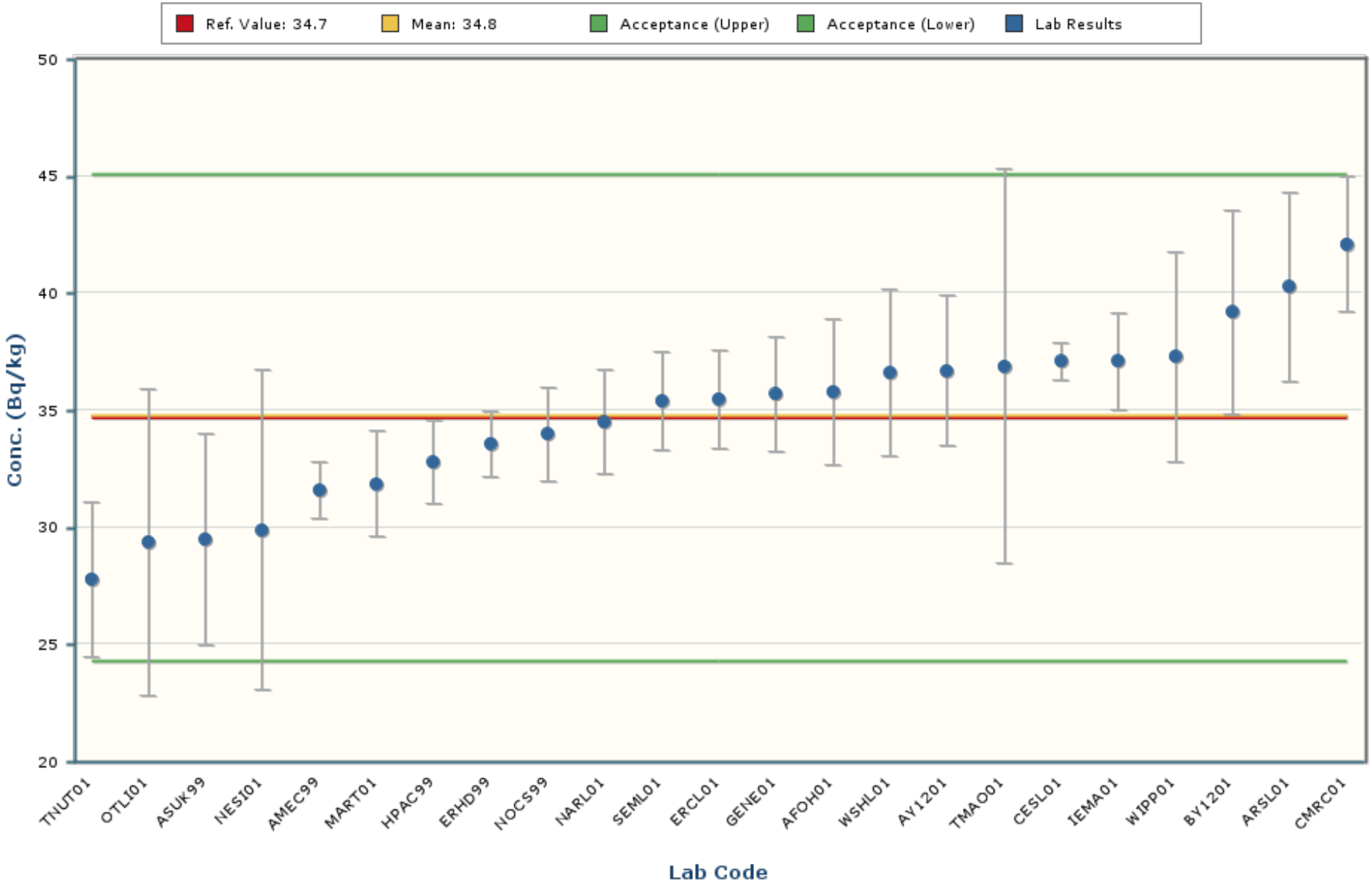
MAPEP-24-MaS50



Notes:
The chart mean excludes values outside of a bias range of ± 30%.
The chart shows only data points with values between 448 and 2558 (± 5 Standard Deviations).
The error bars encompassing each result are plotted at ± one standard deviation.

Plutonium-238

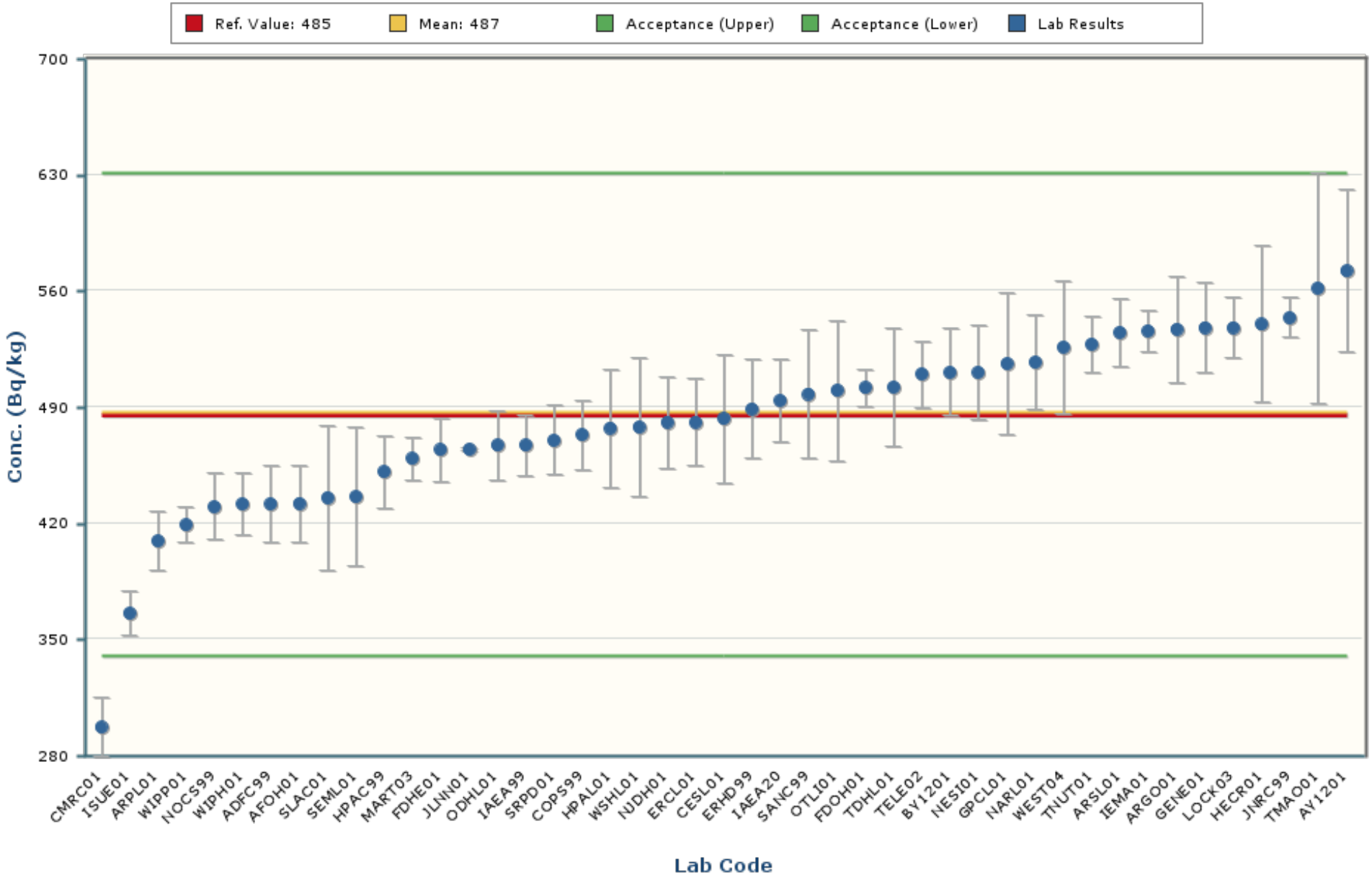
MAPEP-24-MaS50



Notes:
The chart mean excludes values outside of a bias range of ± 30%.
The chart shows only data points with values between 16.7 and 52.9 (± 5 Standard Deviations).
The error bars encompassing each result are plotted at ± one standard deviation.

Potassium-40

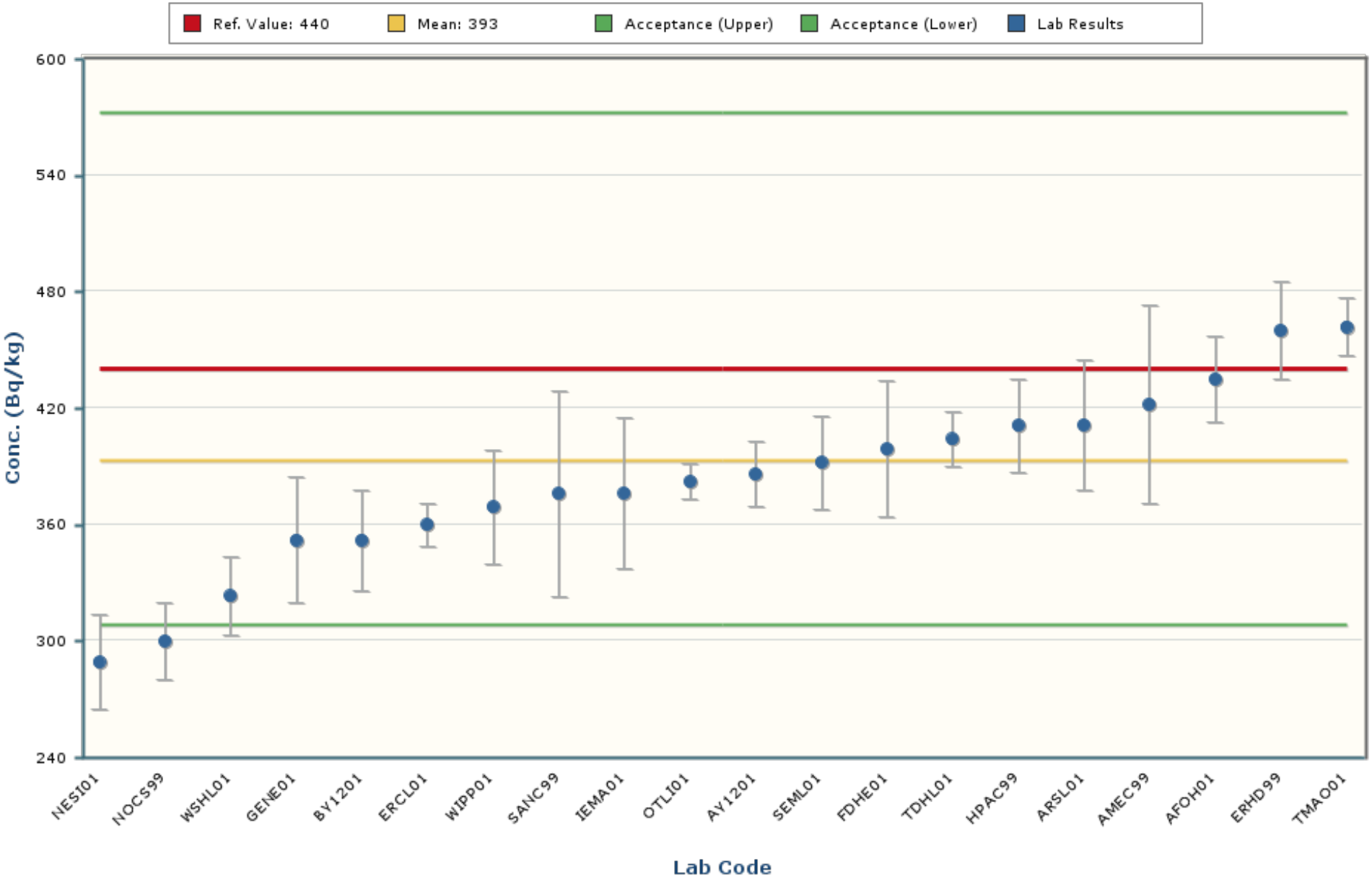
MAPEP-24-MaS50



Notes:
The chart mean excludes values outside of a bias range of ± 30%.
The chart shows only data points with values between 263 and 711 (± 5 Standard Deviations).
The error bars encompassing each result are plotted at ± one standard deviation.

Strontium-90

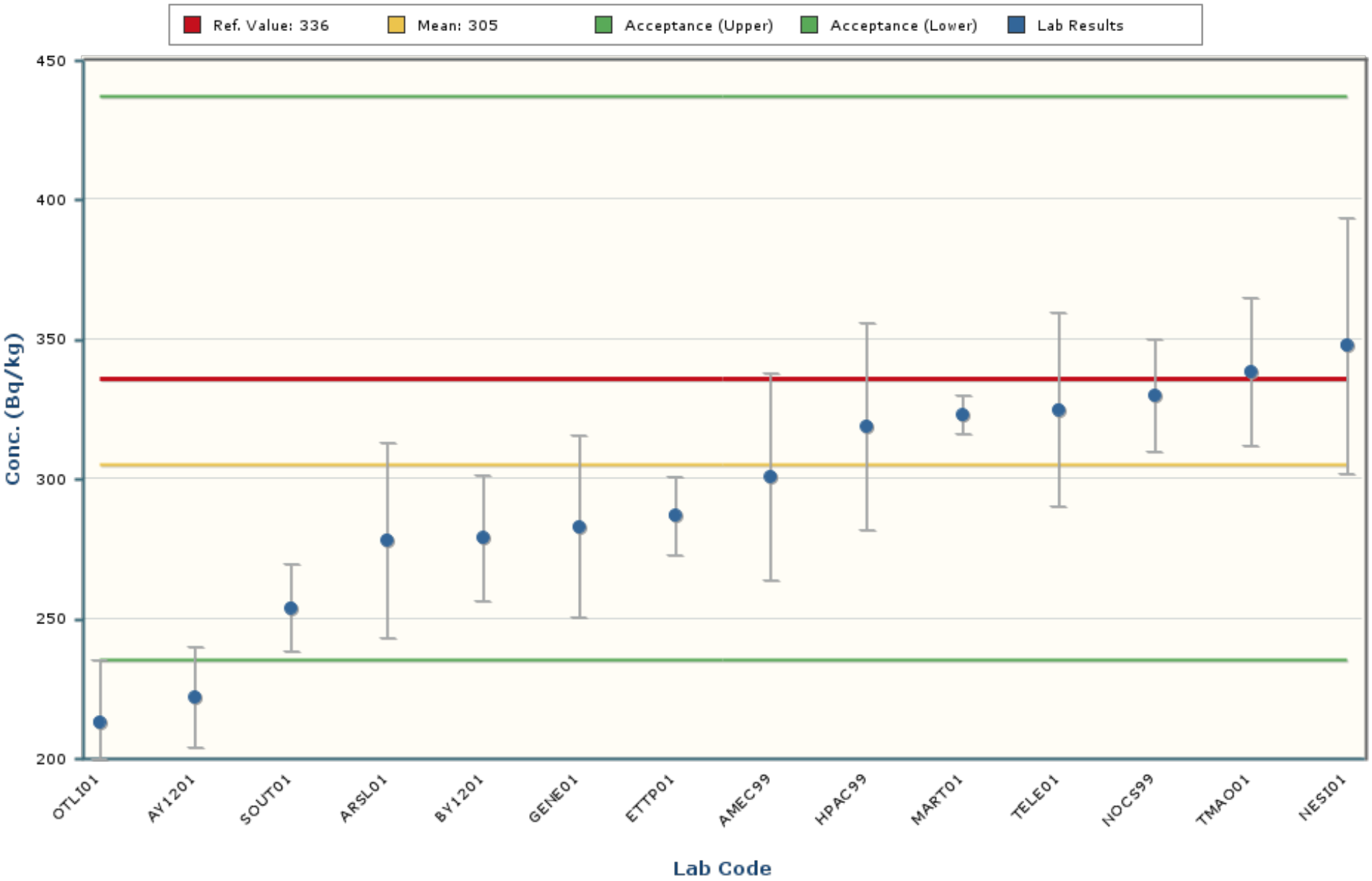
MAPEP-24-MaS50



Notes:
The chart mean excludes values outside of a bias range of ± 30%.
The chart shows only data points with values between 208 and 578 (± 5 Standard Deviations).
The error bars encompassing each result are plotted at ± one standard deviation.

Technetium-99

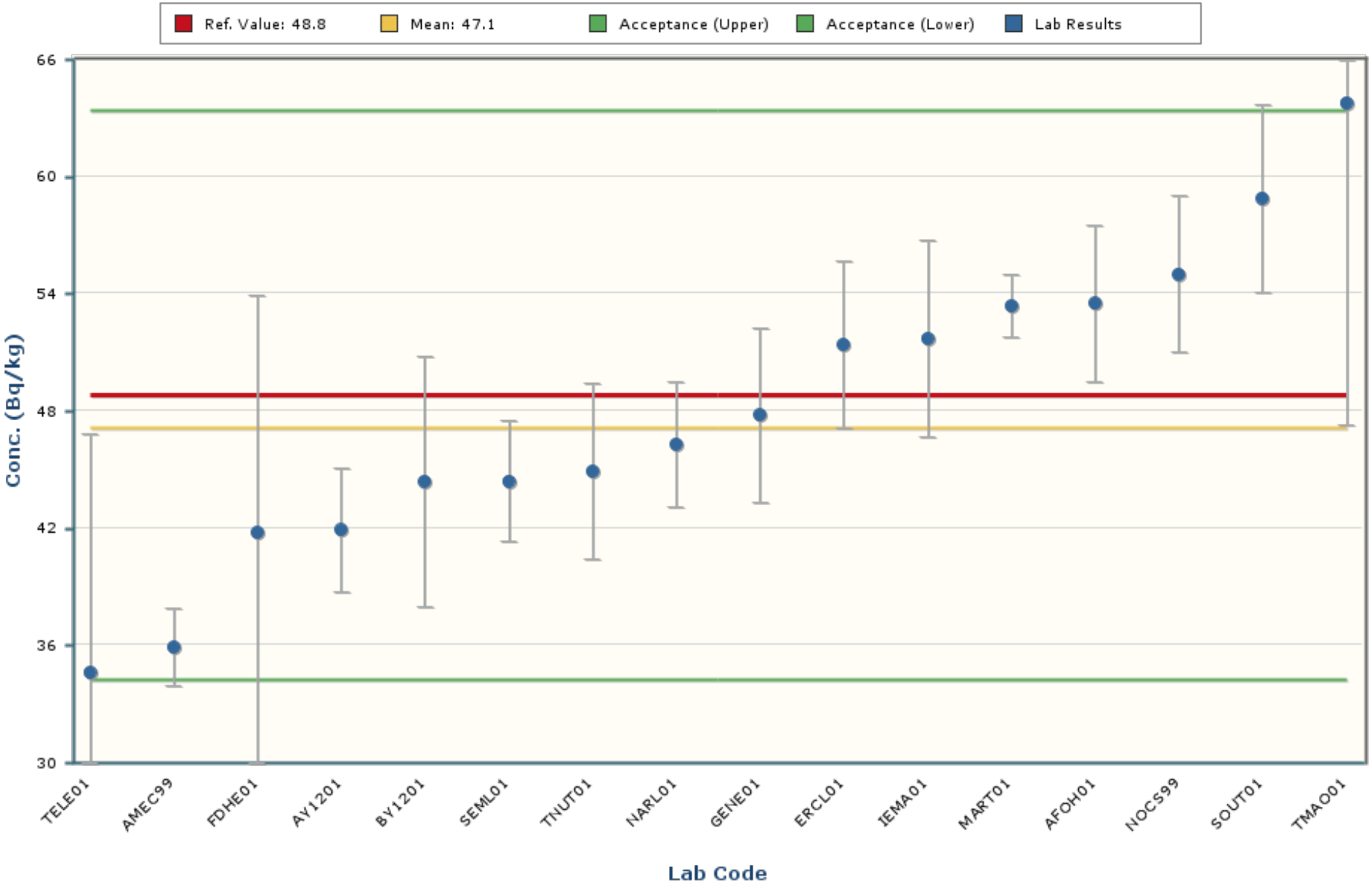
MAPEP-24-MaS50



Notes:
The chart mean excludes values outside of a bias range of ± 30%.
The chart shows only data points with values between 160 and 451 (± 5 Standard Deviations).
The error bars encompassing each result are plotted at ± one standard deviation.

Thorium-228

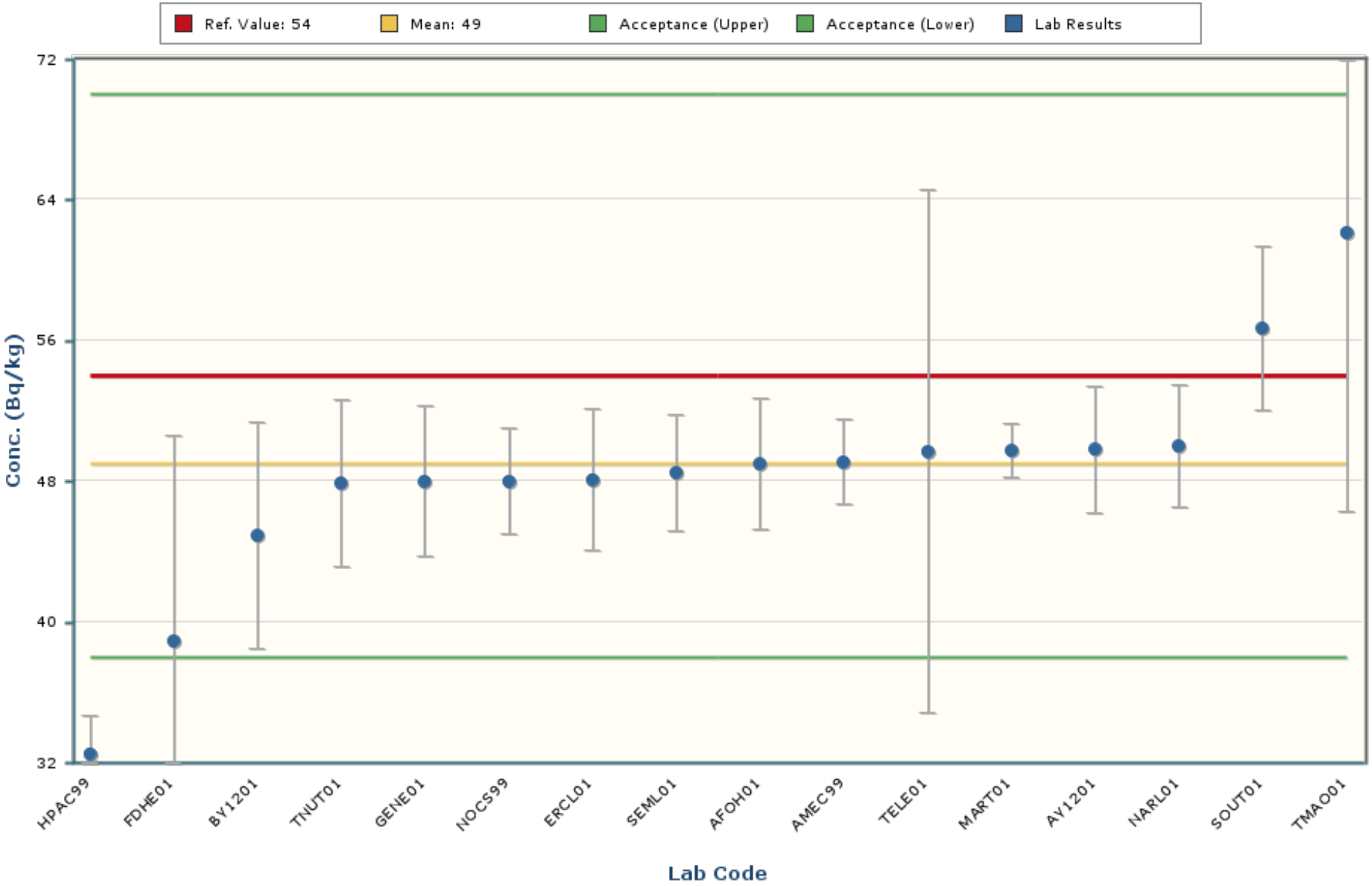
MAPEP-24-MaS50



Notes:
The chart mean excludes values outside of a bias range of ± 30%.
The chart shows only data points with values between 12.2 and 81.9 (± 5 Standard Deviations).
The error bars encompassing each result are plotted at ± one standard deviation.

Thorium-230

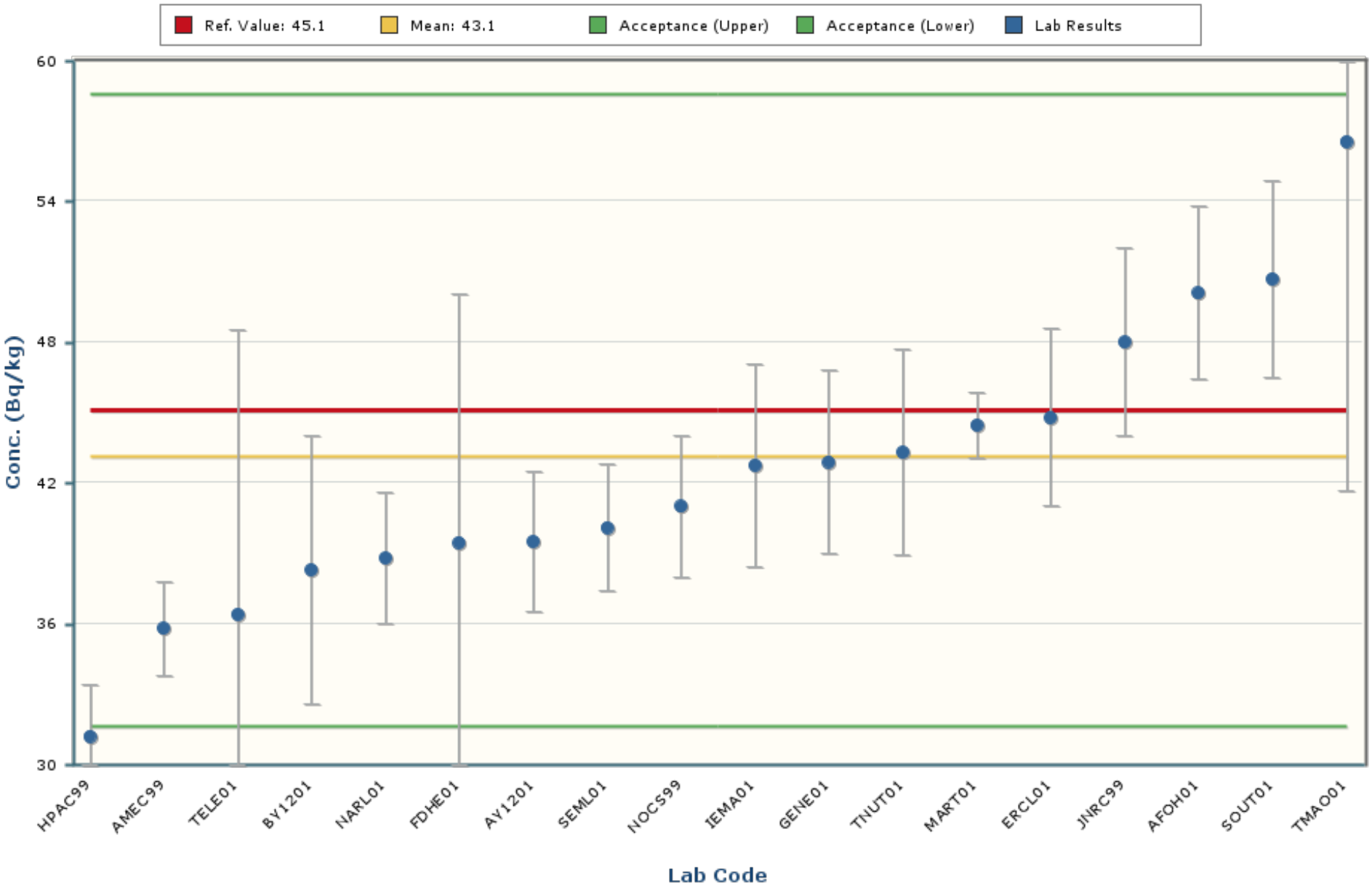
MAPEP-24-MaS50



Notes:
The chart mean excludes values outside of a bias range of ± 30%.
The chart shows only data points with values between 24 and 75 (± 5 Standard Deviations).
The error bars encompassing each result are plotted at ± one standard deviation.

Thorium-232

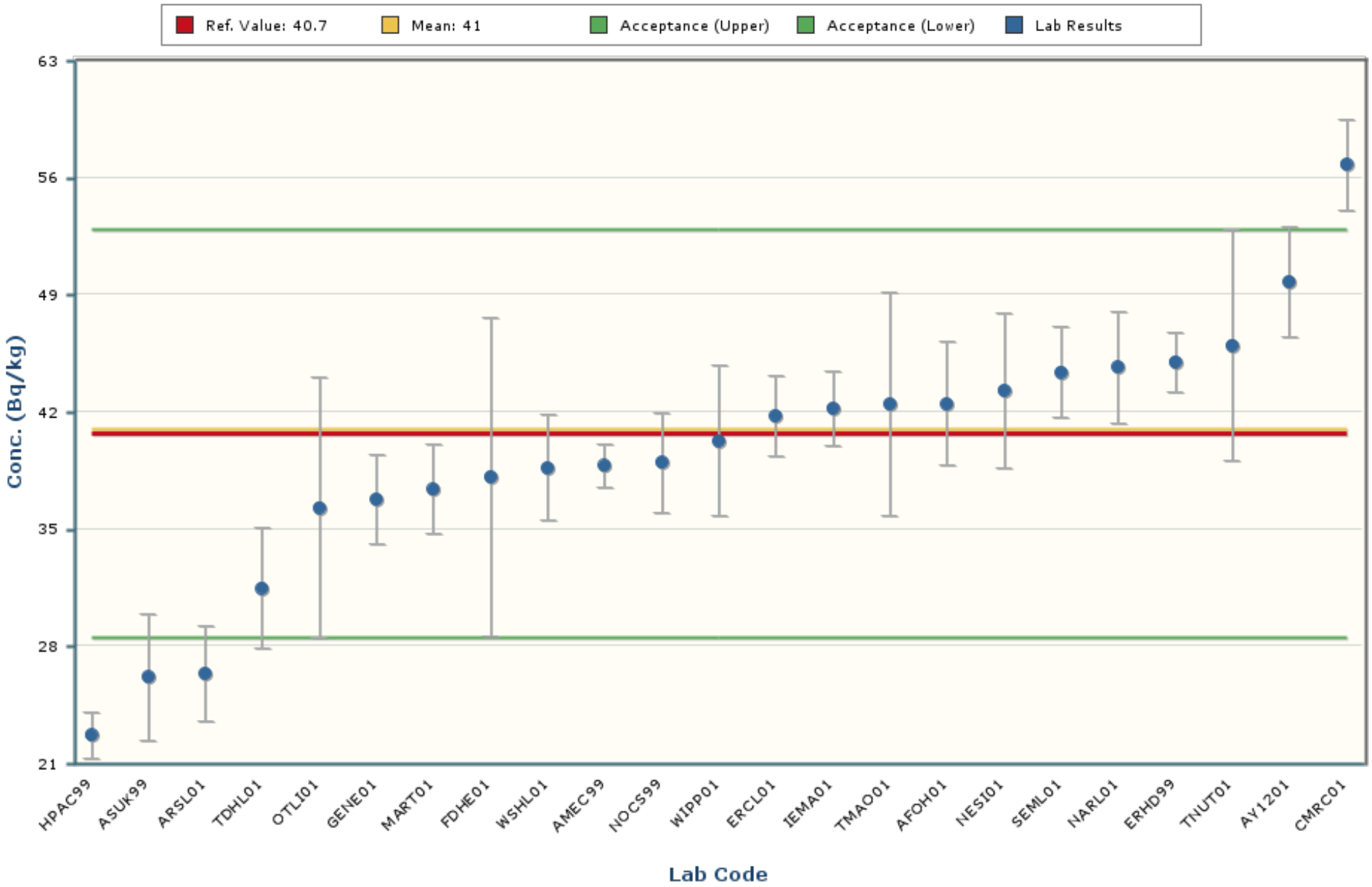
MAPEP-24-MaS50



Notes:
The chart mean excludes values outside of a bias range of ± 30%.
The chart shows only data points with values between 15.3 and 71.0 (± 5 Standard Deviations).
The error bars encompassing each result are plotted at ± one standard deviation.

Uranium-234

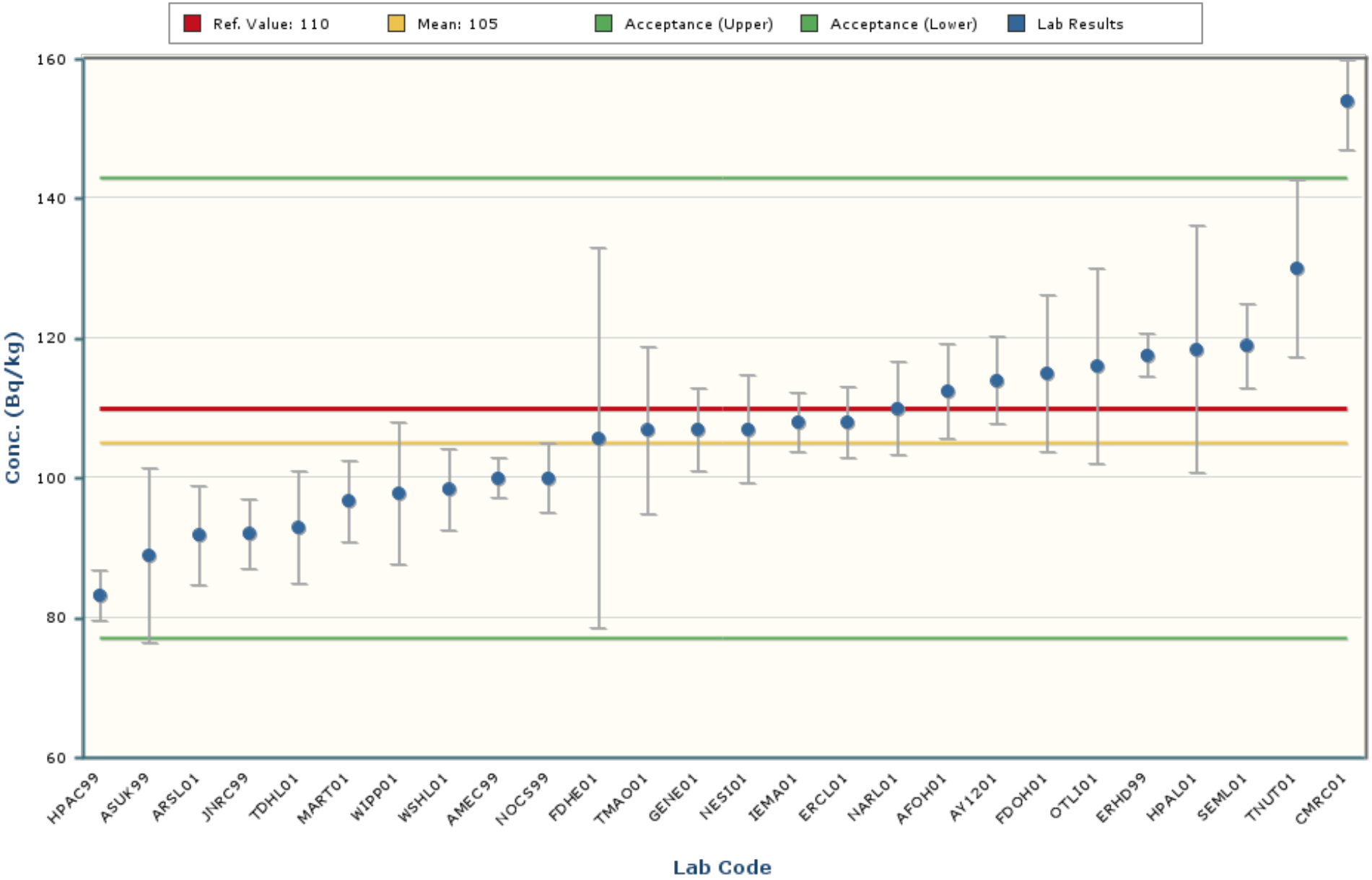
MAPEP-24-MaS50



Notes:
The chart mean excludes values outside of a bias range of ± 30%.
The chart shows only data points with values between 19.9 and 62.1 (± 5 Standard Deviations).
The error bars encompassing each result are plotted at ± one standard deviation.

Uranium-238

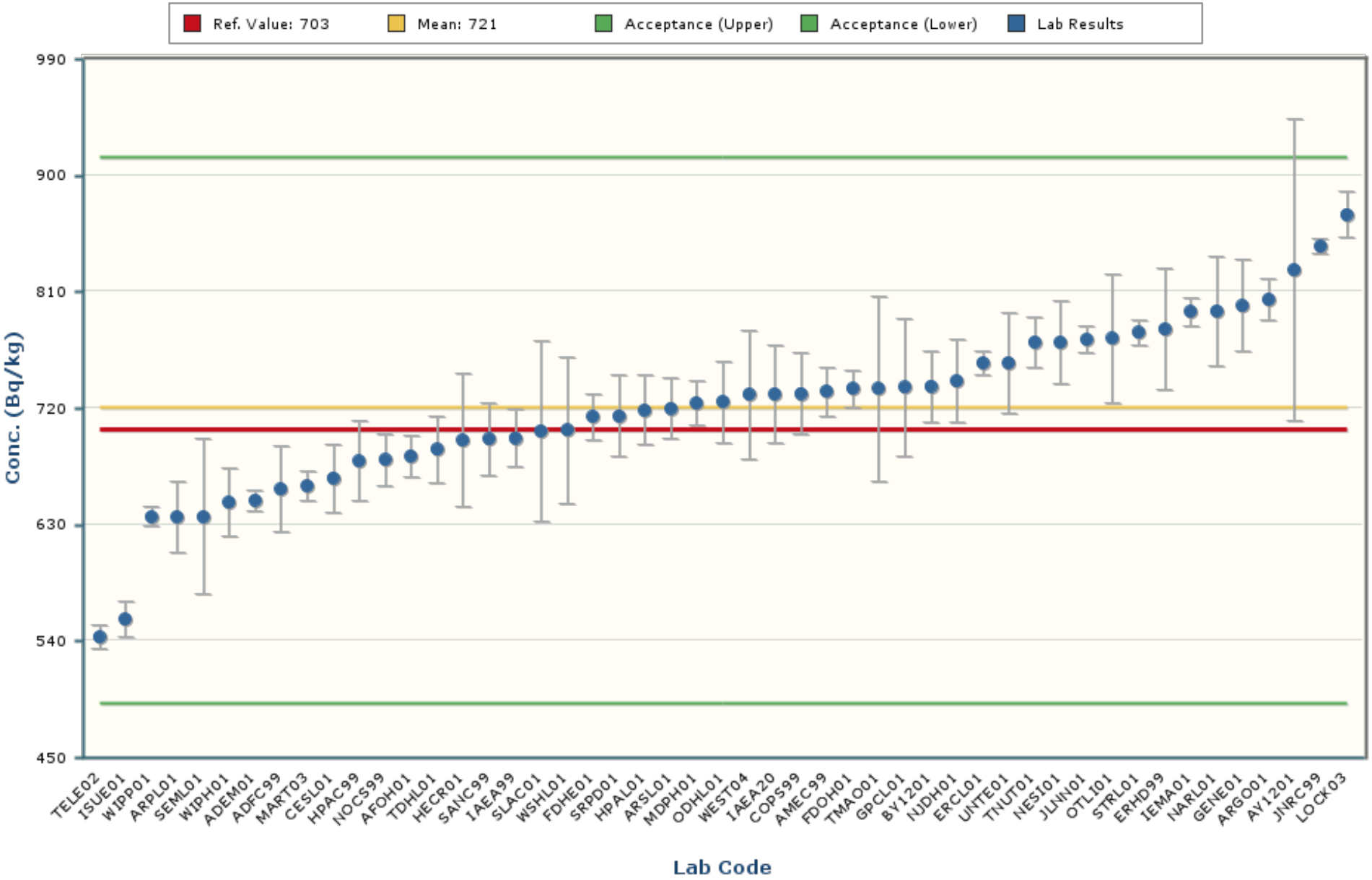
MAPEP-24-MaS50



Notes:
The chart mean excludes values outside of a bias range of ± 30%.
The chart shows only data points with values between 50 and 161 (± 5 Standard Deviations).
The error bars encompassing each result are plotted at ± one standard deviation.

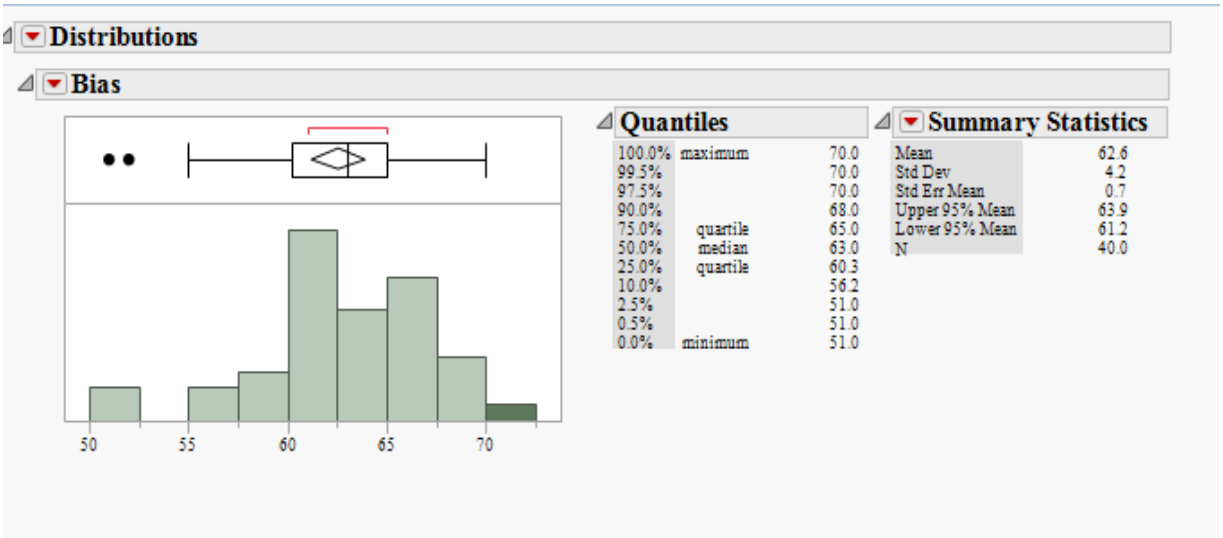
Zinc-65

MAPEP-24-MaS50



Notes:
The chart mean excludes values outside of a bias range of ± 30%.
The chart shows only data points with values between 395 and 1047 (± 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. Biases greater than +/- 100% have been screened from the data. The box plot of the bias data points and the mean visually illustrate the breadth of the distribution and where potential outliers in the distribution might lie. The statistics for the distribution plot are provided adjacent to 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.

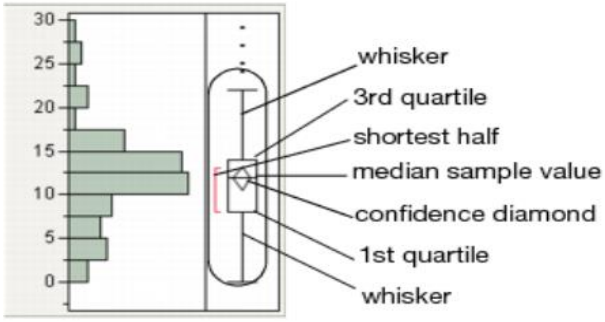


Outlier Box Plot

The BLACK small vertical line inside the small rectangle at the top of the data distribution graph is the median of the population of the bias shown for that analyte in the matrix. The confidence diamond contains the mean and the upper and lower 95% of the mean. If you drew a line through the middle of the diamond, you would have the mean. The top and bottom points of the diamond represent the upper and lower 95% of the mean. The ends of the box represent the 25th and 75th quantiles, also expressed as 1st and 3rd quartile. The difference between the 1st and 3rd quartiles is called the interquartile range. Each box has lines that extend from each end, sometimes called whiskers. The whiskers extend from the ends of the box to the outermost data point that falls within the distances computed as follows:

3rd quartile + 1.5*(interquartile range)

1st quartile - 1.5*(interquartile range)



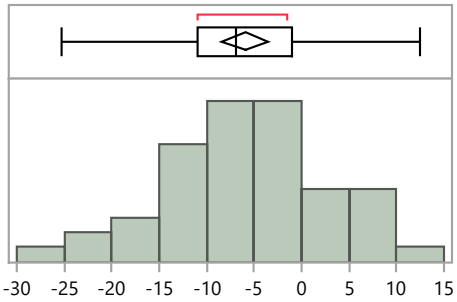
If the data points do not reach the computed ranges, then the whiskers are determined by the upper and lower data point values (not including outliers). The bracket outside of the box identifies the *shortest half*, which is the most dense 50% of the observations (Rousseuw and Leroy 1987).

Ref. "SAS Institute Inc. 2016. JMP® 13 Basic Analysis. Cary, NC: SAS Institute Inc."

MaS50 Distribution by Detection Method

Distributions Analyte_Detection=Cesium-134 Gamma Spectrometry

Bias

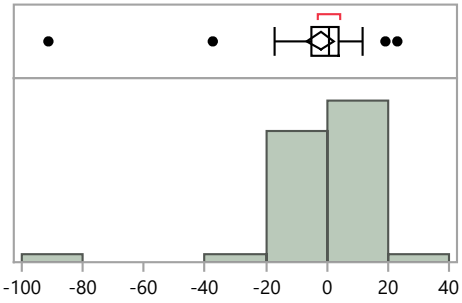


Quantiles		
100.0%	maximum	12.5
99.5%		12.5
97.5%		11.8
90.0%		5.6
75.0%	quartile	-1.0
50.0%	median	-6.9
25.0%	quartile	-10.9
10.0%		-17.1
2.5%		-25.0
0.5%		-25.3
0.0%	minimum	-25.3

Summary Statistics	
Mean	-6.0
Std Dev	8.5
Std Err Mean	1.2
Upper 95% Mean	-3.5
Lower 95% Mean	-8.5
N	47.0

Distributions Analyte_Detection=Cesium-137 Gamma Spectrometry

Bias

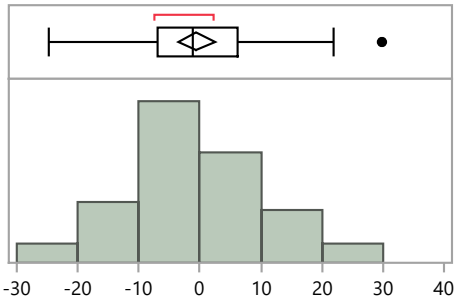


Quantiles		
100.0%	maximum	23.0
99.5%		23.0
97.5%		21.9
90.0%		9.3
75.0%	quartile	4.0
50.0%	median	0.5
25.0%	quartile	-5.0
10.0%		-15.9
2.5%		-76.4
0.5%		-91.2
0.0%	minimum	-91.2

Summary Statistics	
Mean	-2.2
Std Dev	15.9
Std Err Mean	2.2
Upper 95% Mean	2.3
Lower 95% Mean	-6.8
N	50.0

Distributions Analyte_Detection=Cobalt-57 Gamma Spectrometry

Bias



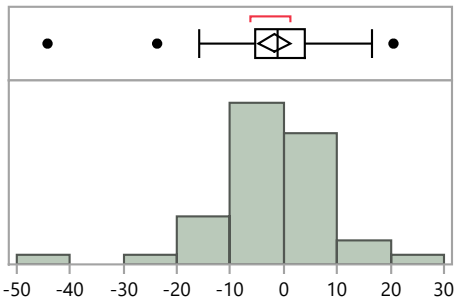
Quantiles		
100.0%	maximum	29.8
99.5%		29.8
97.5%		27.8
90.0%		14.5
75.0%	quartile	6.2
50.0%	median	-1.2
25.0%	quartile	-7.0
10.0%		-14.2
2.5%		-23.7
0.5%		-24.8
0.0%	minimum	-24.8

Summary Statistics	
Mean	-0.5
Std Dev	10.8
Std Err Mean	1.5
Upper 95% Mean	2.6
Lower 95% Mean	-3.6
N	49.0

MaS50 Distribution by Detection Method

Distributions Analyte_Detection=Cobalt-60 Gamma Spectrometry

Bias

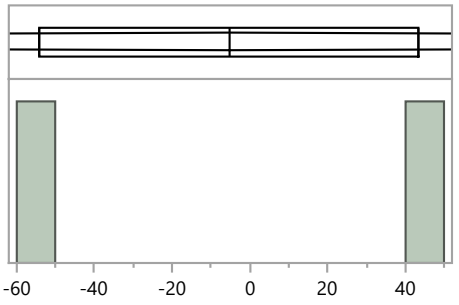


Quantiles		
100.0%	maximum	20.5
99.5%		20.5
97.5%		19.4
90.0%		9.8
75.0%	quartile	4.1
50.0%	median	-1.1
25.0%	quartile	-5.2
10.0%		-13.7
2.5%		-38.6
0.5%		-44.2
0.0%	minimum	-44.2

Summary Statistics	
Mean	-1.7
Std Dev	10.4
Std Err Mean	1.5
Upper 95% Mean	1.2
Lower 95% Mean	-4.7
N	50.0

Distributions Analyte_Detection=Iron-55 Gamma Spectrometry

Bias

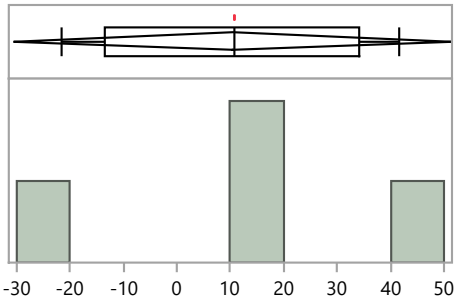


Quantiles		
100.0%	maximum	43.5
99.5%		43.5
97.5%		43.5
90.0%		43.5
75.0%	quartile	43.5
50.0%	median	-5.4
25.0%	quartile	-54.3
10.0%		-54.3
2.5%		-54.3
0.5%		-54.3
0.0%	minimum	-54.3

Summary Statistics	
Mean	-5.4
Std Dev	69.2
Std Err Mean	48.9
Upper 95% Mean	615.9
Lower 95% Mean	-626.7
N	2.0

Distributions Analyte_Detection=Iron-55 Liquid Scintillation Counter

Bias



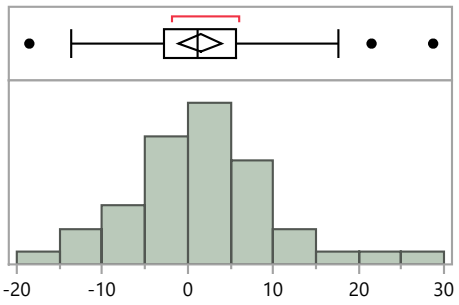
Quantiles		
100.0%	maximum	41.7
99.5%		41.7
97.5%		41.7
90.0%		41.7
75.0%	quartile	34.0
50.0%	median	10.7
25.0%	quartile	-13.5
10.0%		-21.5
2.5%		-21.5
0.5%		-21.5
0.0%	minimum	-21.5

Summary Statistics	
Mean	10.4
Std Dev	25.8
Std Err Mean	12.9
Upper 95% Mean	51.5
Lower 95% Mean	-30.7
N	4.0

MaS50 Distribution by Detection Method

Distributions Analyte_Detection=Manganese-54 Gamma Spectrometry

Bias

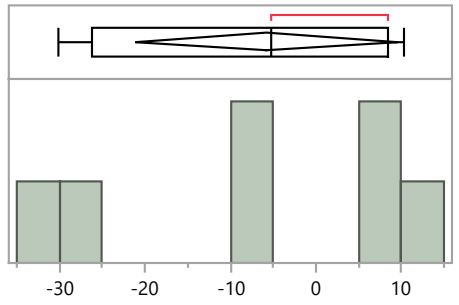


Quantiles		
100.0%	maximum	28.7
99.5%		28.7
97.5%		26.9
90.0%		13.3
75.0%	quartile	5.6
50.0%	median	1.2
25.0%	quartile	-2.9
10.0%		-9.6
2.5%		-17.3
0.5%		-18.5
0.0%	minimum	-18.5

Summary Statistics	
Mean	1.5
Std Dev	8.6
Std Err Mean	1.2
Upper 95% Mean	4.0
Lower 95% Mean	-1.0
N	49.0

Distributions Analyte_Detection=Nickel-63 Liquid Scintillation Counter

Bias

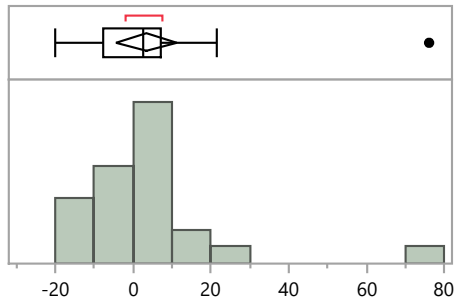


Quantiles		
100.0%	maximum	10.3
99.5%		10.3
97.5%		10.3
90.0%		10.3
75.0%	quartile	8.4
50.0%	median	-5.2
25.0%	quartile	-26.1
10.0%		-30.1
2.5%		-30.1
0.5%		-30.1
0.0%	minimum	-30.1

Summary Statistics	
Mean	-5.8
Std Dev	16.5
Std Err Mean	6.3
Upper 95% Mean	9.5
Lower 95% Mean	-21.1
N	7.0

Distributions Analyte_Detection=Plutonium-238 Alpha Spectrometry

Bias



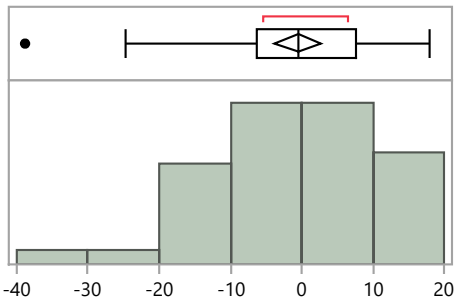
Quantiles		
100.0%	maximum	76.1
99.5%		76.1
97.5%		76.1
90.0%		18.7
75.0%	quartile	7.0
50.0%	median	2.6
25.0%	quartile	-7.5
10.0%		-15.2
2.5%		-19.9
0.5%		-19.9
0.0%	minimum	-19.9

Summary Statistics	
Mean	3.5
Std Dev	18.5
Std Err Mean	3.8
Upper 95% Mean	11.3
Lower 95% Mean	-4.3
N	24.0

MaS50 Distribution by Detection Method

Distributions Analyte_Detection=Potassium-40 Gamma Spectrometry

Bias

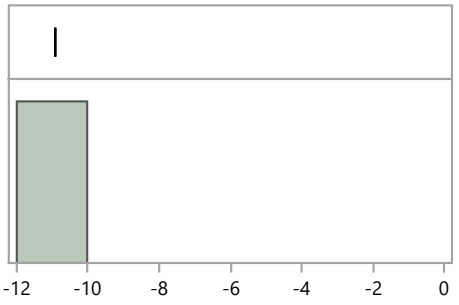


Quantiles		
100.0%	maximum	17.9
99.5%		17.9
97.5%		17.6
90.0%		11.1
75.0%	quartile	7.6
50.0%	median	-0.4
25.0%	quartile	-6.2
10.0%		-12.2
2.5%		-36.7
0.5%		-38.8
0.0%	minimum	-38.8

Summary Statistics	
Mean	-0.5
Std Dev	10.8
Std Err Mean	1.6
Upper 95% Mean	2.7
Lower 95% Mean	-3.8
N	45.0

Distributions Analyte_Detection=Strontium-90 Alpha Spectrometry

Bias

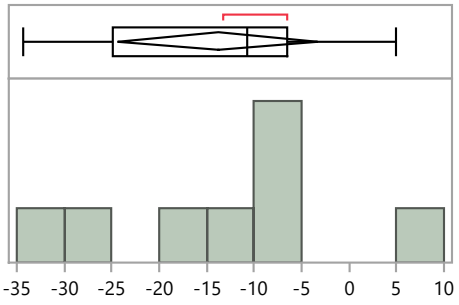


Quantiles		
100.0%	maximum	-10.9
99.5%		-10.9
97.5%		-10.9
90.0%		-10.9
75.0%	quartile	-10.9
50.0%	median	-10.9
25.0%	quartile	-10.9
10.0%		-10.9
2.5%		-10.9
0.5%		-10.9
0.0%	minimum	-10.9

Summary Statistics	
Mean	-10.9
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

Distributions Analyte_Detection=Strontium-90 Gas Flow Proportional Counter

Bias



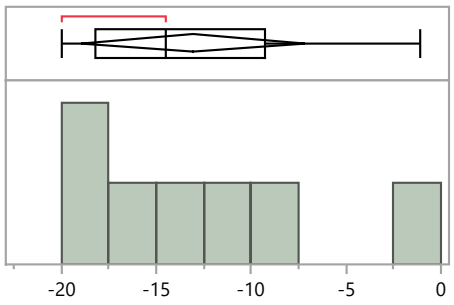
Quantiles		
100.0%	maximum	5.0
99.5%		5.0
97.5%		5.0
90.0%		5.0
75.0%	quartile	-6.5
50.0%	median	-10.7
25.0%	quartile	-25.0
10.0%		-34.3
2.5%		-34.3
0.5%		-34.3
0.0%	minimum	-34.3

Summary Statistics	
Mean	-13.8
Std Dev	12.6
Std Err Mean	4.5
Upper 95% Mean	-3.3
Lower 95% Mean	-24.3
N	8.0

MaS50 Distribution by Detection Method

Distributions Analyte_Detection=Strontium-90 Gross Alpha/Beta - 2 pi gas flow proportional counter

Bias

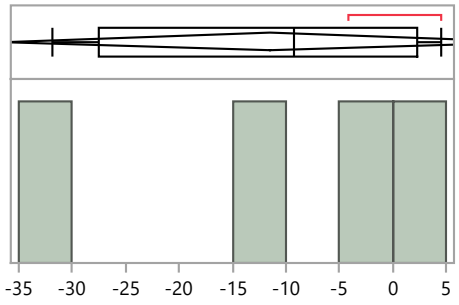


Quantiles		
100.0%	maximum	-1.1
99.5%		-1.1
97.5%		-1.1
90.0%		-1.1
75.0%	quartile	-9.3
50.0%	median	-14.5
25.0%	quartile	-18.2
10.0%		-20.0
2.5%		-20.0
0.5%		-20.0
0.0%	minimum	-20.0

Summary Statistics	
Mean	-13.1
Std Dev	6.4
Std Err Mean	2.4
Upper 95% Mean	-7.2
Lower 95% Mean	-19.0
N	7.0

Distributions Analyte_Detection=Strontium-90 Liquid Scintillation Counter

Bias

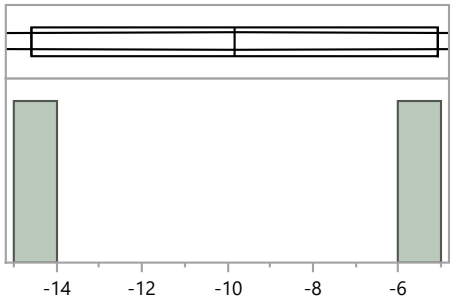


Quantiles		
100.0%	maximum	4.5
99.5%		4.5
97.5%		4.5
90.0%		4.5
75.0%	quartile	2.4
50.0%	median	-9.3
25.0%	quartile	-27.5
10.0%		-31.8
2.5%		-31.8
0.5%		-31.8
0.0%	minimum	-31.8

Summary Statistics	
Mean	-11.5
Std Dev	15.6
Std Err Mean	7.8
Upper 95% Mean	13.4
Lower 95% Mean	-36.3
N	4.0

Distributions Analyte_Detection=Technetium-99 Inductively Coupled Plasma Mass Spectrometry

Bias



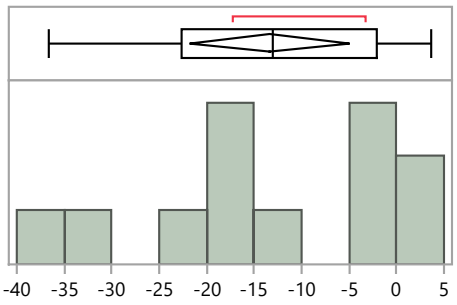
Quantiles		
100.0%	maximum	-5.1
99.5%		-5.1
97.5%		-5.1
90.0%		-5.1
75.0%	quartile	-5.1
50.0%	median	-9.9
25.0%	quartile	-14.6
10.0%		-14.6
2.5%		-14.6
0.5%		-14.6
0.0%	minimum	-14.6

Summary Statistics	
Mean	-9.9
Std Dev	6.7
Std Err Mean	4.8
Upper 95% Mean	50.5
Lower 95% Mean	-70.2
N	2.0

MaS50 Distribution by Detection Method

Distributions Analyte_Detection=Technetium-99 Liquid Scintillation Counter

Bias

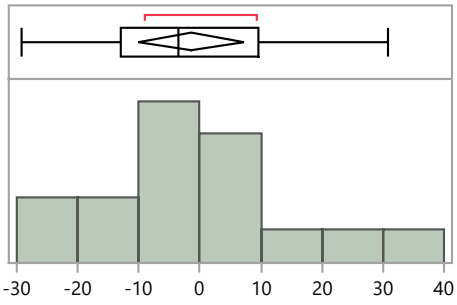


Quantiles		
100.0%	maximum	3.6
99.5%		3.6
97.5%		3.6
90.0%		2.7
75.0%	quartile	-2.2
50.0%	median	-13.1
25.0%	quartile	-22.6
10.0%		-35.8
2.5%		-36.6
0.5%		-36.6
0.0%	minimum	-36.6

Summary Statistics	
Mean	-13.3
Std Dev	13.3
Std Err Mean	3.8
Upper 95% Mean	-4.9
Lower 95% Mean	-21.8
N	12.0

Distributions Analyte_Detection=Thorium-228 Alpha Spectrometry

Bias

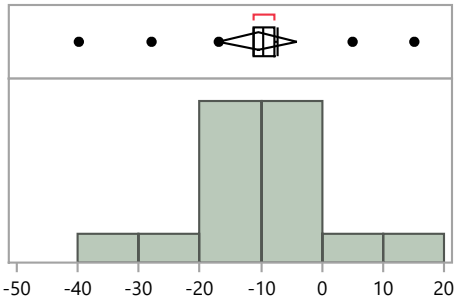


Quantiles		
100.0%	maximum	30.7
99.5%		30.7
97.5%		30.7
90.0%		23.7
75.0%	quartile	9.6
50.0%	median	-3.6
25.0%	quartile	-12.8
10.0%		-27.2
2.5%		-29.1
0.5%		-29.1
0.0%	minimum	-29.1

Summary Statistics	
Mean	-1.4
Std Dev	16.2
Std Err Mean	4.1
Upper 95% Mean	7.2
Lower 95% Mean	-10.1
N	16.0

Distributions Analyte_Detection=Thorium-230 Alpha Spectrometry

Bias



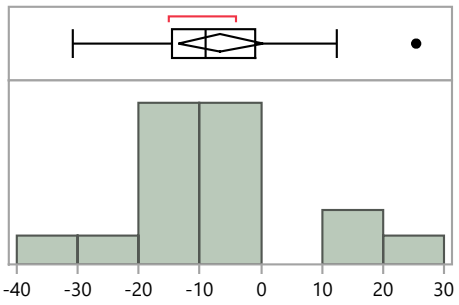
Quantiles		
100.0%	maximum	15.1
99.5%		15.1
97.5%		15.1
90.0%		8.0
75.0%	quartile	-7.8
50.0%	median	-9.8
25.0%	quartile	-11.3
10.0%		-31.5
2.5%		-39.8
0.5%		-39.8
0.0%	minimum	-39.8

Summary Statistics	
Mean	-10.5
Std Dev	11.9
Std Err Mean	3.0
Upper 95% Mean	-4.2
Lower 95% Mean	-16.9
N	16.0

MaS50 Distribution by Detection Method

Distributions Analyte_Detection=Thorium-232 Alpha Spectrometry

Bias

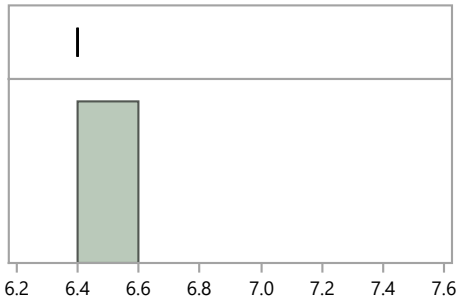


Quantiles		
100.0%	maximum	25.4
99.5%		25.4
97.5%		25.4
90.0%		15.0
75.0%	quartile	-1.1
50.0%	median	-9.1
25.0%	quartile	-14.6
10.0%		-22.6
2.5%		-30.8
0.5%		-30.8
0.0%	minimum	-30.8

Summary Statistics	
Mean	-6.6
Std Dev	13.5
Std Err Mean	3.3
Upper 95% Mean	0.4
Lower 95% Mean	-13.6
N	17.0

Distributions Analyte_Detection=Thorium-232 Gamma Spectrometry

Bias

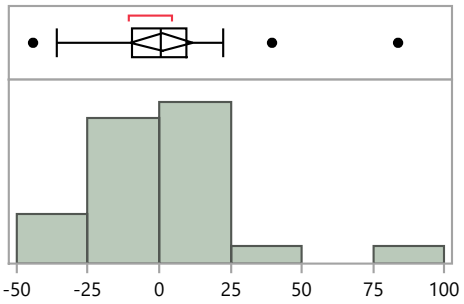


Quantiles		
100.0%	maximum	6.4
99.5%		6.4
97.5%		6.4
90.0%		6.4
75.0%	quartile	6.4
50.0%	median	6.4
25.0%	quartile	6.4
10.0%		6.4
2.5%		6.4
0.5%		6.4
0.0%	minimum	6.4

Summary Statistics	
Mean	6.4
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

Distributions Analyte_Detection=Uranium-234 Alpha Spectrometry

Bias



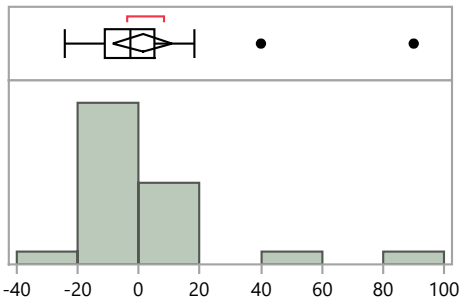
Quantiles		
100.0%	maximum	83.8
99.5%		83.8
97.5%		83.8
90.0%		31.0
75.0%	quartile	9.6
50.0%	median	0.9
25.0%	quartile	-9.2
10.0%		-35.5
2.5%		-44.2
0.5%		-44.2
0.0%	minimum	-44.2

Summary Statistics	
Mean	0.9
Std Dev	25.5
Std Err Mean	5.2
Upper 95% Mean	11.7
Lower 95% Mean	-9.8
N	24.0

MaS50 Distribution by Detection Method

Distributions Analyte_Detection=Uranium-238 Alpha Spectrometry

Bias

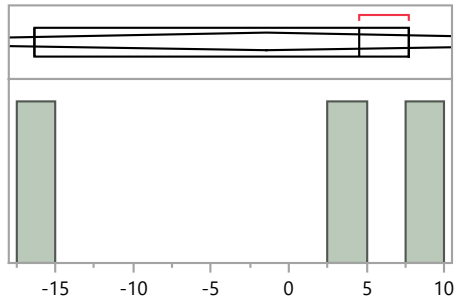


Quantiles		
100.0%	maximum	90.0
99.5%		90.0
97.5%		90.0
90.0%		29.1
75.0%	quartile	5.0
50.0%	median	-2.7
25.0%	quartile	-11.0
10.0%		-17.9
2.5%		-24.4
0.5%		-24.4
0.0%	minimum	-24.4

Summary Statistics	
Mean	1.3
Std Dev	23.1
Std Err Mean	4.7
Upper 95% Mean	11.0
Lower 95% Mean	-8.4
N	24.0

Distributions Analyte_Detection=Uranium-238 Gamma Spectrometry

Bias

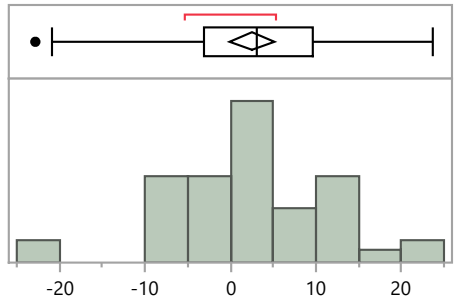


Quantiles		
100.0%	maximum	7.7
99.5%		7.7
97.5%		7.7
90.0%		7.7
75.0%	quartile	7.7
50.0%	median	4.5
25.0%	quartile	-16.4
10.0%		-16.4
2.5%		-16.4
0.5%		-16.4
0.0%	minimum	-16.4

Summary Statistics	
Mean	-1.4
Std Dev	13.1
Std Err Mean	7.6
Upper 95% Mean	31.1
Lower 95% Mean	-33.9
N	3.0

Distributions Analyte_Detection=Zinc-65 Gamma Spectrometry

Bias



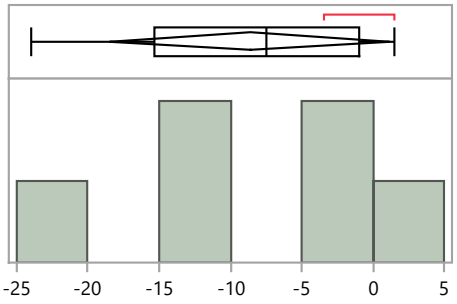
Quantiles		
100.0%	maximum	23.7
99.5%		23.7
97.5%		22.8
90.0%		13.7
75.0%	quartile	9.7
50.0%	median	3.1
25.0%	quartile	-3.1
10.0%		-9.5
2.5%		-22.3
0.5%		-22.8
0.0%	minimum	-22.8

Summary Statistics	
Mean	2.6
Std Dev	9.3
Std Err Mean	1.3
Upper 95% Mean	5.2
Lower 95% Mean	-0.1
N	49.0

MaS50 Distribution by Preparation Method

Distributions Analyte_Method=Cesium-134 EPA 901.1, Gamma Emitting, 600/4-80-032

Bias

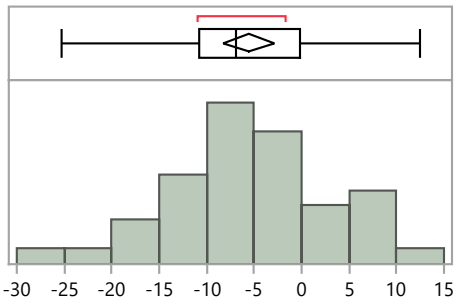


Quantiles		
100.0%	maximum	1.5
99.5%		1.5
97.5%		1.5
90.0%		1.5
75.0%	quartile	-1.0
50.0%	median	-7.5
25.0%	quartile	-15.4
10.0%		-24.0
2.5%		-24.0
0.5%		-24.0
0.0%	minimum	-24.0

Summary Statistics	
Mean	-8.6
Std Dev	9.3
Std Err Mean	3.8
Upper 95% Mean	1.2
Lower 95% Mean	-18.4
N	6.0

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

Bias

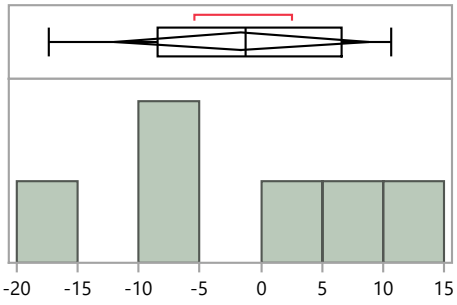


Quantiles		
100.0%	maximum	12.5
99.5%		12.5
97.5%		12.3
90.0%		5.8
75.0%	quartile	-0.3
50.0%	median	-6.9
25.0%	quartile	-10.8
10.0%		-16.9
2.5%		-25.1
0.5%		-25.3
0.0%	minimum	-25.3

Summary Statistics	
Mean	-5.6
Std Dev	8.4
Std Err Mean	1.3
Upper 95% Mean	-2.9
Lower 95% Mean	-8.2
N	41.0

Distributions Analyte_Method=Cesium-137 EPA 901.1, Gamma Emitting, 600/4-80-032

Bias



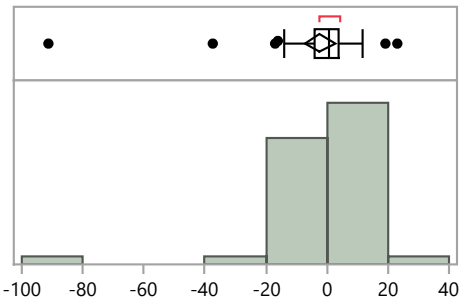
Quantiles		
100.0%	maximum	10.6
99.5%		10.6
97.5%		10.6
90.0%		10.6
75.0%	quartile	6.6
50.0%	median	-1.3
25.0%	quartile	-8.4
10.0%		-17.4
2.5%		-17.4
0.5%		-17.4
0.0%	minimum	-17.4

Summary Statistics	
Mean	-1.6
Std Dev	9.9
Std Err Mean	4.0
Upper 95% Mean	8.8
Lower 95% Mean	-12.0
N	6.0

MaS50 Distribution by Preparation Method

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

Bias

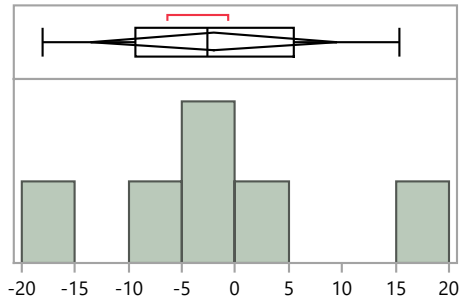


Quantiles		
100.0%	maximum	23.0
99.5%		23.0
97.5%		22.5
90.0%		9.2
75.0%	quartile	3.7
50.0%	median	0.5
25.0%	quartile	-4.0
10.0%		-15.0
2.5%		-84.5
0.5%		-91.2
0.0%	minimum	-91.2

Summary Statistics	
Mean	-2.3
Std Dev	16.6
Std Err Mean	2.5
Upper 95% Mean	2.7
Lower 95% Mean	-7.4
N	44.0

Distributions Analyte_Method=Cobalt-57 EPA 901.1, Gamma Emitting, 600/4-80-032

Bias

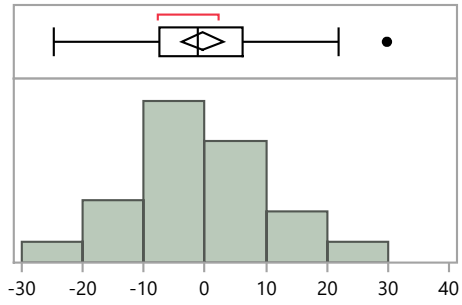


Quantiles		
100.0%	maximum	15.3
99.5%		15.3
97.5%		15.3
90.0%		15.3
75.0%	quartile	5.5
50.0%	median	-2.6
25.0%	quartile	-9.3
10.0%		-18.0
2.5%		-18.0
0.5%		-18.0
0.0%	minimum	-18.0

Summary Statistics	
Mean	-2.0
Std Dev	11.0
Std Err Mean	4.5
Upper 95% Mean	9.5
Lower 95% Mean	-13.5
N	6.0

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

Bias



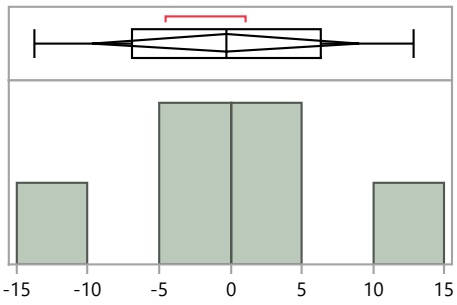
Quantiles		
100.0%	maximum	29.8
99.5%		29.8
97.5%		29.0
90.0%		13.9
75.0%	quartile	6.3
50.0%	median	-1.2
25.0%	quartile	-7.5
10.0%		-13.2
2.5%		-24.4
0.5%		-24.8
0.0%	minimum	-24.8

Summary Statistics	
Mean	-0.3
Std Dev	10.8
Std Err Mean	1.7
Upper 95% Mean	3.0
Lower 95% Mean	-3.6
N	43.0

MaS50 Distribution by Preparation Method

Distributions Analyte_Method=Cobalt-60 EPA 901.1, Gamma Emitting, 600/4-80-032

Bias

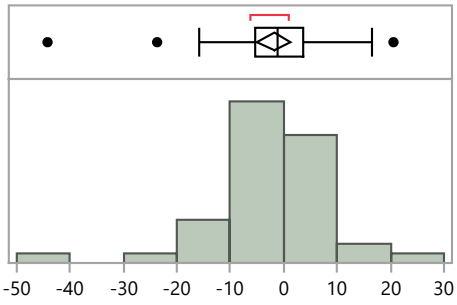


Quantiles		
100.0%	maximum	12.8
99.5%		12.8
97.5%		12.8
90.0%		12.8
75.0%	quartile	6.4
50.0%	median	-0.3
25.0%	quartile	-6.9
10.0%		-13.8
2.5%		-13.8
0.5%		-13.8
0.0%	minimum	-13.8

Summary Statistics	
Mean	-0.3
Std Dev	8.9
Std Err Mean	3.6
Upper 95% Mean	9.0
Lower 95% Mean	-9.7
N	6.0

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

Bias

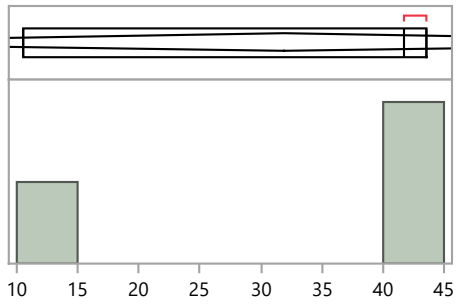


Quantiles		
100.0%	maximum	20.5
99.5%		20.5
97.5%		20.0
90.0%		9.7
75.0%	quartile	3.7
50.0%	median	-1.1
25.0%	quartile	-5.3
10.0%		-13.7
2.5%		-41.6
0.5%		-44.2
0.0%	minimum	-44.2

Summary Statistics	
Mean	-1.9
Std Dev	10.6
Std Err Mean	1.6
Upper 95% Mean	1.3
Lower 95% Mean	-5.2
N	44.0

Distributions Analyte_Method=Iron-55 Acid dissolution with hydrofluoric acid

Bias



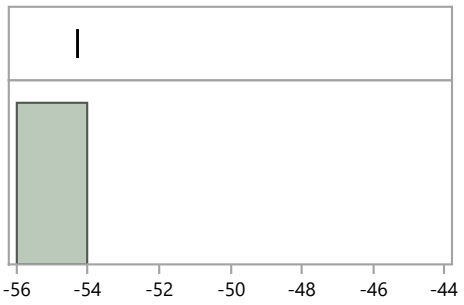
Quantiles		
100.0%	maximum	43.5
99.5%		43.5
97.5%		43.5
90.0%		43.5
75.0%	quartile	43.5
50.0%	median	41.7
25.0%	quartile	10.6
10.0%		10.6
2.5%		10.6
0.5%		10.6
0.0%	minimum	10.6

Summary Statistics	
Mean	31.9
Std Dev	18.5
Std Err Mean	10.7
Upper 95% Mean	77.9
Lower 95% Mean	-14.0
N	3.0

MaS50 Distribution by Preparation Method

Distributions Analyte_Method=Iron-55 Acid leaching without hydrofluoric acid

Bias

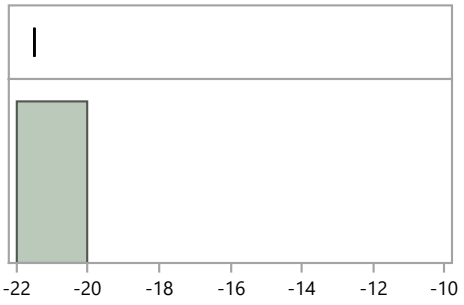


Quantiles		
100.0%	maximum	-54.3
99.5%		-54.3
97.5%		-54.3
90.0%		-54.3
75.0%	quartile	-54.3
50.0%	median	-54.3
25.0%	quartile	-54.3
10.0%		-54.3
2.5%		-54.3
0.5%		-54.3
0.0%	minimum	-54.3

Summary Statistics	
Mean	-54.3
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

Distributions Analyte_Method=Iron-55 Other

Bias

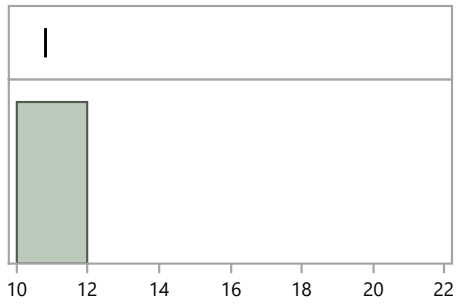


Quantiles		
100.0%	maximum	-21.5
99.5%		-21.5
97.5%		-21.5
90.0%		-21.5
75.0%	quartile	-21.5
50.0%	median	-21.5
25.0%	quartile	-21.5
10.0%		-21.5
2.5%		-21.5
0.5%		-21.5
0.0%	minimum	-21.5

Summary Statistics	
Mean	-21.5
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

Distributions Analyte_Method=Iron-55 Total dissolution by fusion

Bias



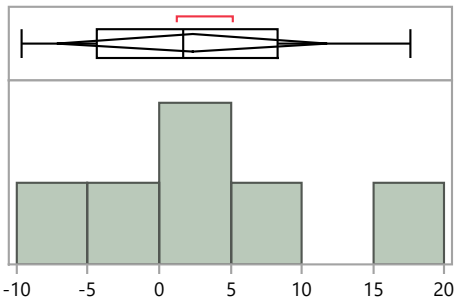
Quantiles		
100.0%	maximum	10.8
99.5%		10.8
97.5%		10.8
90.0%		10.8
75.0%	quartile	10.8
50.0%	median	10.8
25.0%	quartile	10.8
10.0%		10.8
2.5%		10.8
0.5%		10.8
0.0%	minimum	10.8

Summary Statistics	
Mean	10.8
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

MaS50 Distribution by Preparation Method

Distributions Analyte_Method=Manganese-54 EPA 901.1, Gamma Emitting, 600/4-80-032

Bias

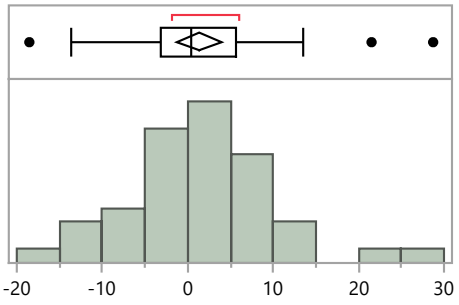


Quantiles		
100.0%	maximum	17.6
99.5%		17.6
97.5%		17.6
90.0%		17.6
75.0%	quartile	8.3
50.0%	median	1.7
25.0%	quartile	-4.4
10.0%		-9.6
2.5%		-9.6
0.5%		-9.6
0.0%	minimum	-9.6

Summary Statistics	
Mean	2.3
Std Dev	9.0
Std Err Mean	3.7
Upper 95% Mean	11.8
Lower 95% Mean	-7.2
N	6.0

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

Bias

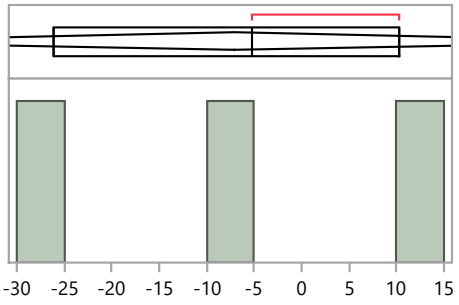


Quantiles		
100.0%	maximum	28.7
99.5%		28.7
97.5%		28.0
90.0%		12.3
75.0%	quartile	5.7
50.0%	median	0.5
25.0%	quartile	-3.1
10.0%		-9.6
2.5%		-18.0
0.5%		-18.5
0.0%	minimum	-18.5

Summary Statistics	
Mean	1.4
Std Dev	8.6
Std Err Mean	1.3
Upper 95% Mean	4.0
Lower 95% Mean	-1.3
N	43.0

Distributions Analyte_Method=Nickel-63 Acid dissolution with hydrofluoric acid

Bias



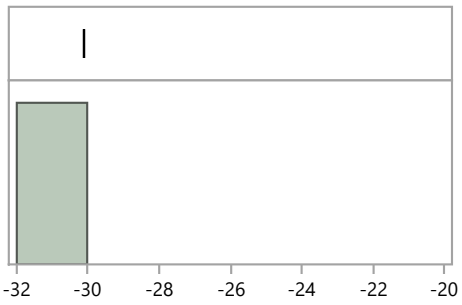
Quantiles		
100.0%	maximum	10.3
99.5%		10.3
97.5%		10.3
90.0%		10.3
75.0%	quartile	10.3
50.0%	median	-5.2
25.0%	quartile	-26.1
10.0%		-26.1
2.5%		-26.1
0.5%		-26.1
0.0%	minimum	-26.1

Summary Statistics	
Mean	-7.0
Std Dev	18.3
Std Err Mean	10.5
Upper 95% Mean	38.4
Lower 95% Mean	-52.4
N	3.0

MaS50 Distribution by Preparation Method

Distributions Analyte_Method=Nickel-63 Acid leaching without hydrofluoric acid

Bias

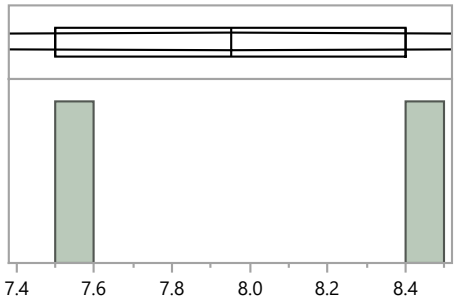


Quantiles		
100.0%	maximum	-30.1
99.5%		-30.1
97.5%		-30.1
90.0%		-30.1
75.0%	quartile	-30.1
50.0%	median	-30.1
25.0%	quartile	-30.1
10.0%		-30.1
2.5%		-30.1
0.5%		-30.1
0.0%	minimum	-30.1

Summary Statistics	
Mean	-30.1
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

Distributions Analyte_Method=Nickel-63 Other

Bias

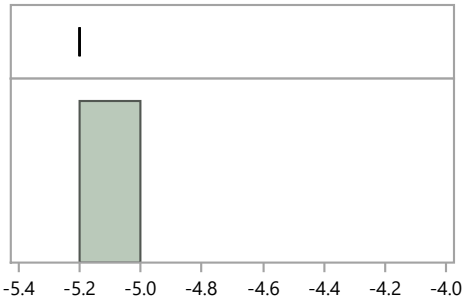


Quantiles		
100.0%	maximum	8.4
99.5%		8.4
97.5%		8.4
90.0%		8.4
75.0%	quartile	8.4
50.0%	median	8.0
25.0%	quartile	7.5
10.0%		7.5
2.5%		7.5
0.5%		7.5
0.0%	minimum	7.5

Summary Statistics	
Mean	8.0
Std Dev	0.6
Std Err Mean	0.5
Upper 95% Mean	13.7
Lower 95% Mean	2.2
N	2.0

Distributions Analyte_Method=Nickel-63 Total dissolution by fusion

Bias



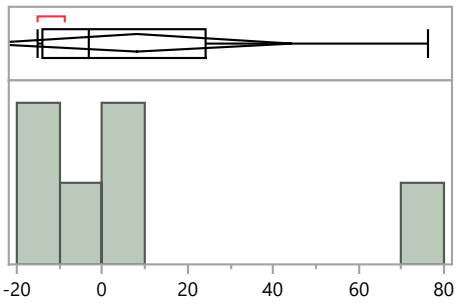
Quantiles		
100.0%	maximum	-5.2
99.5%		-5.2
97.5%		-5.2
90.0%		-5.2
75.0%	quartile	-5.2
50.0%	median	-5.2
25.0%	quartile	-5.2
10.0%		-5.2
2.5%		-5.2
0.5%		-5.2
0.0%	minimum	-5.2

Summary Statistics	
Mean	-5.2
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

MaS50 Distribution by Preparation Method

Distributions Analyte_Method=Plutonium-238 Acid dissolution with hydrofluoric acid

Bias

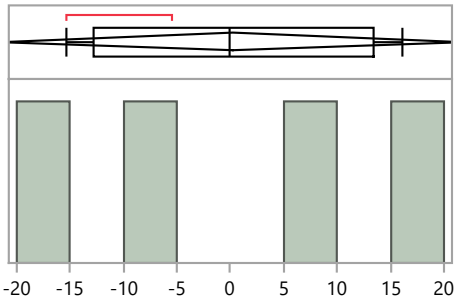


Quantiles		
100.0%	maximum	76.1
99.5%		76.1
97.5%		76.1
90.0%		76.1
75.0%	quartile	24.2
50.0%	median	-3.0
25.0%	quartile	-14.1
10.0%		-15.0
2.5%		-15.0
0.5%		-15.0
0.0%	minimum	-15.0

Summary Statistics	
Mean	8.0
Std Dev	34.5
Std Err Mean	14.1
Upper 95% Mean	44.2
Lower 95% Mean	-28.2
N	6.0

Distributions Analyte_Method=Plutonium-238 Acid leaching without hydrofluoric acid

Bias

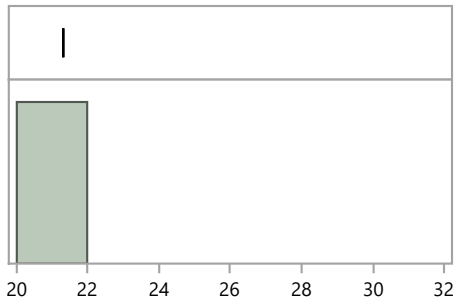


Quantiles		
100.0%	maximum	16.1
99.5%		16.1
97.5%		16.1
90.0%		16.1
75.0%	quartile	13.5
50.0%	median	0.0
25.0%	quartile	-12.9
10.0%		-15.3
2.5%		-15.3
0.5%		-15.3
0.0%	minimum	-15.3

Summary Statistics	
Mean	0.2
Std Dev	13.6
Std Err Mean	6.8
Upper 95% Mean	21.8
Lower 95% Mean	-21.4
N	4.0

Distributions Analyte_Method=Plutonium-238 Coprecipitation, acidified

Bias



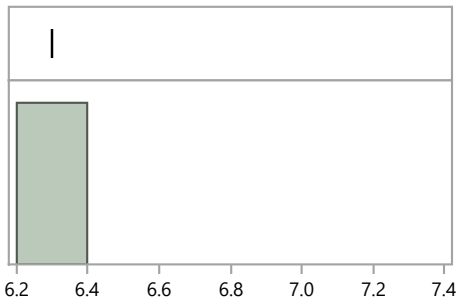
Quantiles		
100.0%	maximum	21.3
99.5%		21.3
97.5%		21.3
90.0%		21.3
75.0%	quartile	21.3
50.0%	median	21.3
25.0%	quartile	21.3
10.0%		21.3
2.5%		21.3
0.5%		21.3
0.0%	minimum	21.3

Summary Statistics	
Mean	21.3
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

MaS50 Distribution by Preparation Method

Distributions Analyte_Method=Plutonium-238 EPA 907, Actinide Elements, 600/4/80-032

Bias

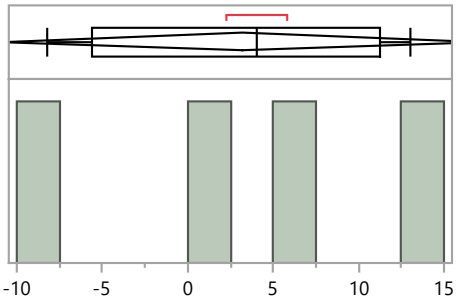


Quantiles		
100.0%	maximum	6.3
99.5%		6.3
97.5%		6.3
90.0%		6.3
75.0%	quartile	6.3
50.0%	median	6.3
25.0%	quartile	6.3
10.0%		6.3
2.5%		6.3
0.5%		6.3
0.0%	minimum	6.3

Summary Statistics	
Mean	6.3
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

Distributions Analyte_Method=Plutonium-238 Other

Bias

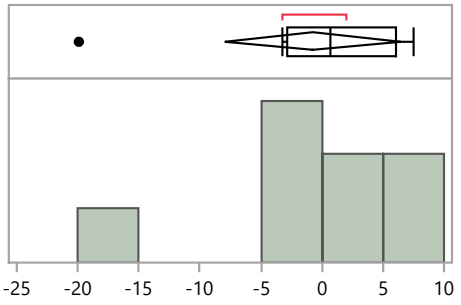


Quantiles		
100.0%	maximum	13.0
99.5%		13.0
97.5%		13.0
90.0%		13.0
75.0%	quartile	11.2
50.0%	median	4.1
25.0%	quartile	-5.6
10.0%		-8.2
2.5%		-8.2
0.5%		-8.2
0.0%	minimum	-8.2

Summary Statistics	
Mean	3.2
Std Dev	8.8
Std Err Mean	4.4
Upper 95% Mean	17.3
Lower 95% Mean	-10.8
N	4.0

Distributions Analyte_Method=Plutonium-238 Total dissolution by fusion

Bias



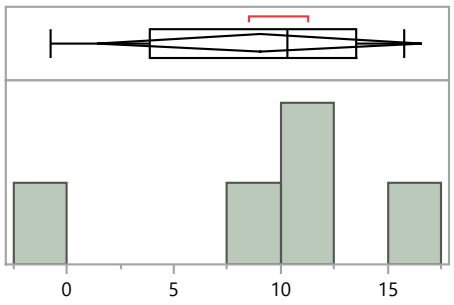
Quantiles		
100.0%	maximum	7.5
99.5%		7.5
97.5%		7.5
90.0%		7.5
75.0%	quartile	6.1
50.0%	median	0.7
25.0%	quartile	-2.9
10.0%		-19.9
2.5%		-19.9
0.5%		-19.9
0.0%	minimum	-19.9

Summary Statistics	
Mean	-0.7
Std Dev	8.7
Std Err Mean	3.1
Upper 95% Mean	6.5
Lower 95% Mean	-8.0
N	8.0

MaS50 Distribution by Preparation Method

Distributions Analyte_Method=Potassium-40 EPA 901.1, Gamma Emitting, 600/4-80-032

Bias

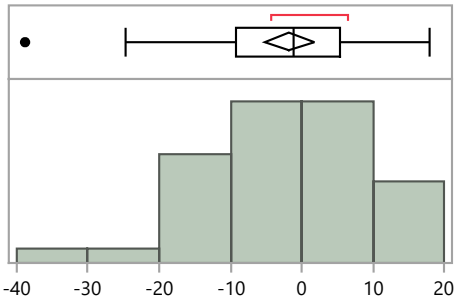


Quantiles		
100.0%	maximum	15.8
99.5%		15.8
97.5%		15.8
90.0%		15.8
75.0%	quartile	13.6
50.0%	median	10.3
25.0%	quartile	3.9
10.0%		-0.8
2.5%		-0.8
0.5%		-0.8
0.0%	minimum	-0.8

Summary Statistics	
Mean	9.0
Std Dev	6.1
Std Err Mean	2.7
Upper 95% Mean	16.6
Lower 95% Mean	1.4
N	5.0

Distributions Analyte_Method=Potassium-40 No preparation - analyzed as received

Bias

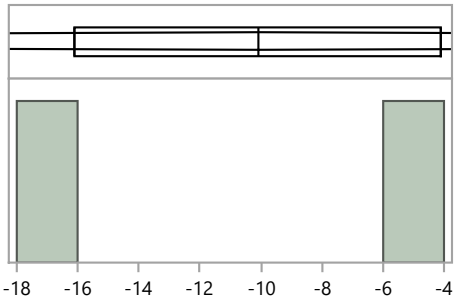


Quantiles		
100.0%	maximum	17.9
99.5%		17.9
97.5%		17.8
90.0%		10.9
75.0%	quartile	5.4
50.0%	median	-1.1
25.0%	quartile	-9.3
10.0%		-13.4
2.5%		-38.4
0.5%		-38.8
0.0%	minimum	-38.8

Summary Statistics	
Mean	-1.7
Std Dev	10.7
Std Err Mean	1.7
Upper 95% Mean	1.7
Lower 95% Mean	-5.2
N	40.0

Distributions Analyte_Method=Strontium-90 Acid dissolution with hydrofluoric acid

Bias



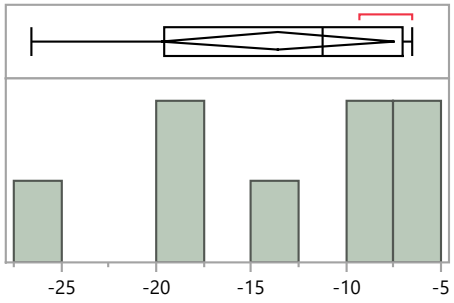
Quantiles		
100.0%	maximum	-4.1
99.5%		-4.1
97.5%		-4.1
90.0%		-4.1
75.0%	quartile	-4.1
50.0%	median	-10.1
25.0%	quartile	-16.1
10.0%		-16.1
2.5%		-16.1
0.5%		-16.1
0.0%	minimum	-16.1

Summary Statistics	
Mean	-10.1
Std Dev	8.5
Std Err Mean	6.0
Upper 95% Mean	66.1
Lower 95% Mean	-86.3
N	2.0

MaS50 Distribution by Preparation Method

Distributions Analyte_Method=Strontium-90 Acid leaching without hydrofluoric acid

Bias

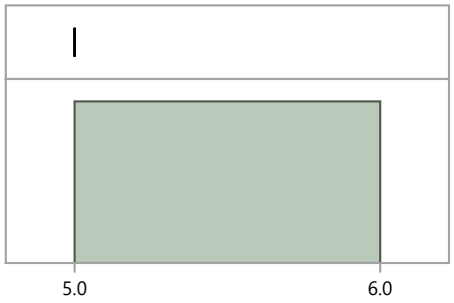


Quantiles		
100.0%	maximum	-6.5
99.5%		-6.5
97.5%		-6.5
90.0%		-6.5
75.0%	quartile	-7.0
50.0%	median	-11.3
25.0%	quartile	-19.6
10.0%		-26.6
2.5%		-26.6
0.5%		-26.6
0.0%	minimum	-26.6

Summary Statistics	
Mean	-13.6
Std Dev	7.4
Std Err Mean	2.6
Upper 95% Mean	-7.4
Lower 95% Mean	-19.7
N	8.0

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

Bias

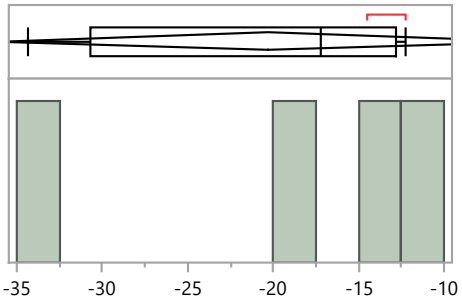


Quantiles		
100.0%	maximum	5.0
99.5%		5.0
97.5%		5.0
90.0%		5.0
75.0%	quartile	5.0
50.0%	median	5.0
25.0%	quartile	5.0
10.0%		5.0
2.5%		5.0
0.5%		5.0
0.0%	minimum	5.0

Summary Statistics	
Mean	5.0
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

Distributions Analyte_Method=Strontium-90 Other

Bias



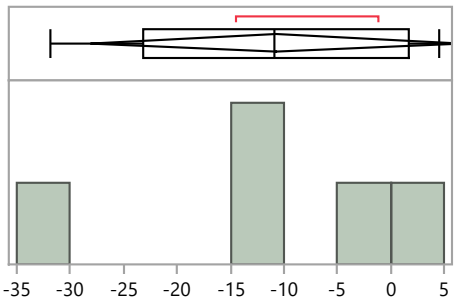
Quantiles		
100.0%	maximum	-12.3
99.5%		-12.3
97.5%		-12.3
90.0%		-12.3
75.0%	quartile	-12.9
50.0%	median	-17.3
25.0%	quartile	-30.7
10.0%		-34.3
2.5%		-34.3
0.5%		-34.3
0.0%	minimum	-34.3

Summary Statistics	
Mean	-20.3
Std Dev	9.9
Std Err Mean	4.9
Upper 95% Mean	-4.5
Lower 95% Mean	-36.0
N	4.0

MaS50 Distribution by Preparation Method

Distributions Analyte_Method=Strontium-90 Total dissolution by fusion

Bias

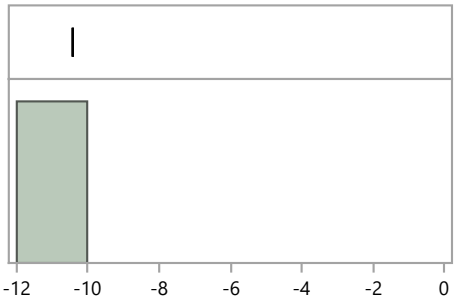


Quantiles		
100.0%	maximum	4.5
99.5%		4.5
97.5%		4.5
90.0%		4.5
75.0%	quartile	1.7
50.0%	median	-10.9
25.0%	quartile	-23.2
10.0%		-31.8
2.5%		-31.8
0.5%		-31.8
0.0%	minimum	-31.8

Summary Statistics	
Mean	-10.8
Std Dev	14.0
Std Err Mean	6.3
Upper 95% Mean	6.6
Lower 95% Mean	-28.1
N	5.0

Distributions Analyte_Method=Technetium-99 Acid dissolution with hydrofluoric acid

Bias

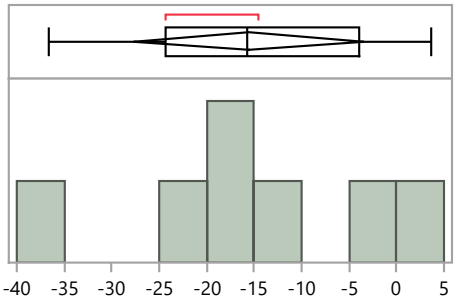


Quantiles		
100.0%	maximum	-10.4
99.5%		-10.4
97.5%		-10.4
90.0%		-10.4
75.0%	quartile	-10.4
50.0%	median	-10.4
25.0%	quartile	-10.4
10.0%		-10.4
2.5%		-10.4
0.5%		-10.4
0.0%	minimum	-10.4

Summary Statistics	
Mean	-10.4
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

Distributions Analyte_Method=Technetium-99 Acid leaching without hydrofluoric acid

Bias



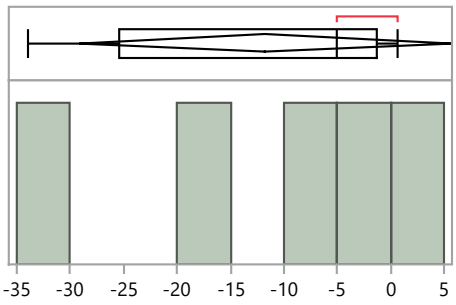
Quantiles		
100.0%	maximum	3.6
99.5%		3.6
97.5%		3.6
90.0%		3.6
75.0%	quartile	-3.9
50.0%	median	-15.8
25.0%	quartile	-24.4
10.0%		-36.6
2.5%		-36.6
0.5%		-36.6
0.0%	minimum	-36.6

Summary Statistics	
Mean	-15.6
Std Dev	13.1
Std Err Mean	4.9
Upper 95% Mean	-3.5
Lower 95% Mean	-27.7
N	7.0

MaS50 Distribution by Preparation Method

Distributions Analyte_Method=Technetium-99 Other

Bias

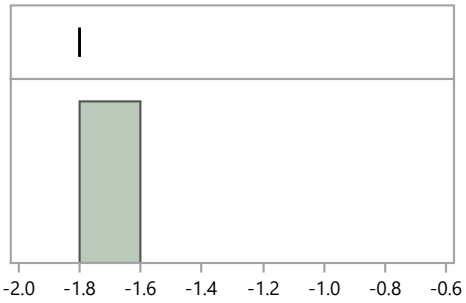


Quantiles		
100.0%	maximum	0.7
99.5%		0.7
97.5%		0.7
90.0%		0.7
75.0%	quartile	-1.3
50.0%	median	-5.1
25.0%	quartile	-25.5
10.0%		-33.9
2.5%		-33.9
0.5%		-33.9
0.0%	minimum	-33.9

Summary Statistics	
Mean	-11.7
Std Dev	14.0
Std Err Mean	6.3
Upper 95% Mean	5.7
Lower 95% Mean	-29.2
N	5.0

Distributions Analyte_Method=Technetium-99 Total dissolution by fusion

Bias

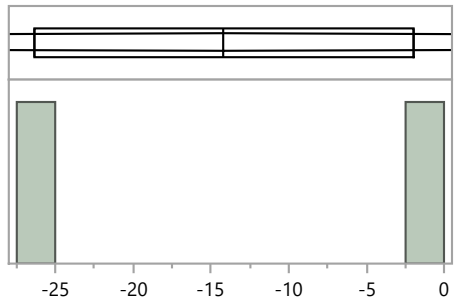


Quantiles		
100.0%	maximum	-1.8
99.5%		-1.8
97.5%		-1.8
90.0%		-1.8
75.0%	quartile	-1.8
50.0%	median	-1.8
25.0%	quartile	-1.8
10.0%		-1.8
2.5%		-1.8
0.5%		-1.8
0.0%	minimum	-1.8

Summary Statistics	
Mean	-1.8
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

Distributions Analyte_Method=Thorium-228 Acid dissolution with hydrofluoric acid

Bias



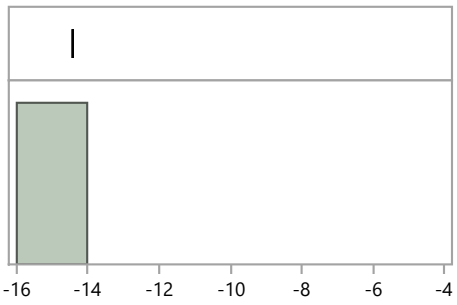
Quantiles		
100.0%	maximum	-2.0
99.5%		-2.0
97.5%		-2.0
90.0%		-2.0
75.0%	quartile	-2.0
50.0%	median	-14.2
25.0%	quartile	-26.4
10.0%		-26.4
2.5%		-26.4
0.5%		-26.4
0.0%	minimum	-26.4

Summary Statistics	
Mean	-14.2
Std Dev	17.3
Std Err Mean	12.2
Upper 95% Mean	140.8
Lower 95% Mean	-169.2
N	2.0

MaS50 Distribution by Preparation Method

Distributions Analyte_Method=Thorium-228 Acid leaching without hydrofluoric acid

Bias

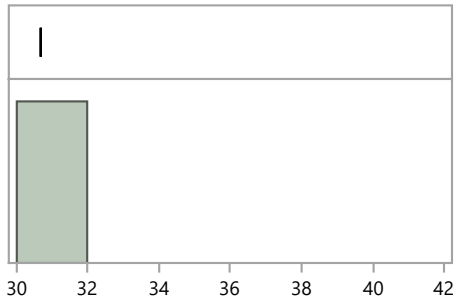


Quantiles		
100.0%	maximum	-14.4
99.5%		-14.4
97.5%		-14.4
90.0%		-14.4
75.0%	quartile	-14.4
50.0%	median	-14.4
25.0%	quartile	-14.4
10.0%		-14.4
2.5%		-14.4
0.5%		-14.4
0.0%	minimum	-14.4

Summary Statistics	
Mean	-14.4
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

Distributions Analyte_Method=Thorium-228 EPA 907, Actinide Elements, 600/4/80-032

Bias

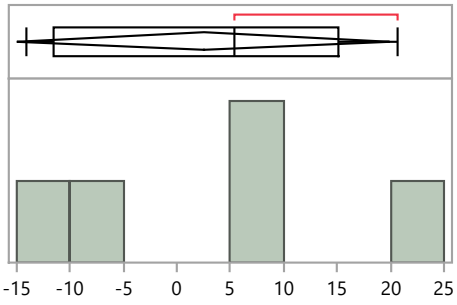


Quantiles		
100.0%	maximum	30.7
99.5%		30.7
97.5%		30.7
90.0%		30.7
75.0%	quartile	30.7
50.0%	median	30.7
25.0%	quartile	30.7
10.0%		30.7
2.5%		30.7
0.5%		30.7
0.0%	minimum	30.7

Summary Statistics	
Mean	30.7
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

Distributions Analyte_Method=Thorium-228 Other

Bias



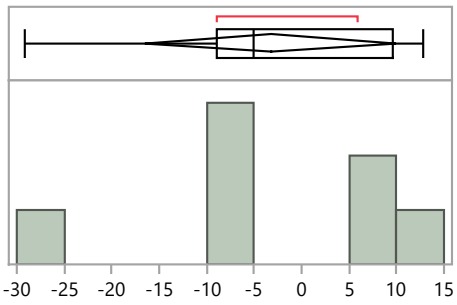
Quantiles		
100.0%	maximum	20.7
99.5%		20.7
97.5%		20.7
90.0%		20.7
75.0%	quartile	15.1
50.0%	median	5.3
25.0%	quartile	-11.6
10.0%		-14.1
2.5%		-14.1
0.5%		-14.1
0.0%	minimum	-14.1

Summary Statistics	
Mean	2.5
Std Dev	14.1
Std Err Mean	6.3
Upper 95% Mean	20.0
Lower 95% Mean	-15.0
N	5.0

MaS50 Distribution by Preparation Method

Distributions Analyte_Method=Thorium-228 Total dissolution by fusion

Bias

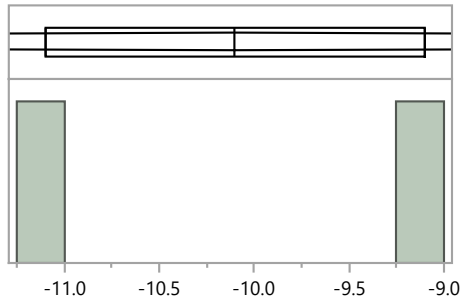


Quantiles		
100.0%	maximum	12.7
99.5%		12.7
97.5%		12.7
90.0%		12.7
75.0%	quartile	9.6
50.0%	median	-5.1
25.0%	quartile	-9.0
10.0%		-29.1
2.5%		-29.1
0.5%		-29.1
0.0%	minimum	-29.1

Summary Statistics	
Mean	-3.3
Std Dev	14.3
Std Err Mean	5.4
Upper 95% Mean	10.0
Lower 95% Mean	-16.5
N	7.0

Distributions Analyte_Method=Thorium-230 Acid dissolution with hydrofluoric acid

Bias

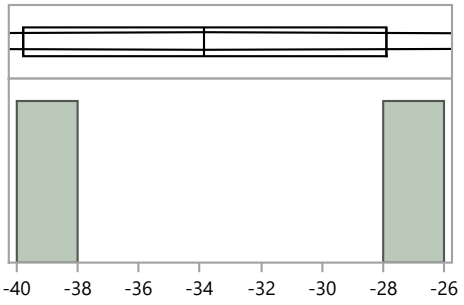


Quantiles		
100.0%	maximum	-9.1
99.5%		-9.1
97.5%		-9.1
90.0%		-9.1
75.0%	quartile	-9.1
50.0%	median	-10.1
25.0%	quartile	-11.1
10.0%		-11.1
2.5%		-11.1
0.5%		-11.1
0.0%	minimum	-11.1

Summary Statistics	
Mean	-10.1
Std Dev	1.4
Std Err Mean	1.0
Upper 95% Mean	2.6
Lower 95% Mean	-22.8
N	2.0

Distributions Analyte_Method=Thorium-230 Acid leaching without hydrofluoric acid

Bias



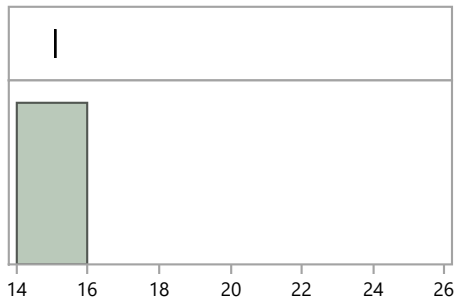
Quantiles		
100.0%	maximum	-27.9
99.5%		-27.9
97.5%		-27.9
90.0%		-27.9
75.0%	quartile	-27.9
50.0%	median	-33.9
25.0%	quartile	-39.8
10.0%		-39.8
2.5%		-39.8
0.5%		-39.8
0.0%	minimum	-39.8

Summary Statistics	
Mean	-33.9
Std Dev	8.4
Std Err Mean	6.0
Upper 95% Mean	41.8
Lower 95% Mean	-109.5
N	2.0

MaS50 Distribution by Preparation Method

Distributions Analyte_Method=Thorium-230 EPA 907, Actinide Elements, 600/4/80-032

Bias

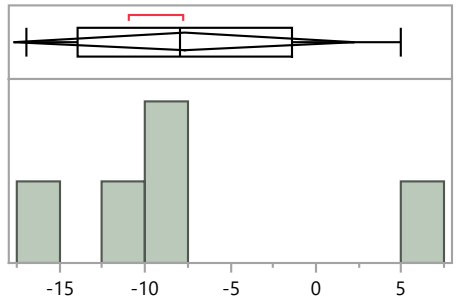


Quantiles		
100.0%	maximum	15.1
99.5%		15.1
97.5%		15.1
90.0%		15.1
75.0%	quartile	15.1
50.0%	median	15.1
25.0%	quartile	15.1
10.0%		15.1
2.5%		15.1
0.5%		15.1
0.0%	minimum	15.1

Summary Statistics	
Mean	15.1
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

Distributions Analyte_Method=Thorium-230 Other

Bias

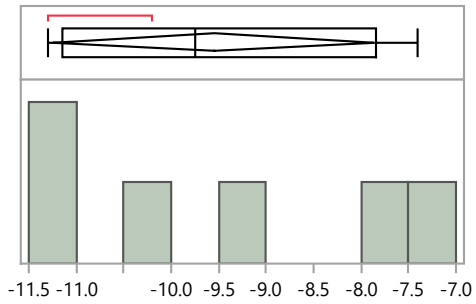


Quantiles		
100.0%	maximum	5.0
99.5%		5.0
97.5%		5.0
90.0%		5.0
75.0%	quartile	-1.4
50.0%	median	-7.9
25.0%	quartile	-13.9
10.0%		-16.9
2.5%		-16.9
0.5%		-16.9
0.0%	minimum	-16.9

Summary Statistics	
Mean	-7.7
Std Dev	8.0
Std Err Mean	3.6
Upper 95% Mean	2.2
Lower 95% Mean	-17.6
N	5.0

Distributions Analyte_Method=Thorium-230 Total dissolution by fusion

Bias



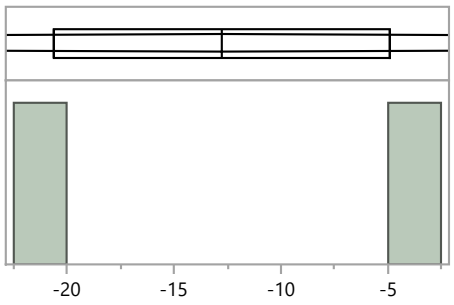
Quantiles		
100.0%	maximum	-7.4
99.5%		-7.4
97.5%		-7.4
90.0%		-7.4
75.0%	quartile	-7.9
50.0%	median	-9.8
25.0%	quartile	-11.2
10.0%		-11.3
2.5%		-11.3
0.5%		-11.3
0.0%	minimum	-11.3

Summary Statistics	
Mean	-9.6
Std Dev	1.6
Std Err Mean	0.7
Upper 95% Mean	-7.9
Lower 95% Mean	-11.2
N	6.0

MaS50 Distribution by Preparation Method

Distributions Analyte_Method=Thorium-232 Acid dissolution with hydrofluoric acid

Bias

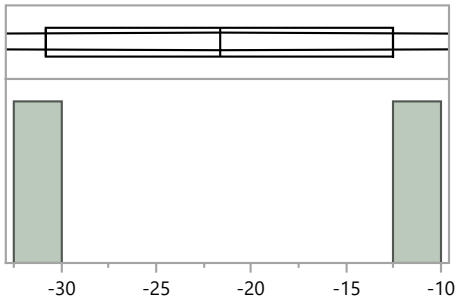


Quantiles		
100.0%	maximum	-4.9
99.5%		-4.9
97.5%		-4.9
90.0%		-4.9
75.0%	quartile	-4.9
50.0%	median	-12.8
25.0%	quartile	-20.6
10.0%		-20.6
2.5%		-20.6
0.5%		-20.6
0.0%	minimum	-20.6

Summary Statistics	
Mean	-12.8
Std Dev	11.1
Std Err Mean	7.9
Upper 95% Mean	87.0
Lower 95% Mean	-112.5
N	2.0

Distributions Analyte_Method=Thorium-232 Acid leaching without hydrofluoric acid

Bias

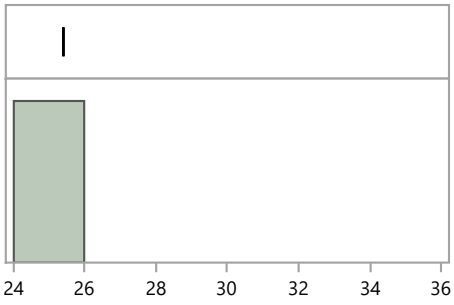


Quantiles		
100.0%	maximum	-12.5
99.5%		-12.5
97.5%		-12.5
90.0%		-12.5
75.0%	quartile	-12.5
50.0%	median	-21.7
25.0%	quartile	-30.8
10.0%		-30.8
2.5%		-30.8
0.5%		-30.8
0.0%	minimum	-30.8

Summary Statistics	
Mean	-21.7
Std Dev	12.9
Std Err Mean	9.2
Upper 95% Mean	94.6
Lower 95% Mean	-137.9
N	2.0

Distributions Analyte_Method=Thorium-232 EPA 907, Actinide Elements, 600/4/80-032

Bias



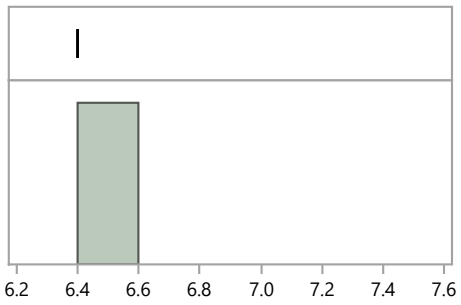
Quantiles		
100.0%	maximum	25.4
99.5%		25.4
97.5%		25.4
90.0%		25.4
75.0%	quartile	25.4
50.0%	median	25.4
25.0%	quartile	25.4
10.0%		25.4
2.5%		25.4
0.5%		25.4
0.0%	minimum	25.4

Summary Statistics	
Mean	25.4
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

MaS50 Distribution by Preparation Method

Distributions Analyte_Method=Thorium-232 No preparation - analyzed as received

Bias

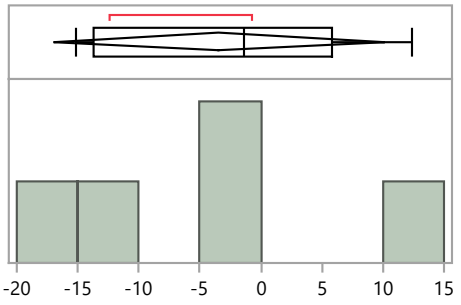


Quantiles		
100.0%	maximum	6.4
99.5%		6.4
97.5%		6.4
90.0%		6.4
75.0%	quartile	6.4
50.0%	median	6.4
25.0%	quartile	6.4
10.0%		6.4
2.5%		6.4
0.5%		6.4
0.0%	minimum	6.4

Summary Statistics	
Mean	6.4
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

Distributions Analyte_Method=Thorium-232 Other

Bias

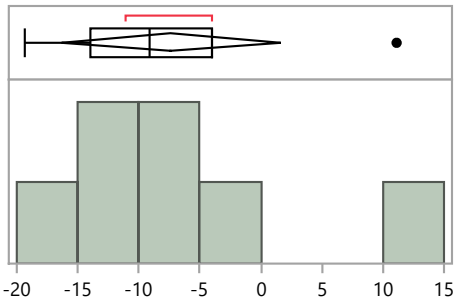


Quantiles		
100.0%	maximum	12.4
99.5%		12.4
97.5%		12.4
90.0%		12.4
75.0%	quartile	5.9
50.0%	median	-1.4
25.0%	quartile	-13.8
10.0%		-15.1
2.5%		-15.1
0.5%		-15.1
0.0%	minimum	-15.1

Summary Statistics	
Mean	-3.4
Std Dev	10.9
Std Err Mean	4.9
Upper 95% Mean	10.1
Lower 95% Mean	-17.0
N	5.0

Distributions Analyte_Method=Thorium-232 Total dissolution by fusion

Bias



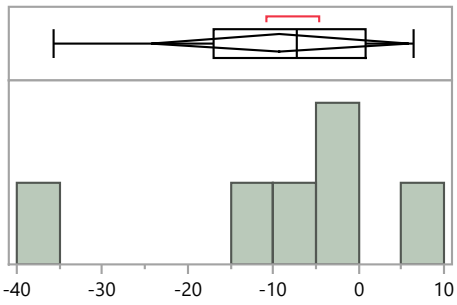
Quantiles		
100.0%	maximum	11.1
99.5%		11.1
97.5%		11.1
90.0%		11.1
75.0%	quartile	-4.0
50.0%	median	-9.1
25.0%	quartile	-14.0
10.0%		-19.3
2.5%		-19.3
0.5%		-19.3
0.0%	minimum	-19.3

Summary Statistics	
Mean	-7.4
Std Dev	9.7
Std Err Mean	3.7
Upper 95% Mean	1.6
Lower 95% Mean	-16.3
N	7.0

MaS50 Distribution by Preparation Method

Distributions Analyte_Method=Uranium-234 Acid dissolution with hydrofluoric acid

Bias

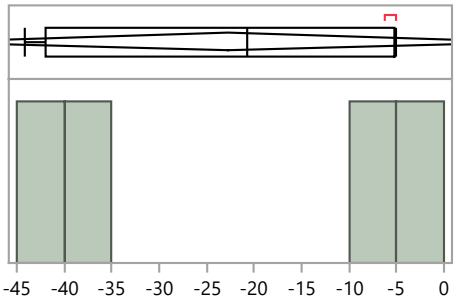


Quantiles		
100.0%	maximum	6.4
99.5%		6.4
97.5%		6.4
90.0%		6.4
75.0%	quartile	0.9
50.0%	median	-7.2
25.0%	quartile	-17.0
10.0%		-35.7
2.5%		-35.7
0.5%		-35.7
0.0%	minimum	-35.7

Summary Statistics	
Mean	-9.2
Std Dev	14.4
Std Err Mean	5.9
Upper 95% Mean	5.9
Lower 95% Mean	-24.3
N	6.0

Distributions Analyte_Method=Uranium-234 Acid leaching without hydrofluoric acid

Bias

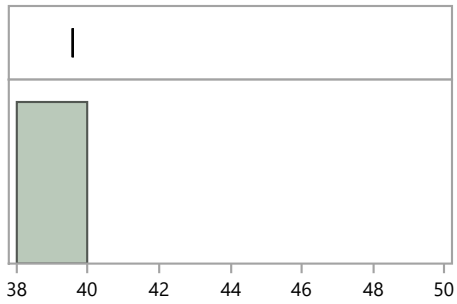


Quantiles		
100.0%	maximum	-5.0
99.5%		-5.0
97.5%		-5.0
90.0%		-5.0
75.0%	quartile	-5.3
50.0%	median	-20.8
25.0%	quartile	-42.0
10.0%		-44.2
2.5%		-44.2
0.5%		-44.2
0.0%	minimum	-44.2

Summary Statistics	
Mean	-22.7
Std Dev	20.0
Std Err Mean	10.0
Upper 95% Mean	9.2
Lower 95% Mean	-54.5
N	4.0

Distributions Analyte_Method=Uranium-234 Coprecipitation, acidified

Bias



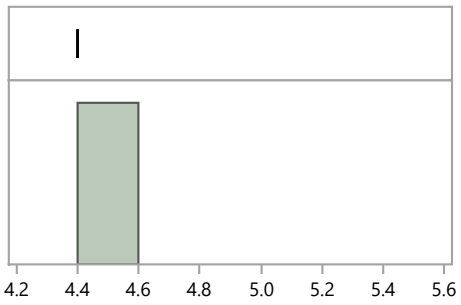
Quantiles		
100.0%	maximum	39.6
99.5%		39.6
97.5%		39.6
90.0%		39.6
75.0%	quartile	39.6
50.0%	median	39.6
25.0%	quartile	39.6
10.0%		39.6
2.5%		39.6
0.5%		39.6
0.0%	minimum	39.6

Summary Statistics	
Mean	39.6
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

MaS50 Distribution by Preparation Method

Distributions Analyte_Method=Uranium-234 EPA 908, Uranium-Radiochemical Method, 600/4/80-032

Bias

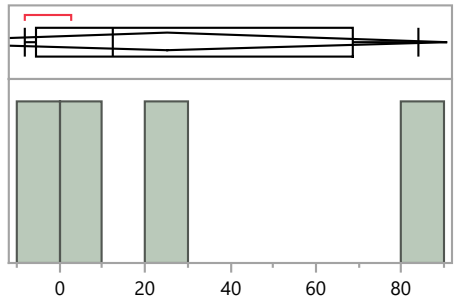


Quantiles		
100.0%	maximum	4.4
99.5%		4.4
97.5%		4.4
90.0%		4.4
75.0%	quartile	4.4
50.0%	median	4.4
25.0%	quartile	4.4
10.0%		4.4
2.5%		4.4
0.5%		4.4
0.0%	minimum	4.4

Summary Statistics	
Mean	4.4
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

Distributions Analyte_Method=Uranium-234 Other

Bias

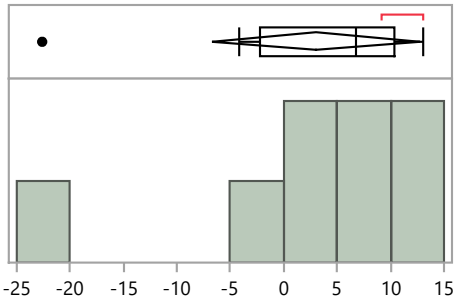


Quantiles		
100.0%	maximum	83.8
99.5%		83.8
97.5%		83.8
90.0%		83.8
75.0%	quartile	68.5
50.0%	median	12.6
25.0%	quartile	-5.4
10.0%		-8.1
2.5%		-8.1
0.5%		-8.1
0.0%	minimum	-8.1

Summary Statistics	
Mean	25.2
Std Dev	41.1
Std Err Mean	20.5
Upper 95% Mean	90.5
Lower 95% Mean	-40.1
N	4.0

Distributions Analyte_Method=Uranium-234 Total dissolution by fusion

Bias



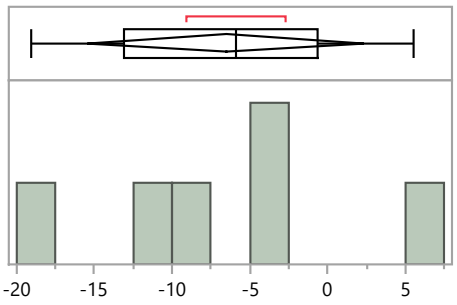
Quantiles		
100.0%	maximum	13.0
99.5%		13.0
97.5%		13.0
90.0%		13.0
75.0%	quartile	10.4
50.0%	median	6.8
25.0%	quartile	-2.2
10.0%		-22.6
2.5%		-22.6
0.5%		-22.6
0.0%	minimum	-22.6

Summary Statistics	
Mean	3.0
Std Dev	11.7
Std Err Mean	4.1
Upper 95% Mean	12.7
Lower 95% Mean	-6.8
N	8.0

MaS50 Distribution by Preparation Method

Distributions Analyte_Method=Uranium-238 Acid dissolution with hydrofluoric acid

Bias

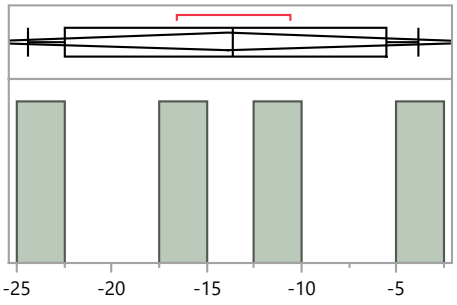


Quantiles		
100.0%	maximum	5.5
99.5%		5.5
97.5%		5.5
90.0%		5.5
75.0%	quartile	-0.7
50.0%	median	-5.9
25.0%	quartile	-13.1
10.0%		-19.1
2.5%		-19.1
0.5%		-19.1
0.0%	minimum	-19.1

Summary Statistics	
Mean	-6.5
Std Dev	8.5
Std Err Mean	3.5
Upper 95% Mean	2.4
Lower 95% Mean	-15.4
N	6.0

Distributions Analyte_Method=Uranium-238 Acid leaching without hydrofluoric acid

Bias

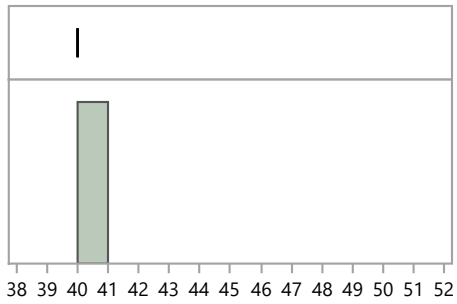


Quantiles		
100.0%	maximum	-3.9
99.5%		-3.9
97.5%		-3.9
90.0%		-3.9
75.0%	quartile	-5.6
50.0%	median	-13.6
25.0%	quartile	-22.4
10.0%		-24.4
2.5%		-24.4
0.5%		-24.4
0.0%	minimum	-24.4

Summary Statistics	
Mean	-13.9
Std Dev	8.7
Std Err Mean	4.4
Upper 95% Mean	0.0
Lower 95% Mean	-27.8
N	4.0

Distributions Analyte_Method=Uranium-238 Coprecipitation, acidified

Bias



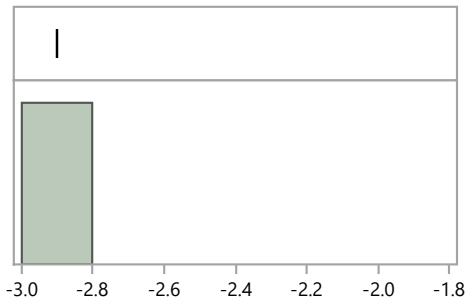
Quantiles		
100.0%	maximum	40.0
99.5%		40.0
97.5%		40.0
90.0%		40.0
75.0%	quartile	40.0
50.0%	median	40.0
25.0%	quartile	40.0
10.0%		40.0
2.5%		40.0
0.5%		40.0
0.0%	minimum	40.0

Summary Statistics	
Mean	40.0
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

MaS50 Distribution by Preparation Method

Distributions Analyte_Method=Uranium-238 EPA 908, Uranium-Radiochemical Method, 600/4/80-032

Bias

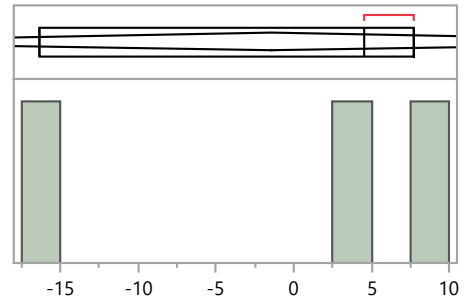


Quantiles		
100.0%	maximum	-2.9
99.5%		-2.9
97.5%		-2.9
90.0%		-2.9
75.0%	quartile	-2.9
50.0%	median	-2.9
25.0%	quartile	-2.9
10.0%		-2.9
2.5%		-2.9
0.5%		-2.9
0.0%	minimum	-2.9

Summary Statistics	
Mean	-2.9
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

Distributions Analyte_Method=Uranium-238 No preparation - analyzed as received

Bias

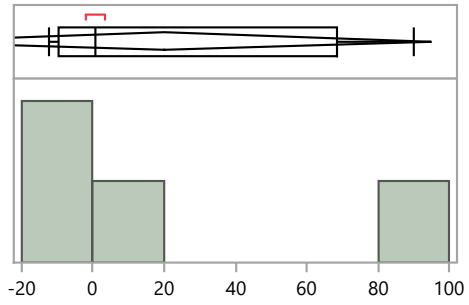


Quantiles		
100.0%	maximum	7.7
99.5%		7.7
97.5%		7.7
90.0%		7.7
75.0%	quartile	7.7
50.0%	median	4.5
25.0%	quartile	-16.4
10.0%		-16.4
2.5%		-16.4
0.5%		-16.4
0.0%	minimum	-16.4

Summary Statistics	
Mean	-1.4
Std Dev	13.1
Std Err Mean	7.6
Upper 95% Mean	31.1
Lower 95% Mean	-33.9
N	3.0

Distributions Analyte_Method=Uranium-238 Other

Bias



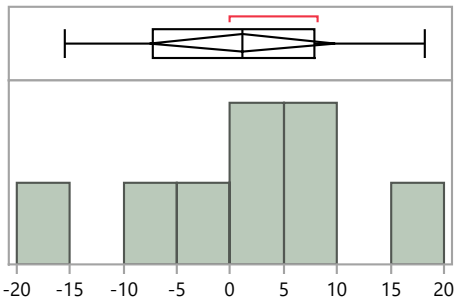
Quantiles		
100.0%	maximum	90.0
99.5%		90.0
97.5%		90.0
90.0%		90.0
75.0%	quartile	68.4
50.0%	median	0.9
25.0%	quartile	-9.5
10.0%		-12.1
2.5%		-12.1
0.5%		-12.1
0.0%	minimum	-12.1

Summary Statistics	
Mean	19.9
Std Dev	47.2
Std Err Mean	23.6
Upper 95% Mean	95.0
Lower 95% Mean	-55.1
N	4.0

MaS50 Distribution by Preparation Method

Distributions Analyte_Method=Uranium-238 Total dissolution by fusion

Bias

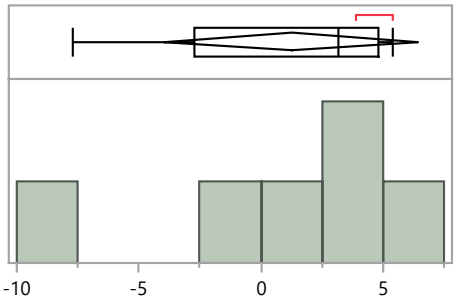


Quantiles		
100.0%	maximum	18.2
99.5%		18.2
97.5%		18.2
90.0%		18.2
75.0%	quartile	7.8
50.0%	median	1.1
25.0%	quartile	-7.3
10.0%		-15.5
2.5%		-15.5
0.5%		-15.5
0.0%	minimum	-15.5

Summary Statistics	
Mean	1.1
Std Dev	10.5
Std Err Mean	3.7
Upper 95% Mean	9.9
Lower 95% Mean	-7.6
N	8.0

Distributions Analyte_Method=Zinc-65 EPA 901.1, Gamma Emitting, 600/4-80-032

Bias

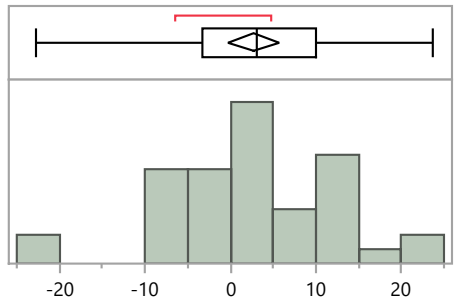


Quantiles		
100.0%	maximum	5.4
99.5%		5.4
97.5%		5.4
90.0%		5.4
75.0%	quartile	4.8
50.0%	median	3.2
25.0%	quartile	-2.8
10.0%		-7.7
2.5%		-7.7
0.5%		-7.7
0.0%	minimum	-7.7

Summary Statistics	
Mean	1.3
Std Dev	4.9
Std Err Mean	2.0
Upper 95% Mean	6.4
Lower 95% Mean	-3.9
N	6.0

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

Bias



Quantiles		
100.0%	maximum	23.7
99.5%		23.7
97.5%		23.3
90.0%		14.1
75.0%	quartile	10.0
50.0%	median	3.1
25.0%	quartile	-3.3
10.0%		-9.5
2.5%		-22.6
0.5%		-22.8
0.0%	minimum	-22.8

Summary Statistics	
Mean	2.7
Std Dev	9.8
Std Err Mean	1.5
Upper 95% Mean	5.8
Lower 95% Mean	-0.3
N	43.0