

## **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.

## MaW45 Participating Laboratories

<b>Lab Code</b>	<b>Lab Name</b>	<b>Matrix Code</b>
ADEM01	Alabama Department of Environmental Management	MaW
AFOH01	USAFSAM/OEA	MaW
ANLB01	Argonne National Laboratory	MaW
ANTE01	ALS Environmental - Fort Collins, CO	MaW
AREV01	Framatome - CMC	MaW
ARGO01	Idaho National Laboratory	MaW
ARPL01	Analytical Support Operations - Radiochemical Processing Lab	MaW
ARSL01	ARS Aleut Analytical, LLC	MaW
ASUK99	AWE (Aldermaston)	MaW
AY1201	Consolidated Nuclear Security, LLC, ACO Laboratory	MaW
BY1201	Consolidated Nuclear Security, LLC, ACO, Production Laboratory	MaW
CESL01	Lawrence Livermore National Laboratory - EMRL	MaW
DEHS01	Department of Environmental Health & Safety	MaW
EFGS01	Eurofins Frontier Global Sciences, LLC.	MaW
ELIW01	Energy Laboratories, Inc.	MaW
ERAD01	Lawrence Livermore National Laboratory ERAD	MaW
ERCL01	Washington State Public Health Laboratories	MaW
ERHD99	National Monitoring Section, Radiation Protection Bureau, Health Canada	MaW
ESDE01	Region 5 EQC Tritium Lab	MaW
ETTP01	MCLinc	MaW
EULC01	EnergySolutions, LLC	MaW
FDHE01	Florida Dept of Health Environmental Laboratory	MaW
FDOH01	Florida Dept. of Health, Mobile Environmental Radiological Lab	MaW
FERM01	Fernald Project	MaW
FNAL01	Fermi National Accelerator Laboratory (FermiLab)	MaW
FSCL01	Forensic Science Center Lawrence Livermore Laboratory	MaW
GENE01	GEL Laboratories, LLC	MaW
GPCL01	Georgia Power Company Environmental Laboratory	MaW
HCAL01	Lawrence Livermore National Laboratory	MaW
HECR01	SC Dept. Health and Environmental Control Radiological Laboratory	MaW
HPAC99	PHE, CRCE Glasgow	MaW
IAEA99	International Atomic Energy Agency	MaW
IEMA01	Illinois Emergency Management Agency Radiochemistry Laboratory	MaW
ISUE01	ISU Environmental Monitoring Laboratory	MaW
ISUP01	ISU - Department of Physics/Health Physics/EAL	MaW
JAEC99	Research Laboratories and Information Directorate	MaW
JLNN01	Jefferson Laboratory	MaW
LANL01	Los Alamos National Laboratory	MaW
LAWR01	LAWRENCE BERKELEY NATIONAL LABORATORY	MaW
LOCK03	Advanced Test Reactor (ATR) Complex Radioanalytical Laboratory	MaW
LZCA01	ACZ Laboratories, Inc	MaW
MART03	Radioactive Material Analysis Laboratory	MaW
MDPH01	MDPH-Radiation Control Program	MaW
MNDH01	Minnesota Department of Health, Public Health Lab. Division	MaW

NARL01	National Analytical Radiation Environmental Laboratory	MaW
NARL02	USEPA - NAREL - MERL	MaW
NESI01	BWXT-Radioisotope & Analytical Chemistry Laboratory	MaW
NJDH01	New Jersey Dept. of Health, PHEL, ECLS	MaW
ODHL01	Ohio Department of Health Laboratory	MaW
ORIS01	ORISE/IEAV	MaW
OTLI01	Pace Analytical National Center for Testing & Innovation	MaW
QUAN02	Eurofins TestAmerica Knoxville	MaW
RJLG01	RJ Lee Group - Columbia Basin Analytical Laboratories (CBAL)	MaW
RPSC01	Radiation Protection Service	MaW
SANC99	RadioAnalysis, South Africa Nuclear Energy Corp.	MaW
SAVA01	SAVANNAH RIVER NUCLEAR SOLUTIONS (SRNS)	MaW
SEML01	SRS Environmental Monitoring Laboratory	MaW
SLAC01	SLAC DOE National Accelerator Laboratory	MaW
SOUT01	Southwest Research Institute	MaW
SRPD01	Sandia National Laboratories, Radiation Protection Sample Diagnostics	MaW
TDHL01	Texas Department of State Health Services Laboratory	MaW
TELE01	Teledyne Brown Engineering - Environmental Services	MaW
TELE02	ATI Environmental, Inc., Midwest Lab	MaW
TMAO01	EBERLINE Analytical Corporation	MaW
TNUT01	St. Louis USACE FUSRAP Laboratory	MaW
UNEV01	University of Nevada, Reno	MaW
UNTE01	UniTech-235	MaW
WEST04	PACE ANALYTICAL SERVICES, PITTSBURGH	MaW
WIPH01	WI, DPH, Radiation Protection Section	MaW
WIPP01	WIPP Laboratories	MaW
WSHL01	Wisconsin State Laboratory of Hygiene	MaW
WVDP01	WVDP Environmental Laboratory	MaW
YPGA01	US Army Yuma Proving Ground / Material Analysis Lab	MaW

## Laboratories Not Reporting

<b>Lab Code</b>	<b>Lab Name</b>	<b>Matrix Code</b>
ALIN01	Anatek Labs Inc.	MaW
CORE02	Eurofins TestAmerica Denver	MaW
EMAX01	EMAX Laboratories, Inc	MaW
MART01	Fluor B&W Ports Analytical Laboratory	MaW
MSDH01	Mississippi State Dept of Health	MaW

## Study Reference Values

MAPEP-21-MaW45

Radiological Reference Date: 08/01/2021

Analyte	Ref Value	Ref Unc
Inorganic Units: (mg/L)		
Antimony	7.27	0.07
Arsenic	2.46	0.05
Barium	3.18	0.06
Beryllium	4.03	0.08
Cadmium	0.468	0.009
Chromium	2.48	0.05
Cobalt	6.04	0.12
Copper	8.29	0.17
Lead	3.00	0.06
Mercury	0.128	0.003
Nickel	0.00102	0.00015
Selenium	0.411	0.008
Technetium-99	5.87E-6	1.5E-7
Thallium	3.06	0.06
Uranium-235	7.0E-6	2E-7
Uranium-238	9.9E-4	5E-5
Uranium-Total	1.00E-3	5E-5
Vanadium	10.1	0.2
Zinc	8.42	0.17

Analyte	Ref Value	Ref Unc
Radiological Units: (Bq/L)		
Americium-241	0.426	0.009
Cesium-134	10.4	0.3
Cobalt-57	13.9	0.4
Cobalt-60	14.0	0.4
Hydrogen-3	250	7
Iron-55	49.8	1.3
Manganese-54	9.0	0.2
Nickel-63	39.5	1.0
Plutonium-238	0.0096	0.0019
Plutonium-239/240	0.528	0.011
Radium-226	0.226	0.006
Strontium-90	3.86	0.10
Technetium-99	3.71	0.09
Uranium-234	0.0215	0.0011
Uranium-238	0.0123	0.0007

## Sample Statistical Summary

MAPEP-21-MaW45

Radiological Reference Date: 08/01/2021

Analyte	T(1)	A(2)	Grand(3) Mean	Std Dev	Ref Value	Ref Unc	Acceptance Range
							Units: (mg/L)
Inorganic							
Antimony	18	17	7.21	0.35	7.27	0.07	5.09 - 9.45
Arsenic	20	20	2.32	0.12	2.46	0.05	1.72 - 3.20
Barium	18	18	3.12	0.13	3.18	0.06	2.23 - 4.13
Beryllium	18	18	3.98	0.21	4.03	0.08	2.82 - 5.24
Cadmium	19	19	0.460	0.025	0.468	0.009	0.328 - 0.608
Chromium	20	20	2.49	0.10	2.48	0.05	1.74 - 3.22
Cobalt	20	20	5.96	0.26	6.04	0.12	4.23 - 7.85
Copper	19	19	8.14	0.41	8.29	0.17	5.80 - 10.78
Lead	20	20	3.01	0.16	3.00	0.06	2.10 - 3.90
Mercury	16	16	0.129	0.014	0.128	0.003	0.090 - 0.166
Nickel	18	13	0.01624	0.02932	0.00102	0.00015	Sensitivity Evaluation
Selenium	19	17	0.403	0.032	0.411	0.008	0.288 - 0.534
Technetium-99	2	2			5.87E-6	1.5E-7	4.11E-6 - 7.63E-6
Thallium	19	19	3.03	0.18	3.06	0.06	2.14 - 3.98
Uranium-235	13	13	1.77E-5	2.92E-5	7.0E-6	2E-7	Sensitivity Evaluation
Uranium-238	14	12	9.44E-4	8.80E-5	9.9E-4	5E-5	6.93E-4 - 1.29E-3
Uranium-Total	18	16	0.00097	0.00006	1.00E-3	5E-5	0.00070 - 0.00130
Vanadium	18	18	10.0	0.5	10.1	0.2	7.1 - 13.1
Zinc	20	20	8.23	0.44	8.42	0.17	5.89 - 10.95

Analyte	T(1)	A(2)	Grand(3) Mean	Std Dev	Ref Value	Ref Unc	Acceptance Range
							Units: (Bq/L)
Radiological							
Americium-241	31	26	0.410	0.048	0.426	0.009	0.298 - 0.554
Cesium-134	59	55	9.8	0.7	10.4	0.3	7.3 - 13.5
Cesium-137	53	52					False Positive Test
Cobalt-57	59	58	13.5	0.9	13.9	0.4	9.7 - 18.1
Cobalt-60	59	58	13.8	0.7	14.0	0.4	9.8 - 18.2
Hydrogen-3	39	37	252	20	250	7	175 - 325
Iron-55	5	4			49.8	1.3	34.9 - 64.7
Manganese-54	59	58	9.1	0.7	9.0	0.2	6.3 - 11.7
Nickel-63	9	7	40.0	4.1	39.5	1.0	27.7 - 51.4
Plutonium-238	27	25	0.0075	0.0049	0.0096	0.0019	Sensitivity Evaluation
Plutonium-239/240	27	24	0.466	0.038	0.528	0.011	0.370 - 0.686
Potassium-40	52	46					False Positive Test
Radium-226	23	17	0.225	0.027	0.226	0.006	0.158 - 0.294
Strontium-90	30	27	3.60	0.25	3.86	0.10	2.70 - 5.02
Technetium-99	17	11	3.60	0.30	3.71	0.09	2.60 - 4.82
Uranium-234	29	25	0.0329	0.0315	0.0215	0.0011	Sensitivity Evaluation
Uranium-238	30	28	0.0205	0.0296	0.0123	0.0007	Sensitivity Evaluation
Zinc-65	52	51					False Positive Test

**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%

NOT ACCEPTABLE.....RP > 30%

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

## Flag Summary Report

MAPEP-21-MaW45

### Inorganic

Analyte	A	W	RW	N
Antimony	17			1
Arsenic	20			
Barium	18			
Beryllium	18			
Cadmium	19			
Chromium	20			
Cobalt	20			
Copper	19			
Lead	20			
Mercury	14	2		
Nickel	13			5
Selenium	17			2
Thallium	19			
Uranium-Total	16			1
Uranium-235	13			
Uranium-238	11	1		1
Vanadium	18			
Zinc	20			
Technetium-99	2			

### Radiological

Analyte	A	W	RW	N
Americium-241	23	3		5
Cesium-134	54	1		2
Cesium-137	52			7
Cobalt-57	56	2		1
Cobalt-60	57	1		1
Hydrogen-3	35	2		2
Iron-55	3	1		1
Manganese-54	56	2		1
Nickel-63	7			2
Plutonium-238	25			2
Plutonium-239/240	20	4		3
Potassium-40	46			11
Radium-226	15	2		6
Strontium-90	26	1		3
Technetium-99	11			6
Uranium-234	25			4
Uranium-238	28			2
Zinc-65	51			7





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

*Laboratory Results For MAPEP-21-MaW45*

(ADEM01) Alabama Department of Environmental Management  
1350 Coliseum Blvd.  
Montgomery, AL 36110

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.426				0.298 - 0.554		
Cesium-134	9.6	10.4	A		-7.7	7.3 - 13.5	0.347	A
Cesium-137	NR		N	(11)		False Positive Test		
Cobalt-57	12.8	13.9	A		-7.9	9.7 - 18.1	0.2875	A
Cobalt-60	13.85	14.0	A		-1.1	9.8 - 18.2	0.2885	A
Hydrogen-3	NR	250				175 - 325		
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	8.67	9.0	A		-3.7	6.3 - 11.7	0.2605	A
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	NR	0.0096				Sensitivity Evaluation		
Plutonium-239/240	NR	0.528				0.370 - 0.686		
Potassium-40	2.08		N	(1)		False Positive Test	0.2775	
Radium-226	NR	0.226				0.158 - 0.294		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	3.86				2.70 - 5.02		
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	NR	0.0215				Sensitivity Evaluation		
Uranium-238	NR	0.0123				Sensitivity Evaluation		
Zinc-65	NR		N	(11)		False Positive Test		

Radiological Reference Date: August 1, 2021

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



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

*Laboratory Results For MAPEP-21-MaW45*

(AFOH01) USAFSAM/OEA

2510 Fifth Street, Area B

Wright-Patterson AFB, OH 45433-7913

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.389	0.426	A		-8.7	0.298 - 0.554	0.015	A
Cesium-134	9.60	10.4	A		-7.7	7.3 - 13.5	0.30	A
Cesium-137	-0.10			A		False Positive Test	0.06	
Cobalt-57	12.42	13.9	A		-10.6	9.7 - 18.1	0.40	A
Cobalt-60	13.14	14.0	A		-6.1	9.8 - 18.2	0.32	A
Hydrogen-3	253	250	A		1.2	175 - 325	20	A
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	8.34	9.0	A		-7.3	6.3 - 11.7	0.25	A
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	0.00667	0.0096	A			Sensitivity Evaluation	0.00090	
Plutonium-239/240	0.493	0.528	A		-6.6	0.370 - 0.686	0.018	A
Potassium-40	-0.74			A		False Positive Test	0.42	
Radium-226	0.231	0.226	A		2.2	0.158 - 0.294	0.017	A

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	3.34	3.86	A		-13.5	2.70 - 5.02	0.15	A
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	0.0223	0.0215	A			Sensitivity Evaluation	0.0017	
Uranium-238	0.0114	0.0123	A			Sensitivity Evaluation	0.0012	
Zinc-65	-0.16		A			False Positive Test	0.14	

Radiological Reference Date: August 1, 2021

**Results Flags:**

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



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

*Laboratory Results For MAPEP-21-MaW45*

(ANLB01) Argonne National Laboratory

9700 S. Cass Ave

Argonne, IL 60439

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.363	0.426	A		-14.8	0.298 - 0.554	0.030	A
Cesium-134	10.27	10.4	A		-1.3	7.3 - 13.5	0.99	A
Cesium-137	0.15		A			False Positive Test	0.194	
Cobalt-57	13.66	13.9	A		-1.7	9.7 - 18.1	0.36	A
Cobalt-60	14.03	14.0	A		0.2	9.8 - 18.2	0.82	A
Hydrogen-3	266.2	250	A		6.5	175 - 325	4.09	N
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	9.24	9.0	A		2.7	6.3 - 11.7	0.55	A
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	0.026	0.0096	N	(4)		Sensitivity Evaluation	0.005	
Plutonium-239/240	0.528	0.528	A		0.0	0.370 - 0.686	0.037	A
Potassium-40	NR			(6)		False Positive Test		
Radium-226	NR	0.226				0.158 - 0.294		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	3.71	3.86	A		-3.9	2.70 - 5.02	0.110	A
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	0.013	0.0215	N	(4)		Sensitivity Evaluation	0.002	
Uranium-238	0.02	0.0123	A			Sensitivity Evaluation	0.003	
Zinc-65	0.53		A			False Positive Test	0.546	

Radiological Reference Date: August 1, 2021

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



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

Laboratory Results For MAPEP-21-MaW45  
 (ANTE01) ALS Environmental - Fort Collins, CO  
 225 Commerce Drive  
 Fort Collins, CO 80524-1416

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	6.71	7.27	A		-7.7	5.09 - 9.45	0.235316	A
Arsenic	2.12	2.46	A		-13.8	1.72 - 3.20	0.074897	A
Barium	2.99	3.18	A		-6.0	2.23 - 4.13	0.103007	A
Beryllium	3.65	4.03	A		-9.4	2.82 - 5.24	0.193085	A
Cadmium	0.408	0.468	A		-12.8	0.328 - 0.608	0.013496	A
Chromium	2.41	2.48	A		-2.8	1.74 - 3.22	0.189524	A
Cobalt	5.7	6.04	A		-5.6	4.23 - 7.85	0.825744	A
Copper	8.04	8.29	A		-3.0	5.80 - 10.78	0.809715	A
Lead	2.74	3.00	A		-8.7	2.10 - 3.90	0.082795	A
Mercury	0.14	0.128	A		9.4	0.090 - 0.166	0.009436	A
Nickel	0.02	0.00102	A	(17)		Sensitivity Evaluation	0.02	
Selenium	.0354	0.411	N		-91.4	0.288 - 0.534	0.014850	N
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	2.73	3.06	A		-10.8	2.14 - 3.98	0.096578	A
Uranium-235	0.0001	7.0E-6	A	(17)		Sensitivity Evaluation	0.0001	
Uranium-238	0.00083	9.9E-4	A		-16.2	6.93E-4 - 1.29E-3	0.0004	N
Uranium-Total	0.00084	1.00E-3	A		-16.0	0.00070 - 0.00130	0.0004	N
Vanadium	9.18	10.1	A		-9.1	7.1 - 13.1	0.268018	A
Zinc	7.75	8.42	A		-8.0	5.89 - 10.95	0.695060	A

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.362	0.426	A		-15.0	0.298 - 0.554	0.032	A
Cesium-134	9.13	10.4	A		-12.2	7.3 - 13.5	0.54	A
Cesium-137	0.192		A			False Positive Test	0.192	
Cobalt-57	12.6	13.9	A		-9.4	9.7 - 18.1	0.7	A
Cobalt-60	13.3	14.0	A		-5.0	9.8 - 18.2	0.8	A
Hydrogen-3	248	250	A		-0.8	175 - 325	20	A
Iron-55	NR	49.8	N	(28)		34.9 - 64.7		
Manganese-54	8.20	9.0	A		-8.9	6.3 - 11.7	0.50	A
Nickel-63	43.4	39.5	A		9.9	27.7 - 51.4	5.4	A
Plutonium-238	0.006	0.0096	A	(17)		Sensitivity Evaluation	0.006	
Plutonium-239/240	0.468	0.528	A		-11.4	0.370 - 0.686	0.042	A
Potassium-40	3.90		A			False Positive Test	3.90	
Radium-226	0.210	0.226	A		-7.1	0.158 - 0.294	0.033	W

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	3.59	3.86	A		-7.0	2.70 - 5.02	0.43	A
Technetium-99	3.17	3.71	A		-14.6	2.60 - 4.82	0.43	A
Uranium-234	0.035	0.0215	A			Sensitivity Evaluation	0.005	
Uranium-238	0.013	0.0123	A			Sensitivity Evaluation	0.003	
Zinc-65	0.455		A			False Positive Test	0.455	

Radiological Reference Date: August 1, 2021

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





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

Laboratory Results For MAPEP-21-MaW45

(AREV01) Framatome - CMC

1724 Mount Athos Road

Lynchburg, VA 24504

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	1.42	7.27	N		-80.5	5.09 - 9.45	.14	A
Arsenic	2.28	2.46	A		-7.3	1.72 - 3.20	0.23	A
Barium	2.98	3.18	A		-6.3	2.23 - 4.13	0.3	A
Beryllium	3.93	4.03	A		-2.5	2.82 - 5.24	.39	A
Cadmium	0.46	0.468	A		-1.7	0.328 - 0.608	.05	A
Chromium	2.48	2.48	A		0.0	1.74 - 3.22	0.25	A
Cobalt	6.23	6.04	A		3.1	4.23 - 7.85	0.62	A
Copper	8.14	8.29	A		-1.8	5.80 - 10.78	0.81	A
Lead	2.94	3.00	A		-2.0	2.10 - 3.90	.29	A
Mercury	0.13	0.128	A		1.6	0.090 - 0.166	0.01	A
Nickel	0.05	0.00102	A	(17)		Sensitivity Evaluation	0.05	
Selenium	0.84	0.411	N		104.4	0.288 - 0.534	0.08	A
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	2.91	3.06	A		-4.9	2.14 - 3.98	0.29	A
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	8.34	8.42	A		-1.0	5.89 - 10.95	0.83	A

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.426				0.298 - 0.554		
Cesium-134	NR	10.4				7.3 - 13.5		
Cesium-137	NR					False Positive Test		
Cobalt-57	NR	13.9				9.7 - 18.1		
Cobalt-60	NR	14.0				9.8 - 18.2		
Hydrogen-3	312	250	W		24.8	175 - 325	30	A
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	NR	9.0				6.3 - 11.7		
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	NR	0.0096				Sensitivity Evaluation		
Plutonium-239/240	NR	0.528				0.370 - 0.686		
Potassium-40	NR					False Positive Test		
Radium-226	NR	0.226				0.158 - 0.294		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	3.86				2.70 - 5.02		
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	NR	0.0215				Sensitivity Evaluation		
Uranium-238	NR	0.0123				Sensitivity Evaluation		
Zinc-65	NR					False Positive Test		

Radiological Reference Date: August 1, 2021

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



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

## Laboratory Results For MAPEP-21-MaW45

(ARGO01) Idaho National Laboratory

INL, Materials and Fuels Complex

Idaho Falls, ID 83415

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	7.20	7.27	A		-1.0	5.09 - 9.45	0.36	A
Arsenic	2.37	2.46	A		-3.7	1.72 - 3.20	0.24	A
Barium	3.16	3.18	A		-0.6	2.23 - 4.13	0.16	A
Beryllium	3.95	4.03	A		-2.0	2.82 - 5.24	0.20	A
Cadmium	0.480	0.468	A		2.6	0.328 - 0.608	0.024	A
Chromium	2.48	2.48	A		0.0	1.74 - 3.22	0.13	A
Cobalt	6.02	6.04	A		-0.3	4.23 - 7.85	0.30	A
Copper	8.13	8.29	A		-1.9	5.80 - 10.78	0.41	A
Lead	2.93	3.00	A		-2.3	2.10 - 3.90	0.15	A
Mercury	0.12	0.128	A		-6.3	0.090 - 0.166	0.01	A
Nickel	0.000104	0.00102	N	(4)		Sensitivity Evaluation	0.000013	
Selenium	0.450	0.411	A		9.5	0.288 - 0.534	0.045	A
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	2.95	3.06	A		-3.6	2.14 - 3.98	0.15	A
Uranium-235	0.0000070	7.0E-6	A			Sensitivity Evaluation	0.000000	
Uranium-238	0.000992	9.9E-4	A		0.2	6.93E-4 - 1.29E-3	0.000050	A
Uranium-Total	0.000999	1.00E-3	A		-0.1	0.00070 - 0.00130	0.000050	A
Vanadium	10.0	10.1	A		-1.0	7.1 - 13.1	0.5	A
Zinc	8.96	8.42	A		6.4	5.89 - 10.95	1.08	A

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.426				0.298 - 0.554		
Cesium-134	9.4	10.4	A		-9.6	7.3 - 13.5	0.3	A
Cesium-137	0.49		A			False Positive Test	0.49	
Cobalt-57	13.2	13.9	A		-5.0	9.7 - 18.1	0.5	A
Cobalt-60	14.0	14.0	A		0.0	9.8 - 18.2	0.5	A
Hydrogen-3	NR	250	N	(28)		175 - 325		
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	9.6	9.0	A		6.7	6.3 - 11.7	0.6	A
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	0.12	0.0096	N	(4)		Sensitivity Evaluation	0.02	
Plutonium-239/240	0.53	0.528	A		0.4	0.370 - 0.686	0.07	A
Potassium-40	5.13		A			False Positive Test	5.13	
Radium-226	NR	0.226				0.158 - 0.294		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	3.36	3.86	A		-13.0	2.70 - 5.02	0.42	A
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	0.17	0.0215	A	(17)		Sensitivity Evaluation	0.17	
Uranium-238	0.053	0.0123	A	(17)		Sensitivity Evaluation	0.053	
Zinc-65	1.09		A			False Positive Test	1.09	

Radiological Reference Date: August 1, 2021

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



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

*Laboratory Results For MAPEP-21-MaW45*

(ARPL01) Analytical Support Operations - Radiochemical Processing Lab

PO Box 999

Richland, WA 99354

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.427	0.426	A		0.2	0.298 - 0.554	0.018	A
Cesium-134	10.1	10.4	A		-2.9	7.3 - 13.5	0.22	A
Cesium-137	0.16		A			False Positive Test	0.57	
Cobalt-57	13.3	13.9	A		-4.3	9.7 - 18.1	0.74	A
Cobalt-60	14.1	14.0	A		0.7	9.8 - 18.2	0.31	A
Hydrogen-3	228	250	A		-8.8	175 - 325	21	A
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	9.15	9.0	A		1.7	6.3 - 11.7	0.22	A
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	0.013	0.0096	A			Sensitivity Evaluation	0.003	
Plutonium-239/240	0.481	0.528	A		-8.9	0.370 - 0.686	0.024	A
Potassium-40	-0.30		A			False Positive Test	3.3	
Radium-226	NR	0.226				0.158 - 0.294		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	3.52	3.86	A		-8.8	2.70 - 5.02	0.15	A
Technetium-99	3.12	3.71	A		-15.9	2.60 - 4.82	0.26	A
Uranium-234	0.031	0.0215	A			Sensitivity Evaluation	0.005	
Uranium-238	0.017	0.0123	A			Sensitivity Evaluation	0.003	
Zinc-65	-0.09		A			False Positive Test	0.39	

Radiological Reference Date: August 1, 2021

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



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

*Laboratory Results For MAPEP-21-MaW45*

(ARSL01) ARS Aleut Analytical, LLC

2609 North River Road

Port Allen, LA 70767

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	6.47	7.27	A		-11.0	5.09 - 9.45	0.213	A
Arsenic	2.05	2.46	A		-16.7	1.72 - 3.20	0.219	A
Barium	2.87	3.18	A		-9.7	2.23 - 4.13	0.147	A
Beryllium	3.75	4.03	A		-6.9	2.82 - 5.24	0.0215	N
Cadmium	0.405	0.468	A		-13.5	0.328 - 0.608	0.384	N
Chromium	2.27	2.48	A		-8.5	1.74 - 3.22	0.261	A
Cobalt	5.34	6.04	A		-11.6	4.23 - 7.85	0.257	A
Copper	7.29	8.29	A		-12.1	5.80 - 10.78	0.595	A
Lead	2.83	3.00	A		-5.7	2.10 - 3.90	0.0613	A
Mercury	0.135	0.128	A		5.5	0.090 - 0.166	0.0168	A
Nickel	0.0017	0.00102	A	(17)		Sensitivity Evaluation	0.200	
Selenium	0.352	0.411	A		-14.4	0.288 - 0.534	0.253	N
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	2.88	3.06	A		-5.9	2.14 - 3.98	0.058	A
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	0.0009	1.00E-3	A		-10.0	0.00070 - 0.00130	0.006	N
Vanadium	8.93	10.1	A		-11.6	7.1 - 13.1	0.642	A
Zinc	7.55	8.42	A		-10.3	5.89 - 10.95	0.757	A

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.426				0.298 - 0.554		
Cesium-134	8.671	10.4	A		-16.6	7.3 - 13.5	0.292	A
Cesium-137	0.088		A			False Positive Test	0.079	
Cobalt-57	13.352	13.9	A		-3.9	9.7 - 18.1	0.465	A
Cobalt-60	13.94	14.0	A		-0.4	9.8 - 18.2	0.287	A
Hydrogen-3	264.765	250	A		5.9	175 - 325	14.907	A
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	9.049	9.0	A		0.5	6.3 - 11.7	0.314	A
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	NR	0.0096				Sensitivity Evaluation		
Plutonium-239/240	NR	0.528				0.370 - 0.686		
Potassium-40	-0.961		A			False Positive Test	0.858	
Radium-226	0.155	0.226	N		-31.4	0.158 - 0.294	0.016	A

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	4.069	3.86	A		5.4	2.70 - 5.02	0.343	A
Technetium-99	2.180	3.71	N		-41.2	2.60 - 4.82	0.338	W
Uranium-234	NR	0.0215				Sensitivity Evaluation		
Uranium-238	NR	0.0123				Sensitivity Evaluation		
Zinc-65	-0.146		A			False Positive Test	0.172	

Radiological Reference Date: August 1, 2021

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





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

*Laboratory Results For MAPEP-21-MaW45*

(ASUK99) AWE (Aldermaston)

A38.1 AWE,

Reading, Berkshire RG7 4PR

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.426				0.298 - 0.554		
Cesium-134	NR	10.4				7.3 - 13.5		
Cesium-137	NR					False Positive Test		
Cobalt-57	NR	13.9				9.7 - 18.1		
Cobalt-60	NR	14.0				9.8 - 18.2		
Hydrogen-3	NR	250				175 - 325		
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	NR	9.0				6.3 - 11.7		
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	0.0062	0.0096	A			Sensitivity Evaluation	0.0014	
Plutonium-239/240	0.460	0.528	A		-12.9	0.370 - 0.686	0.011	A
Potassium-40	NR					False Positive Test		
Radium-226	NR	0.226				0.158 - 0.294		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	3.86				2.70 - 5.02		
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	0.022	0.0215	A			Sensitivity Evaluation	0.002	
Uranium-238	0.010	0.0123	A			Sensitivity Evaluation	0.0017	
Zinc-65	NR					False Positive Test		

Radiological Reference Date: August 1, 2021

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



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

*Laboratory Results For MAPEP-21-MaW45*

(AY1201) Consolidated Nuclear Security, LLC, ACO Laboratory

Y12, NSC, Bldg. 9995, Rm 142

Oak Ridge, TN 37831-8189

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	7.29	7.27	A		0.3	5.09 - 9.45	0.385	A
Arsenic	2.38	2.46	A		-3.3	1.72 - 3.20	0.134	A
Barium	3.18	3.18	A		0.0	2.23 - 4.13	0.129	A
Beryllium	4.05	4.03	A		0.5	2.82 - 5.24	0.252	A
Cadmium	0.478	0.468	A		2.1	0.328 - 0.608	0.029	A
Chromium	2.53	2.48	A		2.0	1.74 - 3.22	0.080	A
Cobalt	6.03	6.04	A		-0.2	4.23 - 7.85	0.302	A
Copper	8.43	8.29	A		1.7	5.80 - 10.78	0.347	A
Lead	3.06	3.00	A		2.0	2.10 - 3.90	0.200	A
Mercury	0.139	0.128	A		8.6	0.090 - 0.166	0.0106	A
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	0.413	0.411	A		0.5	0.288 - 0.534	0.0670	W
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	3.06	3.06	A		0.0	2.14 - 3.98	0.209	A
Uranium-235	0.0000019	7.0E-6	A	(17)		Sensitivity Evaluation	0.0001	
Uranium-238	0.001	9.9E-4	A		1.0	6.93E-4 - 1.29E-3	0.0001	A
Uranium-Total	0.001	1.00E-3	A		0.0	0.00070 - 0.00130	0.0001	A
Vanadium	10.2	10.1	A		1.0	7.1 - 13.1	0.388	A
Zinc	8.20	8.42	A		-2.6	5.89 - 10.95	0.513	A

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.407	0.426	A		-4.5	0.298 - 0.554	0.074	W
Cesium-134	NR	10.4		(6)		7.3 - 13.5		
Cesium-137	0.00560		A			False Positive Test	0.19	
Cobalt-57	14.2	13.9	A		2.2	9.7 - 18.1	1.8	A
Cobalt-60	14.6	14.0	A		4.3	9.8 - 18.2	1.4	A
Hydrogen-3	225	250	A		-10.0	175 - 325	19	A
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	9.27	9.0	A		3.0	6.3 - 11.7	1.1	A
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	0.00574	0.0096	A	(17)		Sensitivity Evaluation	0.011	
Plutonium-239/240	0.448	0.528	A		-15.2	0.370 - 0.686	0.072	W
Potassium-40	NR			(6)		False Positive Test		
Radium-226	0.182	0.226	A		-19.5	0.158 - 0.294	0.12	N

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	4.22	3.86	A		9.3	2.70 - 5.02	0.29	A
Technetium-99	5.07	3.71	N		36.7	2.60 - 4.82	0.96	W
Uranium-234	0.0267	0.0215	A	(17)		Sensitivity Evaluation	0.012	
Uranium-238	0.0125	0.0123	A	(17)		Sensitivity Evaluation	0.0083	
Zinc-65	0.0987		A			False Positive Test	0.53	

Radiological Reference Date: August 1, 2021

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



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

## Laboratory Results For MAPEP-21-MaW45

(BY1201) Consolidated Nuclear Security, LLC, ACO, Production Laboratory

Y12, NSC, Bldg. 9995, Rm 142

Oak Ridge, TN 37831-8189

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.72	0.426	N		69.0	0.298 - 0.554	0.56	N
Cesium-134	NR	10.4		(6)		7.3 - 13.5		
Cesium-137	-0.05		A			False Positive Test	0.103	
Cobalt-57	14.13	13.9	A		1.7	9.7 - 18.1	0.228	N
Cobalt-60	13.68	14.0	A		-2.3	9.8 - 18.2	0.243	N
Hydrogen-3	NR	250				175 - 325		
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	9.23	9.0	A		2.6	6.3 - 11.7	0.275	A
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	0.005	0.0096	A	(17)		Sensitivity Evaluation	0.007	
Plutonium-239/240	0.488	0.528	A		-7.6	0.370 - 0.686	0.037	A
Potassium-40	-0.03		A			False Positive Test	0.98	
Radium-226	NR	0.226				0.158 - 0.294		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	3.54	3.86	A		-8.3	2.70 - 5.02	0.419	A
Technetium-99	4.11	3.71	A		10.8	2.60 - 4.82	0.216	A
Uranium-234	0.0592	0.0215	A			Sensitivity Evaluation	0.018	
Uranium-238	0.0144	0.0123	A	(17)		Sensitivity Evaluation	0.008	
Zinc-65	0.09		A			False Positive Test	0.207	

Radiological Reference Date: August 1, 2021

**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

(2) = False Negative

(4) = Sensitivity Evaluation

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(17) = NOT DETECTED - reported a statistically zero result

(28) = Not Reporting Previously Reported Analyte



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

*Laboratory Results For MAPEP-21-MaW45*

(CESL01) Lawrence Livermore National Laboratory - EMRL

7000 East Avenue

Livermore, CA 94551

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.426				0.298 - 0.554		
Cesium-134	8.47E+00	10.4	A		-18.6	7.3 - 13.5	1.33	W
Cesium-137	-4.42E-01			A		False Positive Test	3.74	
Cobalt-57	1.35E+01	13.9	A		-2.9	9.7 - 18.1	1.41	A
Cobalt-60	1.42E+01	14.0	A		1.4	9.8 - 18.2	2.08	A
Hydrogen-3	2.40E+02	250	A		-4.0	175 - 325	3.88	N
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	8.25E+00	9.0	A		-8.3	6.3 - 11.7	2.48	N
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	4.54E-03	0.0096	A	(17)		Sensitivity Evaluation	5.28E-03	
Plutonium-239/240	4.60E-01	0.528	A		-12.9	0.370 - 0.686	1.32E-02	A
Potassium-40	5.19E+00			A		False Positive Test	4.43	
Radium-226	NR	0.226				0.158 - 0.294		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	3.86				2.70 - 5.02		
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	NR	0.0215				Sensitivity Evaluation		
Uranium-238	NR	0.0123				Sensitivity Evaluation		
Zinc-65	2.35E+00		A			False Positive Test	1.02	

Radiological Reference Date: August 1, 2021

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





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

*Laboratory Results For MAPEP-21-MaW45*

(DEHS01) Department of Environmental Health & Safety

North Carolina State Univ.

Raleigh, NC 27695-8007

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.426				0.298 - 0.554		
Cesium-134	10.24	10.4	A		-1.5	7.3 - 13.5	0.62	A
Cesium-137	0.83			A		False Positive Test	1.0	
Cobalt-57	13.66	13.9	A		-1.7	9.7 - 18.1	0.39	A
Cobalt-60	14.11	14.0	A		0.8	9.8 - 18.2	0.48	A
Hydrogen-3	NR	250				175 - 325		
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	9.71	9.0	A		7.9	6.3 - 11.7	0.67	A
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	NR	0.0096				Sensitivity Evaluation		
Plutonium-239/240	NR	0.528				0.370 - 0.686		
Potassium-40	14			A		False Positive Test	19	
Radium-226	NR	0.226				0.158 - 0.294		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	3.86				2.70 - 5.02		
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	NR	0.0215				Sensitivity Evaluation		
Uranium-238	NR	0.0123				Sensitivity Evaluation		
Zinc-65	0.50		A			False Positive Test	1.0	

Radiological Reference Date: August 1, 2021

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



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

Laboratory Results For MAPEP-21-MaW45  
 (EFGS01) Eurofins Frontier Global Sciences, LLC.  
 5755 8th St. E  
 Tacoma, WA 98424

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag	
Antimony	NR	7.27			5.09 - 9.45			
Arsenic	NR	2.46			1.72 - 3.20			
Barium	NR	3.18			2.23 - 4.13			
Beryllium	NR	4.03			2.82 - 5.24			
Cadmium	NR	0.468			0.328 - 0.608			
Chromium	NR	2.48			1.74 - 3.22			
Cobalt	NR	6.04			4.23 - 7.85			
Copper	NR	8.29			5.80 - 10.78			
Lead	NR	3.00			2.10 - 3.90			
Mercury	0.121	0.128	A	-5.5	0.090 - 0.166	0.005	A	
Nickel	NR	0.00102			Sensitivity Evaluation			
Selenium	NR	0.411			0.288 - 0.534			
Technetium-99	NR	5.87E-6			4.11E-6 - 7.63E-6			
Thallium	NR	3.06			2.14 - 3.98			
Uranium-235	NR	7.0E-6			Sensitivity Evaluation			
Uranium-238	NR	9.9E-4			6.93E-4 - 1.29E-3			
Uranium-Total	NR	1.00E-3			0.00070 - 0.00130			
Vanadium	NR	10.1			7.1 - 13.1			
Zinc	NR	8.42			5.89 - 10.95			

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag	
Americium-241	NR	0.426			0.298 - 0.554			
Cesium-134	NR	10.4			7.3 - 13.5			
Cesium-137	NR				False Positive Test			
Cobalt-57	NR	13.9			9.7 - 18.1			
Cobalt-60	NR	14.0			9.8 - 18.2			
Hydrogen-3	NR	250			175 - 325			
Iron-55	NR	49.8			34.9 - 64.7			
Manganese-54	NR	9.0			6.3 - 11.7			
Nickel-63	NR	39.5			27.7 - 51.4			
Plutonium-238	NR	0.0096			Sensitivity Evaluation			
Plutonium-239/240	NR	0.528			0.370 - 0.686			
Potassium-40	NR				False Positive Test			
Radium-226	NR	0.226			0.158 - 0.294			

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	3.86				2.70 - 5.02		
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	NR	0.0215				Sensitivity Evaluation		
Uranium-238	NR	0.0123				Sensitivity Evaluation		
Zinc-65	NR					False Positive Test		

Radiological Reference Date: August 1, 2021

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



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

## Laboratory Results For MAPEP-21-MaW45

(ELIW01) Energy Laboratories, Inc.

2393 Salt Creek HWY

Casper, Wy 82601

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.426				0.298 - 0.554		
Cesium-134	NR	10.4				7.3 - 13.5		
Cesium-137	NR					False Positive Test		
Cobalt-57	NR	13.9				9.7 - 18.1		
Cobalt-60	NR	14.0				9.8 - 18.2		
Hydrogen-3	NR	250				175 - 325		
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	NR	9.0				6.3 - 11.7		
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	NR	0.0096				Sensitivity Evaluation		
Plutonium-239/240	NR	0.528				0.370 - 0.686		
Potassium-40	NR					False Positive Test		
Radium-226	0.1	0.226	N		-55.8	0.158 - 0.294	0.015	A

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	3.86				2.70 - 5.02		
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	0.05	0.0215	N	(4)		Sensitivity Evaluation	0.005	
Uranium-238	0.02	0.0123	A	(17)		Sensitivity Evaluation	0.01	
Zinc-65	NR					False Positive Test		

Radiological Reference Date: August 1, 2021

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



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

*Laboratory Results For MAPEP-21-MaW45*

(ERAD01) Lawrence Livermore National Laboratory ERAD

7000 East Ave., L-231

Livermore, CA 94551

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	0.0000063	7.0E-6	A			Sensitivity Evaluation	0.000000	
Uranium-238	0.000871	9.9E-4	A		-12.0	6.93E-4 - 1.29E-3	0.000011	N
Uranium-Total	0.000877	1.00E-3	A		-12.3	0.00070 - 0.00130	0.000013	N
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.426				0.298 - 0.554		
Cesium-134	NR	10.4				7.3 - 13.5		
Cesium-137	NR					False Positive Test		
Cobalt-57	NR	13.9				9.7 - 18.1		
Cobalt-60	NR	14.0				9.8 - 18.2		
Hydrogen-3	NR	250				175 - 325		
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	NR	9.0				6.3 - 11.7		
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	NR	0.0096				Sensitivity Evaluation		
Plutonium-239/240	NR	0.528				0.370 - 0.686		
Potassium-40	NR					False Positive Test		
Radium-226	NR	0.226				0.158 - 0.294		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	3.86				2.70 - 5.02		
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	NR	0.0215				Sensitivity Evaluation		
Uranium-238	NR	0.0123				Sensitivity Evaluation		
Zinc-65	NR					False Positive Test		

Radiological Reference Date: August 1, 2021

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





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

Laboratory Results For MAPEP-21-MaW45  
 (ERCL01) Washington State Public Health Laboratories  
 1610 N.E. 150th Street  
 Shoreline, WA 98155-9701

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	7.08	7.27	A		-2.6	5.09 - 9.45	0.36	A
Arsenic	2.34	2.46	A		-4.9	1.72 - 3.20	0.12	A
Barium	3.07	3.18	A		-3.5	2.23 - 4.13	0.16	A
Beryllium	4.52	4.03	A		12.2	2.82 - 5.24	0.23	A
Cadmium	0.464	0.468	A		-0.9	0.328 - 0.608	0.024	A
Chromium	2.73	2.48	A		10.1	1.74 - 3.22	0.14	A
Cobalt	6.02	6.04	A		-0.3	4.23 - 7.85	0.31	A
Copper	8.15	8.29	A		-1.7	5.80 - 10.78	0.42	A
Lead	3.08	3.00	A		2.7	2.10 - 3.90	0.16	A
Mercury	NR	0.128				0.090 - 0.166		
Nickel	0.0013	0.00102	A	(17)		Sensitivity Evaluation	0.0013	
Selenium	0.408	0.411	A		-0.7	0.288 - 0.534	0.021	A
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	3.09	3.06	A		1.0	2.14 - 3.98	0.16	A
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	0.0022	9.9E-4	N		122.2	6.93E-4 - 1.29E-3	0.0015	N
Uranium-Total	0.0023	1.00E-3	N		130.0	0.00070 - 0.00130	0.0015	N
Vanadium	11.2	10.1	A		10.9	7.1 - 13.1	0.6	A
Zinc	8.44	8.42	A		0.2	5.89 - 10.95	0.43	A

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.396	0.426	A		-7.0	0.298 - 0.554	0.021	A
Cesium-134	11.4	10.4	A		9.6	7.3 - 13.5	0.2	N
Cesium-137	0.074		A			False Positive Test	0.089	
Cobalt-57	14.0	13.9	A		0.7	9.7 - 18.1	0.2	N
Cobalt-60	14.3	14.0	A		2.1	9.8 - 18.2	0.2	N
Hydrogen-3	265	250	A		6.0	175 - 325	8	A
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	8.95	9.0	A		-0.6	6.3 - 11.7	0.21	A
Nickel-63	36.3	39.5	A		-8.1	27.7 - 51.4	5.3	A
Plutonium-238	0.0078	0.0096	A	(17)		Sensitivity Evaluation	0.0036	
Plutonium-239/240	0.507	0.528	A		-4.0	0.370 - 0.686	0.026	A
Potassium-40	1.8		A			False Positive Test	1.4	
Radium-226	0.292	0.226	W		29.2	0.158 - 0.294	0.047	W

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	3.48	3.86	A		-9.8	2.70 - 5.02	0.23	A
Technetium-99	3.44	3.71	A		-7.3	2.60 - 4.82	0.57	W
Uranium-234	0.022	0.0215	A	(17)		Sensitivity Evaluation	0.011	
Uranium-238	0.0144	0.0123	A	(17)		Sensitivity Evaluation	0.0074	
Zinc-65	-0.07		A			False Positive Test	0.21	

Radiological Reference Date: August 1, 2021

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



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

*Laboratory Results For MAPEP-21-MaW45*

(ERHD99) National Monitoring Section, Radiation Protection Bureau, Health Canada

775 Brookfield Road AL6302D1

Ottawa, Ontario K1A 1C1

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	7.377	7.27	A		1.5	5.09 - 9.45	0.0006	N
Arsenic	2.315	2.46	A		-5.9	1.72 - 3.20	0.0008	N
Barium	3.192	3.18	A		0.4	2.23 - 4.13	0.00074	N
Beryllium	3.922	4.03	A		-2.7	2.82 - 5.24	0.00032	N
Cadmium	0.476	0.468	A		1.7	0.328 - 0.608	0.00079	N
Chromium	2.470	2.48	A		-0.4	1.74 - 3.22	0.00079	N
Cobalt	6.040	6.04	A		0.0	4.23 - 7.85	0.00076	N
Copper	NR	8.29				5.80 - 10.78		
Lead	3.125	3.00	A		4.2	2.10 - 3.90	0.0012	N
Mercury	NR	0.128				0.090 - 0.166		
Nickel	0.0001	0.00102	A	(17)		Sensitivity Evaluation	0.005	
Selenium	0.377	0.411	A		-8.3	0.288 - 0.534	0.002	N
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	3.117	3.06	A		1.9	2.14 - 3.98	0.0012	N
Uranium-235	0.000007	7.0E-6	A	(17)		Sensitivity Evaluation	0.000003	
Uranium-238	0.00092	9.9E-4	A		-7.1	6.93E-4 - 1.29E-3	0.00001	N
Uranium-Total	0.00092	1.00E-3	A		-8.0	0.00070 - 0.00130	0.00001	N
Vanadium	9.953	10.1	A		-1.5	7.1 - 13.1	0.00058	N
Zinc	8.273	8.42	A		-1.7	5.89 - 10.95	0.001	N

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.469	0.426	A		10.1	0.298 - 0.554	0.017	A
Cesium-134	10.59	10.4	A		1.8	7.3 - 13.5	0.40	A
Cesium-137	0.11		A			False Positive Test	0.12	
Cobalt-57	13.43	13.9	A		-3.4	9.7 - 18.1	0.50	A
Cobalt-60	13.65	14.0	A		-2.5	9.8 - 18.2	0.55	A
Hydrogen-3	259.6	250	A		3.8	175 - 325	4.4	N
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	8.37	9.0	A		-7.0	6.3 - 11.7	0.3	A
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	0.004	0.0096	A	(17)		Sensitivity Evaluation	0.002	
Plutonium-239/240	0.493	0.528	A		-6.6	0.370 - 0.686	0.017	A
Potassium-40	-0.3195		A			False Positive Test	0.60	
Radium-226	0.250	0.226	A		10.6	0.158 - 0.294	0.012	A

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	3.66	3.86	A		-5.2	2.70 - 5.02	0.10	A
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	0.013	0.0215	A			Sensitivity Evaluation	0.003	
Uranium-238	0.012	0.0123	A			Sensitivity Evaluation	0.003	
Zinc-65	0.098		A			False Positive Test	0.13	

Radiological Reference Date: August 1, 2021

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



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

*Laboratory Results For MAPEP-21-MaW45*

(ESDE01) Region 5 EQC Tritium Lab

206 Beaufort NE

Aiken, SC 29801

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag	
Antimony	NR	7.27			5.09 - 9.45			
Arsenic	NR	2.46			1.72 - 3.20			
Barium	NR	3.18			2.23 - 4.13			
Beryllium	NR	4.03			2.82 - 5.24			
Cadmium	NR	0.468			0.328 - 0.608			
Chromium	NR	2.48			1.74 - 3.22			
Cobalt	NR	6.04			4.23 - 7.85			
Copper	NR	8.29			5.80 - 10.78			
Lead	NR	3.00			2.10 - 3.90			
Mercury	NR	0.128			0.090 - 0.166			
Nickel	NR	0.00102			Sensitivity Evaluation			
Selenium	NR	0.411			0.288 - 0.534			
Technetium-99	NR	5.87E-6			4.11E-6 - 7.63E-6			
Thallium	NR	3.06			2.14 - 3.98			
Uranium-235	NR	7.0E-6			Sensitivity Evaluation			
Uranium-238	NR	9.9E-4			6.93E-4 - 1.29E-3			
Uranium-Total	NR	1.00E-3			0.00070 - 0.00130			
Vanadium	NR	10.1			7.1 - 13.1			
Zinc	NR	8.42			5.89 - 10.95			

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag	
Americium-241	NR	0.426			0.298 - 0.554			
Cesium-134	NR	10.4			7.3 - 13.5			
Cesium-137	NR				False Positive Test			
Cobalt-57	NR	13.9			9.7 - 18.1			
Cobalt-60	NR	14.0			9.8 - 18.2			
Hydrogen-3	254.4	250	A	1.8	175 - 325	8.4	A	
Iron-55	NR	49.8			34.9 - 64.7			
Manganese-54	NR	9.0			6.3 - 11.7			
Nickel-63	NR	39.5			27.7 - 51.4			
Plutonium-238	NR	0.0096			Sensitivity Evaluation			
Plutonium-239/240	NR	0.528			0.370 - 0.686			
Potassium-40	NR				False Positive Test			
Radium-226	NR	0.226			0.158 - 0.294			

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	3.86				2.70 - 5.02		
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	NR	0.0215				Sensitivity Evaluation		
Uranium-238	NR	0.0123				Sensitivity Evaluation		
Zinc-65	NR					False Positive Test		

Radiological Reference Date: August 1, 2021

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



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

Laboratory Results For MAPEP-21-MaW45

(ETTP01) MCLinc

161 Mitchell Road

Oak Ridge, Tennessee 37830

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	7.356	7.27	A		1.2	5.09 - 9.45	0.37	A
Arsenic	2.297	2.46	A		-6.6	1.72 - 3.20	0.113	A
Barium	2.982	3.18	A		-6.2	2.23 - 4.13	0.078	A
Beryllium	3.779	4.03	A		-6.2	2.82 - 5.24	0.268	A
Cadmium	0.443	0.468	A		-5.3	0.328 - 0.608	0.011	A
Chromium	2.498	2.48	A		0.7	1.74 - 3.22	0.252	A
Cobalt	5.763	6.04	A		-4.6	4.23 - 7.85	0.48	A
Copper	7.215	8.29	A		-13.0	5.80 - 10.78	0.57	A
Lead	2.907	3.00	A		-3.1	2.10 - 3.90	0.198	A
Mercury	0.1331	0.128	A		4.0	0.090 - 0.166	0.0066	A
Nickel	0.021	0.00102	N	(4)		Sensitivity Evaluation	0.0004	
Selenium	0.386	0.411	A		-6.1	0.288 - 0.534	0.050	A
Technetium-99	0.0000063	5.87E-6	A		8.2	4.11E-6 - 7.63E-6	0.000000	A
Thallium	3.003	3.06	A		-1.9	2.14 - 3.98	0.342	A
Uranium-235	0.000062	7.0E-6	A	(17)		Sensitivity Evaluation	0.00019	
Uranium-238	0.0044	9.9E-4		(6)	344.4	6.93E-4 - 1.29E-3	0.075	N
Uranium-Total	0.0044	1.00E-3		(6)	340.0	0.00070 - 0.00130	0.075	N
Vanadium	9.49	10.1	A		-6.0	7.1 - 13.1	0.55	A
Zinc	7.832	8.42	A		-7.0	5.89 - 10.95	0.384	A

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.426				0.298 - 0.554		
Cesium-134	NR	10.4				7.3 - 13.5		
Cesium-137	NR					False Positive Test		
Cobalt-57	NR	13.9				9.7 - 18.1		
Cobalt-60	NR	14.0				9.8 - 18.2		
Hydrogen-3	NR	250				175 - 325		
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	NR	9.0				6.3 - 11.7		
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	NR	0.0096				Sensitivity Evaluation		
Plutonium-239/240	NR	0.528				0.370 - 0.686		
Potassium-40	NR					False Positive Test		
Radium-226	NR	0.226				0.158 - 0.294		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	3.86				2.70 - 5.02		
Technetium-99	NR	3.71	N	(28)		2.60 - 4.82		
Uranium-234	NR	0.0215				Sensitivity Evaluation		
Uranium-238	NR	0.0123				Sensitivity Evaluation		
Zinc-65	NR					False Positive Test		

Radiological Reference Date: August 1, 2021

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





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

*Laboratory Results For MAPEP-21-MaW45*

(EULC01) EnergySolutions, LLC

I-80, Exit 49

Clive, UT 84029

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	.499	0.426	A		17.1	0.298 - 0.554	.186	N
Cesium-134	8.791	10.4	A		-15.5	7.3 - 13.5	.533	A
Cesium-137	.021		A			False Positive Test	.019	
Cobalt-57	11.981	13.9	A		-13.8	9.7 - 18.1	1.758	A
Cobalt-60	12.055	14.0	A		-13.9	9.8 - 18.2	.726	A
Hydrogen-3	NR	250				175 - 325		
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	8.295	9.0	A		-7.8	6.3 - 11.7	.893	A
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	NR	0.0096				Sensitivity Evaluation		
Plutonium-239/240	NR	0.528				0.370 - 0.686		
Potassium-40	1.914		A			False Positive Test	1.2	
Radium-226	NR	0.226				0.158 - 0.294		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	3.86				2.70 - 5.02		
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	NR	0.0215				Sensitivity Evaluation		
Uranium-238	NR	0.0123				Sensitivity Evaluation		
Zinc-65	.345		A			False Positive Test	.21	

Radiological Reference Date: August 1, 2021

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



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

*Laboratory Results For MAPEP-21-MaW45*

(FDHE01) Florida Dept of Health Environmental Laboratory

PO Box 680069

Orlando, FL 32868-0069

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.463	0.426	A		8.7	0.298 - 0.554	0.354	N
Cesium-134	9.349	10.4	A		-10.1	7.3 - 13.5	0.190	A
Cesium-137	-0.010		A			False Positive Test	0.271	
Cobalt-57	13.117	13.9	A		-5.6	9.7 - 18.1	0.352	A
Cobalt-60	13.450	14.0	A		-3.9	9.8 - 18.2	0.273	A
Hydrogen-3	266.45	250	A		6.6	175 - 325	3.34	N
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	9.053	9.0	A		0.6	6.3 - 11.7	0.261	A
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	0.0256	0.0096	A			Sensitivity Evaluation	0.006	
Plutonium-239/240	0.354	0.528	N		-33.0	0.370 - 0.686	0.032	A
Potassium-40	0.547		A			False Positive Test	1.035	
Radium-226	0.237	0.226	A		4.9	0.158 - 0.294	0.042	W

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	3.552	3.86	A		-8.0	2.70 - 5.02	0.381	A
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	0.050	0.0215	A	(17)		Sensitivity Evaluation	0.029	
Uranium-238	0.0056	0.0123	A	(17)		Sensitivity Evaluation	0.0042	
Zinc-65	0.277		A			False Positive Test	0.655	

Radiological Reference Date: August 1, 2021

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



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

*Laboratory Results For MAPEP-21-MaW45*

(FDOH01) Florida Dept. of Health, Mobile Environmental Radiological Lab

PO Box 680069

Orlando, FL 32868-0069

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.455	0.426	A		6.8	0.298 - 0.554	0.459	N
Cesium-134	9.773	10.4	A		-6.0	7.3 - 13.5	0.166	N
Cesium-137	0.064		A			False Positive Test	0.252	
Cobalt-57	12.963	13.9	A		-6.7	9.7 - 18.1	0.214	N
Cobalt-60	13.511	14.0	A		-3.5	9.8 - 18.2	0.211	N
Hydrogen-3	NR	250				175 - 325		
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	9.17	9.0	A		1.9	6.3 - 11.7	0.194	A
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	NR	0.0096				Sensitivity Evaluation		
Plutonium-239/240	NR	0.528				0.370 - 0.686		
Potassium-40	1.001		A			False Positive Test	1.302	
Radium-226	NR	0.226				0.158 - 0.294		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	3.86				2.70 - 5.02		
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	NR	0.0215				Sensitivity Evaluation		
Uranium-238	0.165	0.0123	A	(17)		Sensitivity Evaluation	1.65	
Zinc-65	0.1		A			False Positive Test	0.605	

Radiological Reference Date: August 1, 2021

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



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

*Laboratory Results For MAPEP-21-MaW45*

(FERM01) Fernald Project  
10995 Hamilton-Cleves Highway  
Harrison, OH 45030-9728

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag	
Antimony	NR	7.27			5.09 - 9.45			
Arsenic	NR	2.46			1.72 - 3.20			
Barium	NR	3.18			2.23 - 4.13			
Beryllium	NR	4.03			2.82 - 5.24			
Cadmium	NR	0.468			0.328 - 0.608			
Chromium	NR	2.48			1.74 - 3.22			
Cobalt	NR	6.04			4.23 - 7.85			
Copper	NR	8.29			5.80 - 10.78			
Lead	NR	3.00			2.10 - 3.90			
Mercury	NR	0.128			0.090 - 0.166			
Nickel	NR	0.00102			Sensitivity Evaluation			
Selenium	NR	0.411			0.288 - 0.534			
Technetium-99	NR	5.87E-6			4.11E-6 - 7.63E-6			
Thallium	NR	3.06			2.14 - 3.98			
Uranium-235	NR	7.0E-6			Sensitivity Evaluation			
Uranium-238	NR	9.9E-4			6.93E-4 - 1.29E-3			
Uranium-Total	0.001	1.00E-3	A	0.0	0.00070 - 0.00130	0.010	N	
Vanadium	NR	10.1			7.1 - 13.1			
Zinc	NR	8.42			5.89 - 10.95			

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag	
Americium-241	NR	0.426			0.298 - 0.554			
Cesium-134	NR	10.4			7.3 - 13.5			
Cesium-137	NR				False Positive Test			
Cobalt-57	NR	13.9			9.7 - 18.1			
Cobalt-60	NR	14.0			9.8 - 18.2			
Hydrogen-3	NR	250			175 - 325			
Iron-55	NR	49.8			34.9 - 64.7			
Manganese-54	NR	9.0			6.3 - 11.7			
Nickel-63	NR	39.5			27.7 - 51.4			
Plutonium-238	NR	0.0096			Sensitivity Evaluation			
Plutonium-239/240	NR	0.528			0.370 - 0.686			
Potassium-40	NR				False Positive Test			
Radium-226	NR	0.226			0.158 - 0.294			

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	3.86				2.70 - 5.02		
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	NR	0.0215				Sensitivity Evaluation		
Uranium-238	NR	0.0123				Sensitivity Evaluation		
Zinc-65	NR					False Positive Test		

Radiological Reference Date: August 1, 2021

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





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

### Laboratory Results For MAPEP-21-MaW45

(FNAL01) Fermi National Accelerator Laboratory (FermiLab)

PO Box 500, MS325

Batavia, IL 60510

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.426				0.298 - 0.554		
Cesium-134	10.1	10.4	A		-2.9	7.3 - 13.5	1.1	A
Cesium-137	0.32			A		False Positive Test	0.58	
Cobalt-57	13.7	13.9	A		-1.4	9.7 - 18.1	1.9	A
Cobalt-60	14.8	14.0	A		5.7	9.8 - 18.2	1.5	A
Hydrogen-3	258	250	A		3.2	175 - 325	10	A
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	9.0	9.0	A		0.0	6.3 - 11.7	1.4	W
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	NR	0.0096				Sensitivity Evaluation		
Plutonium-239/240	NR	0.528				0.370 - 0.686		
Potassium-40	-3.7			A		False Positive Test	9.7	
Radium-226	NR	0.226				0.158 - 0.294		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	3.86				2.70 - 5.02		
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	NR	0.0215				Sensitivity Evaluation		
Uranium-238	NR	0.0123				Sensitivity Evaluation		
Zinc-65	0.5		A			False Positive Test	1.4	

Radiological Reference Date: August 1, 2021

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



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

*Laboratory Results For MAPEP-21-MaW45*

(FSCL01) Forensic Science Center Lawrence Livermore Laboratory

7000 East Ave.

Livermore, CA 94550

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.426				0.298 - 0.554		
Cesium-134	10.54	10.4	A		1.3	7.3 - 13.5	0.6	A
Cesium-137	-0.3			A		False Positive Test	0.9	
Cobalt-57	13.10	13.9	A		-5.8	9.7 - 18.1	0.61	A
Cobalt-60	14.29	14.0	A		2.1	9.8 - 18.2	0.91	A
Hydrogen-3	NR	250				175 - 325		
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	9.04	9.0	A		0.4	6.3 - 11.7	0.91	A
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	NR	0.0096				Sensitivity Evaluation		
Plutonium-239/240	NR	0.528				0.370 - 0.686		
Potassium-40	-9.7			A		False Positive Test	20.8	
Radium-226	NR	0.226				0.158 - 0.294		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	3.86				2.70 - 5.02		
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	NR	0.0215				Sensitivity Evaluation		
Uranium-238	NR	0.0123				Sensitivity Evaluation		
Zinc-65	-1.3		A			False Positive Test	1.7	

Radiological Reference Date: August 1, 2021

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



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

Laboratory Results For MAPEP-21-MaW45

(GENE01) GEL Laboratories, LLC

2040 Savage Road

Charleston, SC 29407

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	6.92	7.27	A		-4.8	5.09 - 9.45	1.38	W
Arsenic	2.25	2.46	A		-8.5	1.72 - 3.20	0.451	W
Barium	3.02	3.18	A		-5.0	2.23 - 4.13	0.603	W
Beryllium	3.82	4.03	A		-5.2	2.82 - 5.24	0.765	W
Cadmium	0.426	0.468	A		-9.0	0.328 - 0.608	0.0851	W
Chromium	2.38	2.48	A		-4.0	1.74 - 3.22	0.477	W
Cobalt	5.7	6.04	A		-5.6	4.23 - 7.85	1.14	W
Copper	7.93	8.29	A		-4.3	5.80 - 10.78	1.59	W
Lead	2.87	3.00	A		-4.3	2.10 - 3.90	0.574	W
Mercury	0.107	0.128	A		-16.4	0.090 - 0.166	0.0214	W
Nickel	0.0004	0.00102	A	(17)		Sensitivity Evaluation	0.000215	
Selenium	0.402	0.411	A		-2.2	0.288 - 0.534	0.0803	W
Technetium-99	5.60E-6	5.87E-6	A		-4.6	4.11E-6 - 7.63E-6	6.88E-7	A
Thallium	3.00	3.06	A		-2.0	2.14 - 3.98	0.600	W
Uranium-235	7.40E-6	7.0E-6	A	(17)		Sensitivity Evaluation	3.65E-6	
Uranium-238	0.000959	9.9E-4	A		-3.1	6.93E-4 - 1.29E-3	0.000193	W
Uranium-Total	0.000959	1.00E-3	A		-4.1	0.00070 - 0.00130	0.000193	W
Vanadium	9.84	10.1	A		-2.6	7.1 - 13.1	1.97	W
Zinc	7.52	8.42	A		-10.7	5.89 - 10.95	1.5	W

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.407	0.426	A		-4.5	0.298 - 0.554	0.0304	A
Cesium-134	9.52	10.4	A		-8.5	7.3 - 13.5	0.476	A
Cesium-137	-.0411		A			False Positive Test	0.0719	
Cobalt-57	14	13.9	A		0.7	9.7 - 18.1	0.606	A
Cobalt-60	14.5	14.0	A		3.6	9.8 - 18.2	0.764	A
Hydrogen-3	231	250	A		-7.6	175 - 325	30.8	A
Iron-55	47.9	49.8	A		-3.8	34.9 - 64.7	5.94	A
Manganese-54	9.47	9.0	A		5.2	6.3 - 11.7	0.477	A
Nickel-63	41.4	39.5	A		4.8	27.7 - 51.4	4.75	A
Plutonium-238	-0.00169	0.0096	A	(17)		Sensitivity Evaluation	0.00778	
Plutonium-239/240	0.470	0.528	A		-11.0	0.370 - 0.686	0.0332	A
Potassium-40	0.005		A			False Positive Test	1.06	
Radium-226	0.310	0.226	N		37.2	0.158 - 0.294	0.0438	A

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	3.5	3.86	A		-9.3	2.70 - 5.02	0.295	A
Technetium-99	3.79	3.71	A		2.2	2.60 - 4.82	0.751	W
Uranium-234	0.0203	0.0215	A	(17)		Sensitivity Evaluation	0.00782	
Uranium-238	0.00975	0.0123	A	(17)		Sensitivity Evaluation	0.00604	
Zinc-65	0.122		A			False Positive Test	0.162	

Radiological Reference Date: August 1, 2021

**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

(2) = False Negative

(4) = Sensitivity Evaluation

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(17) = NOT DETECTED - reported a statistically zero result

(28) = Not Reporting Previously Reported Analyte



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

*Laboratory Results For MAPEP-21-MaW45*

(GPCL01) Georgia Power Company Environmental Laboratory  
2480 Maner Road  
Atlanta, GA 30339

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.426				0.298 - 0.554		
Cesium-134	10.57	10.4	A		1.6	7.3 - 13.5	.8	A
Cesium-137	.01		A			False Positive Test	.34	
Cobalt-57	14.07	13.9	A		1.2	9.7 - 18.1	1.31	A
Cobalt-60	14.19	14.0	A		1.4	9.8 - 18.2	1.1	A
Hydrogen-3	243.17	250	A		-2.7	175 - 325	12.95	A
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	9.6	9.0	A		6.7	6.3 - 11.7	.88	A
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	NR	0.0096				Sensitivity Evaluation		
Plutonium-239/240	NR	0.528				0.370 - 0.686		
Potassium-40	NR		N	(11)		False Positive Test		
Radium-226	NR	0.226				0.158 - 0.294		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	3.5798	3.86	A		-7.3	2.70 - 5.02	.1904	A
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	NR	0.0215				Sensitivity Evaluation		
Uranium-238	NR	0.0123				Sensitivity Evaluation		
Zinc-65	-.08		A			False Positive Test	.75	

Radiological Reference Date: August 1, 2021

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





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

Laboratory Results For MAPEP-21-MaW45  
 (HCAL01) Lawrence Livermore National Laboratory  
 Analytical Services and Instrumentation Analytical Lab  
 Livermore, CA 94550

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.426				0.298 - 0.554		
Cesium-134	NR	10.4				7.3 - 13.5		
Cesium-137	NR					False Positive Test		
Cobalt-57	NR	13.9				9.7 - 18.1		
Cobalt-60	NR	14.0				9.8 - 18.2		
Hydrogen-3	255	250	A		2.0	175 - 325	14	A
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	NR	9.0				6.3 - 11.7		
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	NR	0.0096				Sensitivity Evaluation		
Plutonium-239/240	NR	0.528				0.370 - 0.686		
Potassium-40	NR					False Positive Test		
Radium-226	NR	0.226				0.158 - 0.294		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	3.86				2.70 - 5.02		
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	NR	0.0215				Sensitivity Evaluation		
Uranium-238	NR	0.0123				Sensitivity Evaluation		
Zinc-65	NR					False Positive Test		

Radiological Reference Date: August 1, 2021

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



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

*Laboratory Results For MAPEP-21-MaW45*

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

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.426				0.298 - 0.554		
Cesium-134	10.56	10.4	A		1.5	7.3 - 13.5	0.7015	A
Cesium-137	0.02229			A		False Positive Test	0.03761	
Cobalt-57	14.35	13.9	A		3.2	9.7 - 18.1	0.9732	A
Cobalt-60	14.20	14.0	A		1.4	9.8 - 18.2	0.8763	A
Hydrogen-3	253	250	A		1.2	175 - 325	8.66	A
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	10.08	9.0	A		12.0	6.3 - 11.7	0.6893	A
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	NR	0.0096				Sensitivity Evaluation		
Plutonium-239/240	NR	0.528				0.370 - 0.686		
Potassium-40	-0.06093			A		False Positive Test	1.359	
Radium-226	NR	0.226				0.158 - 0.294		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	3.86				2.70 - 5.02		
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	NR	0.0215				Sensitivity Evaluation		
Uranium-238	NR	0.0123				Sensitivity Evaluation		
Zinc-65	NR		(6)			False Positive Test		

Radiological Reference Date: August 1, 2021

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



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

Laboratory Results For MAPEP-21-MaW45

(HPAC99) PHE, CRCE Glasgow

155 Hardgate Road

Glasgow, Scotland G51 4LS

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.37	0.426	A		-13.1	0.298 - 0.554	0.02	A
Cesium-134	10.1	10.4	A		-2.9	7.3 - 13.5	0.2	N
Cesium-137	0.4		A			False Positive Test	0.4	
Cobalt-57	13.2	13.9	A		-5.0	9.7 - 18.1	0.4	A
Cobalt-60	13.6	14.0	A		-2.9	9.8 - 18.2	0.4	A
Hydrogen-3	NR	250				175 - 325		
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	8.80	9.0	A		-2.2	6.3 - 11.7	0.3	A
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	0.010	0.0096	A			Sensitivity Evaluation	0.002	
Plutonium-239/240	0.46	0.528	A		-12.9	0.370 - 0.686	0.03	A
Potassium-40	3.6		A			False Positive Test	3.6	
Radium-226	7.4	0.226	N		3174.3	0.158 - 0.294	7.4	N

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	3.86				2.70 - 5.02		
Technetium-99	NR	3.71	N	(28)		2.60 - 4.82		
Uranium-234	NR	0.0215				Sensitivity Evaluation		
Uranium-238	NR	0.0123				Sensitivity Evaluation		
Zinc-65	1.0		A			False Positive Test	1.0	

Radiological Reference Date: August 1, 2021

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



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

Laboratory Results For MAPEP-21-MaW45  
 (IAEA99) International Atomic Energy Agency  
 Agency's Laboratories Seibersdorf  
 Seibersdorf, Austria A-2444

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	2.43	2.46	A		-1.2	1.72 - 3.20	0.10	A
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	0.481	0.468	A		2.8	0.328 - 0.608	0.013	A
Chromium	2.62	2.48	A		5.6	1.74 - 3.22	0.08	A
Cobalt	6.43	6.04	A		6.5	4.23 - 7.85	0.19	A
Copper	8.75	8.29	A		5.5	5.80 - 10.78	0.26	A
Lead	3.16	3.00	A		5.3	2.10 - 3.90	0.10	A
Mercury	NR	0.128				0.090 - 0.166		
Nickel	0.0050	0.00102	A			Sensitivity Evaluation	0.0015	
Selenium	0.44	0.411	A		7.1	0.288 - 0.534	0.06	A
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	0.0000068	7.0E-6	A			Sensitivity Evaluation	0.000000	
Uranium-238	0.000961	9.9E-4	A		-2.9	6.93E-4 - 1.29E-3	0.000036	A
Uranium-Total	0.000968	1.00E-3	A		-3.2	0.00070 - 0.00130	0.000036	A
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	9.22	8.42	A		9.5	5.89 - 10.95	0.27	A

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.45	0.426	A		5.6	0.298 - 0.554	0.04	A
Cesium-134	10.3	10.4	A		-1.0	7.3 - 13.5	0.4	A
Cesium-137	0.06		A			False Positive Test	0.05	
Cobalt-57	13.7	13.9	A		-1.4	9.7 - 18.1	0.4	A
Cobalt-60	14.3	14.0	A		2.1	9.8 - 18.2	0.5	A
Hydrogen-3	NR	250				175 - 325		
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	8.9	9.0	A		-1.1	6.3 - 11.7	0.3	A
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	0.0061	0.0096	A			Sensitivity Evaluation	0.0007	
Plutonium-239/240	0.47	0.528	A		-11.0	0.370 - 0.686	0.01	A
Potassium-40	0.5		A			False Positive Test	0.6	
Radium-226	0.237	0.226	A		4.9	0.158 - 0.294	0.012	A

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	3.86				2.70 - 5.02		
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	NR	0.0215				Sensitivity Evaluation		
Uranium-238	NR	0.0123				Sensitivity Evaluation		
Zinc-65	0.3		A			False Positive Test	0.2	

Radiological Reference Date: August 1, 2021

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





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

*Laboratory Results For MAPEP-21-MaW45*

(IEMA01) Illinois Emergency Management Agency Radiochemistry Laboratory  
1301 Knotts St.  
Springfield, IL 62703

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	.403	0.426	A		-5.4	0.298 - 0.554	.023	A
Cesium-134	10.4	10.4	A		0.0	7.3 - 13.5	0.224	A
Cesium-137	.0207		A			False Positive Test	.134	
Cobalt-57	13.9	13.9	A		0.0	9.7 - 18.1	.383	A
Cobalt-60	14.2	14.0	A		1.4	9.8 - 18.2	0.33	A
Hydrogen-3	244.8	250	A		-2.1	175 - 325	3.6	N
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	9.3	9.0	A		3.3	6.3 - 11.7	.334	A
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	.0121	0.0096	A	(17)		Sensitivity Evaluation	.0041	
Plutonium-239/240	.462	0.528	A		-12.5	0.370 - 0.686	.025	A
Potassium-40	1.01		A			False Positive Test	.8088	
Radium-226	NR	0.226				0.158 - 0.294		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	3.34	3.86	A		-13.5	2.70 - 5.02	0.16	A
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	.028	0.0215	A			Sensitivity Evaluation	.005	
Uranium-238	.012	0.0123	A			Sensitivity Evaluation	.003	
Zinc-65	.0293		A			False Positive Test	.32	

Radiological Reference Date: August 1, 2021

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



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

Laboratory Results For MAPEP-21-MaW45  
 (ISUE01) ISU Environmental Monitoring Laboratory  
 785 5th 8th Ave Rm B107  
 Pocatello, Idaho 83209

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.426				0.298 - 0.554		
Cesium-134	9.93	10.4	A		-4.5	7.3 - 13.5	0.28	A
Cesium-137	0.05			A		False Positive Test	0.06	
Cobalt-57	13.79	13.9	A		-0.8	9.7 - 18.1	0.36	A
Cobalt-60	14.26	14.0	A		1.9	9.8 - 18.2	0.26	N
Hydrogen-3	267.2	250	A		6.9	175 - 325	5.22	N
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	9.25	9.0	A		2.8	6.3 - 11.7	0.27	A
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	NR	0.0096				Sensitivity Evaluation		
Plutonium-239/240	NR	0.528				0.370 - 0.686		
Potassium-40	0.54			A		False Positive Test	0.75	
Radium-226	NR	0.226				0.158 - 0.294		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	3.86				2.70 - 5.02		
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	NR	0.0215				Sensitivity Evaluation		
Uranium-238	NR	0.0123				Sensitivity Evaluation		
Zinc-65	0.14		A			False Positive Test	0.13	

Radiological Reference Date: August 1, 2021

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



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

*Laboratory Results For MAPEP-21-MaW45*

(ISUP01) ISU - Department of Physics/Health Physics/EAL

785 S. 8th Ave, Rm 120

Pocatello, ID 83209-8106

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.426				0.298 - 0.554		
Cesium-134	9.73	10.4	A		-6.4	7.3 - 13.5	.448	A
Cesium-137	-.0831			A		False Positive Test	.154	
Cobalt-57	13.8	13.9	A		-0.7	9.7 - 18.1	.637	A
Cobalt-60	14.3	14.0	A		2.1	9.8 - 18.2	.657	A
Hydrogen-3	240.42	250	A		-3.8	175 - 325	10.82	A
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	9.27	9.0	A		3.0	6.3 - 11.7	.426	A
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	NR	0.0096				Sensitivity Evaluation		
Plutonium-239/240	NR	0.528				0.370 - 0.686		
Potassium-40	2.13			A		False Positive Test	1.16	
Radium-226	NR	0.226				0.158 - 0.294		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	3.86				2.70 - 5.02		
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	NR	0.0215				Sensitivity Evaluation		
Uranium-238	NR	0.0123				Sensitivity Evaluation		
Zinc-65	0.126		A			False Positive Test	.278	

Radiological Reference Date: August 1, 2021

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



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

### Laboratory Results For MAPEP-21-MaW45

(JAEC99) Research Laboratories and Information Directorate

Jordan Atomic Energy Commission

Amman, Jordan 70 (11934)

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	2.40	2.46	A		-2.4	1.72 - 3.20	0.26	A
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	2.44	2.48	A		-1.6	1.74 - 3.22	0.17	A
Cobalt	5.88	6.04	A		-2.6	4.23 - 7.85	0.67	A
Copper	7.85	8.29	A		-5.3	5.80 - 10.78	0.86	A
Lead	3.45	3.00	A		15.0	2.10 - 3.90	0.44	A
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	3.51	3.06	A		14.7	2.14 - 3.98	0.35	A
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	9.58	10.1	A		-5.1	7.1 - 13.1	1.28	A
Zinc	8.55	8.42	A		1.5	5.89 - 10.95	0.73	A

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.426				0.298 - 0.554		
Cesium-134	10.56	10.4	A		1.5	7.3 - 13.5	0.40	A
Cesium-137	NR		N	(11)		False Positive Test		
Cobalt-57	13.23	13.9	A		-4.8	9.7 - 18.1	0.64	A
Cobalt-60	13.77	14.0	A		-1.6	9.8 - 18.2	0.86	A
Hydrogen-3	NR	250				175 - 325		
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	9.27	9.0	A		3.0	6.3 - 11.7	0.67	A
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	NR	0.0096				Sensitivity Evaluation		
Plutonium-239/240	NR	0.528				0.370 - 0.686		
Potassium-40	NR		N	(11)		False Positive Test		
Radium-226	NR	0.226				0.158 - 0.294		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	3.86				2.70 - 5.02		
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	0.027	0.0215	A			Sensitivity Evaluation	0.002	
Uranium-238	0.009	0.0123	A			Sensitivity Evaluation	0.001	
Zinc-65	NR		N	(11)		False Positive Test		

Radiological Reference Date: August 1, 2021

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





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

*Laboratory Results For MAPEP-21-MaW45*

(JLNN01) Jefferson Laboratory

111 Hadron Drive

Newport News, VA 23606

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.3394	0.426	W		-20.3	0.298 - 0.554	0.06685	W
Cesium-134	9.676	10.4	A		-7.0	7.3 - 13.5	0.2080	A
Cesium-137	25.35		N	(1)		False Positive Test	0.07811	
Cobalt-57	14.35	13.9	A		3.2	9.7 - 18.1	0.3472	A
Cobalt-60	14.02	14.0	A		0.1	9.8 - 18.2	0.3153	A
Hydrogen-3	190.78	250	W		-23.7	175 - 325	28.16	A
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	9.130	9.0	A		1.4	6.3 - 11.7	0.3016	A
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	NR	0.0096				Sensitivity Evaluation		
Plutonium-239/240	NR	0.528				0.370 - 0.686		
Potassium-40	0.1868		A			False Positive Test	1.016	
Radium-226	NR	0.226				0.158 - 0.294		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	3.86				2.70 - 5.02		
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	NR	0.0215				Sensitivity Evaluation		
Uranium-238	NR	0.0123				Sensitivity Evaluation		
Zinc-65	-0.09363		A			False Positive Test	0.177	

Radiological Reference Date: August 1, 2021

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



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

Laboratory Results For MAPEP-21-MaW45  
 (LANL01) Los Alamos National Laboratory  
 P. O. Box 1663  
 Los Alamos, NM 87545

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.426				0.298 - 0.554		
Cesium-134	10.1	10.4	A		-2.9	7.3 - 13.5	0.4	A
Cesium-137	NR		N	(11)		False Positive Test		
Cobalt-57	14.5	13.9	A		4.3	9.7 - 18.1	1.0	A
Cobalt-60	14.1	14.0	A		0.7	9.8 - 18.2	0.6	A
Hydrogen-3	NR	250				175 - 325		
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	10.1	9.0	A		12.2	6.3 - 11.7	0.4	A
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	NR	0.0096				Sensitivity Evaluation		
Plutonium-239/240	NR	0.528				0.370 - 0.686		
Potassium-40	NR		N	(11)		False Positive Test		
Radium-226	NR	0.226				0.158 - 0.294		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	3.86				2.70 - 5.02		
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	NR	0.0215				Sensitivity Evaluation		
Uranium-238	NR	0.0123				Sensitivity Evaluation		
Zinc-65	NR		N	(11)		False Positive Test		

Radiological Reference Date: August 1, 2021

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



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

*Laboratory Results For MAPEP-21-MaW45*

(LAWR01) LAWRENCE BERKELEY NATIONAL LABORATORY  
1 CYCLOTRON RD.  
BERKELEY, CA 94720

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.426				0.298 - 0.554		
Cesium-134	11.00	10.4	A		5.8	7.3 - 13.5	0.6825	A
Cesium-137	-0.6173			A		False Positive Test	6.173	
Cobalt-57	13.82	13.9	A		-0.6	9.7 - 18.1	0.7842	A
Cobalt-60	14.67	14.0	A		4.8	9.8 - 18.2	0.8915	A
Hydrogen-3	NR	250				175 - 325		
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	9.083	9.0	A		0.9	6.3 - 11.7	0.5911	A
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	NR	0.0096				Sensitivity Evaluation		
Plutonium-239/240	NR	0.528				0.370 - 0.686		
Potassium-40	2.878			A		False Positive Test	3.93	
Radium-226	NR	0.226				0.158 - 0.294		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	3.86				2.70 - 5.02		
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	NR	0.0215				Sensitivity Evaluation		
Uranium-238	NR	0.0123				Sensitivity Evaluation		
Zinc-65	0.1989		A			False Positive Test	0.4117	

Radiological Reference Date: August 1, 2021

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



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

## Laboratory Results For MAPEP-21-MaW45

(LOCK03) Advanced Test Reactor (ATR) Complex Radioanalytical Laboratory

INL/Battelle Energy Alliance, LLC

Idaho Falls, ID 83415-7111

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	7.514	7.27	A		3.4	5.09 - 9.45	0.652	A
Arsenic	2.168	2.46	A		-11.9	1.72 - 3.20	0.187	A
Barium	3.098	3.18	A		-2.6	2.23 - 4.13	0.138	A
Beryllium	3.972	4.03	A		-1.4	2.82 - 5.24	0.310	A
Cadmium	0.454	0.468	A		-3.0	0.328 - 0.608	0.023	A
Chromium	2.409	2.48	A		-2.9	1.74 - 3.22	0.178	A
Cobalt	5.907	6.04	A		-2.2	4.23 - 7.85	0.474	A
Copper	7.967	8.29	A		-3.9	5.80 - 10.78	0.703	A
Lead	2.934	3.00	A		-2.2	2.10 - 3.90	0.219	A
Mercury	0.101	0.128	W		-21.1	0.090 - 0.166	0.032	N
Nickel	0.0043	0.00102	N	(4)		Sensitivity Evaluation	0.0004	
Selenium	0.368	0.411	A		-10.5	0.288 - 0.534	0.019	A
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	3.080	3.06	A		0.7	2.14 - 3.98	0.172	A
Uranium-235	0.0000076	7.0E-6	A			Sensitivity Evaluation	0.000000	
Uranium-238	0.00100	9.9E-4	A		1.0	6.93E-4 - 1.29E-3	0.00006	A
Uranium-Total	0.00101	1.00E-3	A		1.0	0.00070 - 0.00130	0.00006	A
Vanadium	10.02	10.1	A		-0.8	7.1 - 13.1	0.93	A
Zinc	8.270	8.42	A		-1.8	5.89 - 10.95	0.633	A

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.426				0.298 - 0.554		
Cesium-134	9.33	10.4	A		-10.3	7.3 - 13.5	0.49	A
Cesium-137	0.02		A			False Positive Test	0.05	
Cobalt-57	13.40	13.9	A		-3.6	9.7 - 18.1	0.70	A
Cobalt-60	13.33	14.0	A		-4.8	9.8 - 18.2	0.77	A
Hydrogen-3	260.12	250	A		4.0	175 - 325	16.29	A
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	9.11	9.0	A		1.2	6.3 - 11.7	0.48	A
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	NR	0.0096				Sensitivity Evaluation		
Plutonium-239/240	NR	0.528				0.370 - 0.686		
Potassium-40	-0.09		A			False Positive Test	0.43	
Radium-226	NR	0.226				0.158 - 0.294		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	3.86				2.70 - 5.02		
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	NR	0.0215				Sensitivity Evaluation		
Uranium-238	NR	0.0123				Sensitivity Evaluation		
Zinc-65	-0.06		A			False Positive Test	0.09	

Radiological Reference Date: August 1, 2021

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





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

*Laboratory Results For MAPEP-21-MaW45*

(LZCA01) ACZ Laboratories, Inc  
2273 Downhill Drive  
Steamboat Springs, CO 80487

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag	
Antimony	NR	7.27			5.09 - 9.45			
Arsenic	NR	2.46			1.72 - 3.20			
Barium	NR	3.18			2.23 - 4.13			
Beryllium	NR	4.03			2.82 - 5.24			
Cadmium	NR	0.468			0.328 - 0.608			
Chromium	NR	2.48			1.74 - 3.22			
Cobalt	NR	6.04			4.23 - 7.85			
Copper	NR	8.29			5.80 - 10.78			
Lead	NR	3.00			2.10 - 3.90			
Mercury	NR	0.128			0.090 - 0.166			
Nickel	NR	0.00102			Sensitivity Evaluation			
Selenium	NR	0.411			0.288 - 0.534			
Technetium-99	NR	5.87E-6			4.11E-6 - 7.63E-6			
Thallium	NR	3.06			2.14 - 3.98			
Uranium-235	NR	7.0E-6			Sensitivity Evaluation			
Uranium-238	NR	9.9E-4			6.93E-4 - 1.29E-3			
Uranium-Total	NR	1.00E-3			0.00070 - 0.00130			
Vanadium	NR	10.1			7.1 - 13.1			
Zinc	NR	8.42			5.89 - 10.95			

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag	
Americium-241	NR	0.426			0.298 - 0.554			
Cesium-134	NR	10.4			7.3 - 13.5			
Cesium-137	NR				False Positive Test			
Cobalt-57	NR	13.9			9.7 - 18.1			
Cobalt-60	NR	14.0			9.8 - 18.2			
Hydrogen-3	NR	250			175 - 325			
Iron-55	NR	49.8			34.9 - 64.7			
Manganese-54	NR	9.0			6.3 - 11.7			
Nickel-63	NR	39.5			27.7 - 51.4			
Plutonium-238	NR	0.0096			Sensitivity Evaluation			
Plutonium-239/240	NR	0.528			0.370 - 0.686			
Potassium-40	NR				False Positive Test			
Radium-226	0.314	0.226	N	38.9	0.158 - 0.294	0.0454	A	

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	3.86				2.70 - 5.02		
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	NR	0.0215				Sensitivity Evaluation		
Uranium-238	NR	0.0123				Sensitivity Evaluation		
Zinc-65	NR					False Positive Test		

Radiological Reference Date: August 1, 2021

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



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

Laboratory Results For MAPEP-21-MaW45  
 (MART03) Radioactive Material Analysis Laboratory  
 ORNL  
 Oak Ridge, TN 37830

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	7.31	7.27	A		0.6	5.09 - 9.45	0.73	A
Arsenic	2.41	2.46	A		-2.0	1.72 - 3.20	0.24	A
Barium	3.15	3.18	A		-0.9	2.23 - 4.13	0.32	A
Beryllium	4.02	4.03	A		-0.2	2.82 - 5.24	0.40	A
Cadmium	0.467	0.468	A		-0.2	0.328 - 0.608	0.047	A
Chromium	2.49	2.48	A		0.4	1.74 - 3.22	0.25	A
Cobalt	5.98	6.04	A		-1.0	4.23 - 7.85	0.60	A
Copper	8.45	8.29	A		1.9	5.80 - 10.78	0.85	A
Lead	3.08	3.00	A		2.7	2.10 - 3.90	0.31	A
Mercury	0.13	0.128	A		1.6	0.090 - 0.166	0.013	A
Nickel	0.0011	0.00102	A	(17)		Sensitivity Evaluation	0.0011	
Selenium	0.396	0.411	A		-3.7	0.288 - 0.534	0.040	A
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	3.13	3.06	A		2.3	2.14 - 3.98	0.31	A
Uranium-235	0.0000071	7.0E-6	A			Sensitivity Evaluation	0.000000	
Uranium-238	0.000991	9.9E-4	A		0.1	6.93E-4 - 1.29E-3	0.000099	A
Uranium-Total	0.000998	1.00E-3	A		-0.2	0.00070 - 0.00130	0.000100	A
Vanadium	9.81	10.1	A		-2.9	7.1 - 13.1	0.98	A
Zinc	8.12	8.42	A		-3.6	5.89 - 10.95	0.81	A

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.433	0.426	A		1.6	0.298 - 0.554	0.028	A
Cesium-134	10.16	10.4	A		-2.3	7.3 - 13.5	0.23	A
Cesium-137	0.05		A			False Positive Test	0.16	
Cobalt-57	13.50	13.9	A		-2.9	9.7 - 18.1	0.30	A
Cobalt-60	13.56	14.0	A		-3.1	9.8 - 18.2	0.26	N
Hydrogen-3	237.2	250	A		-5.1	175 - 325	8.8	A
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	9.04	9.0	A		0.4	6.3 - 11.7	0.26	A
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	0.005	0.0096	A	(17)		Sensitivity Evaluation	0.006	
Plutonium-239/240	0.420	0.528	W		-20.5	0.370 - 0.686	0.025	A
Potassium-40	2.6		A			False Positive Test	1.4	
Radium-226	NR	0.226				0.158 - 0.294		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	2.89	3.86	W		-25.1	2.70 - 5.02	0.11	A
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	0.023	0.0215	A			Sensitivity Evaluation	0.005	
Uranium-238	0.012	0.0123	A			Sensitivity Evaluation	0.003	
Zinc-65	0.03		A			False Positive Test	0.42	

Radiological Reference Date: August 1, 2021

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



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

Laboratory Results For MAPEP-21-MaW45  
 (MDPH01) MDPH-Radiation Control Program  
 MERL-Room 002  
 Jamaica Plain, MA 02130-3597

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.43	0.426	A		0.9	0.298 - 0.554	0.06	A
Cesium-134	9.24	10.4	A		-11.2	7.3 - 13.5	0.26	A
Cesium-137	NR		N	(11)		False Positive Test		
Cobalt-57	13.92	13.9	A		0.1	9.7 - 18.1	0.54	A
Cobalt-60	14.02	14.0	A		0.1	9.8 - 18.2	0.47	A
Hydrogen-3	NR	250				175 - 325		
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	9.31	9.0	A		3.4	6.3 - 11.7	0.29	A
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	NR	0.0096				Sensitivity Evaluation		
Plutonium-239/240	NR	0.528				0.370 - 0.686		
Potassium-40	14.13		N	(1)		False Positive Test	0.81	
Radium-226	NR	0.226				0.158 - 0.294		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	3.86				2.70 - 5.02		
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	NR	0.0215				Sensitivity Evaluation		
Uranium-238	NR	0.0123				Sensitivity Evaluation		
Zinc-65	NR		N	(11)		False Positive Test		

Radiological Reference Date: August 1, 2021

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



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

*Laboratory Results For MAPEP-21-MaW45*

(MNDH01) Minnesota Department of Health, Public Health Lab. Division  
601 Robert St. N.  
St. Paul, MN 55155

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	-0.022007	0.426	N		-105.2	0.298 - 0.554	2.476	N
Cesium-134	9.7700	10.4	A		-6.1	7.3 - 13.5	.2591	A
Cesium-137	0.0056412		A			False Positive Test	0.1865	
Cobalt-57	14.314	13.9	A		3.0	9.7 - 18.1	0.2774	N
Cobalt-60	14.400	14.0	A		2.9	9.8 - 18.2	0.2762	N
Hydrogen-3	NR	250				175 - 325		
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	9.9632	9.0	A		10.7	6.3 - 11.7	0.3309	A
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	NR	0.0096				Sensitivity Evaluation		
Plutonium-239/240	NR	0.528				0.370 - 0.686		
Potassium-40	-0.070737		A			False Positive Test	2.029	
Radium-226	NR	0.226				0.158 - 0.294		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	3.86				2.70 - 5.02		
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	NR	0.0215				Sensitivity Evaluation		
Uranium-238	NR	0.0123				Sensitivity Evaluation		
Zinc-65	-0.10447		A			False Positive Test	0.4458	

Radiological Reference Date: August 1, 2021

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





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

*Laboratory Results For MAPEP-21-MaW45*

(NARL01) National Analytical Radiation Environmental Laboratory

540 S. Morris Ave.

Montgomery, AL 36115-2601

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.399	0.426	A		-6.3	0.298 - 0.554	0.0215	A
Cesium-134	10.5	10.4	A		1.0	7.3 - 13.5	0.578	A
Cesium-137	0.00402			A		False Positive Test	0.0392	
Cobalt-57	14.0	13.9	A		0.7	9.7 - 18.1	0.772	A
Cobalt-60	14.2	14.0	A		1.4	9.8 - 18.2	0.752	A
Hydrogen-3	264	250	A		5.6	175 - 325	7.18	A
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	9.39	9.0	A		4.3	6.3 - 11.7	0.520	A
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	0.00776	0.0096	A			Sensitivity Evaluation	0.00207	
Plutonium-239/240	0.444	0.528	A		-15.9	0.370 - 0.686	0.0207	A
Potassium-40	-0.166			A		False Positive Test	0.370	
Radium-226	0.220	0.226	A		-2.7	0.158 - 0.294	0.0145	A

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	3.34	3.86	A		-13.5	2.70 - 5.02	0.112	A
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	0.0209	0.0215	A			Sensitivity Evaluation	0.00207	
Uranium-238	0.0119	0.0123	A			Sensitivity Evaluation	0.00151	
Zinc-65	0.0639		A			False Positive Test	0.0929	

Radiological Reference Date: August 1, 2021

**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

(2) = False Negative

(4) = Sensitivity Evaluation

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(17) = NOT DETECTED - reported a statistically zero result

(28) = Not Reporting Previously Reported Analyte



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

*Laboratory Results For MAPEP-21-MaW45*

(NARL02) USEPA - NAREL - MERL

540 S Morris Ave

Montgomery, AL 36115

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.426				0.298 - 0.554		
Cesium-134	10.4	10.4	A		0.0	7.3 - 13.5	0.200	N
Cesium-137	0.0103			A		False Positive Test	0.0690	
Cobalt-57	13.6	13.9	A		-2.2	9.7 - 18.1	0.240	N
Cobalt-60	13.3	14.0	A		-5.0	9.8 - 18.2	0.280	A
Hydrogen-3	NR	250				175 - 325		
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	8.83	9.0	A		-1.9	6.3 - 11.7	0.260	A
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	NR	0.0096				Sensitivity Evaluation		
Plutonium-239/240	NR	0.528				0.370 - 0.686		
Potassium-40	-0.238			A		False Positive Test	0.350	
Radium-226	NR	0.226				0.158 - 0.294		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	3.86				2.70 - 5.02		
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	NR	0.0215				Sensitivity Evaluation		
Uranium-238	NR	0.0123				Sensitivity Evaluation		
Zinc-65	0.188		A			False Positive Test	0.0800	

Radiological Reference Date: August 1, 2021

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



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

*Laboratory Results For MAPEP-21-MaW45*

(NESI01) BWXT-Radioisotope & Analytical Chemistry Laboratory

Lynchburg Technology Center

Lynchburg, VA 24504-5447

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	6.99	7.27	A		-3.9	5.09 - 9.45	0.10	N
Arsenic	2.24	2.46	A		-8.9	1.72 - 3.20	0.21	A
Barium	3.06	3.18	A		-3.8	2.23 - 4.13	0.05	N
Beryllium	4.05	4.03	A		0.5	2.82 - 5.24	0.06	N
Cadmium	0.45	0.468	A		-3.8	0.328 - 0.608	0.02	A
Chromium	2.44	2.48	A		-1.6	1.74 - 3.22	0.04	N
Cobalt	5.88	6.04	A		-2.6	4.23 - 7.85	0.09	N
Copper	8.13	8.29	A		-1.9	5.80 - 10.78	0.12	N
Lead	2.98	3.00	A		-0.7	2.10 - 3.90	0.05	N
Mercury	0.122	0.128	A		-4.7	0.090 - 0.166	0.009	A
Nickel	0.028	0.00102	A	(17)		Sensitivity Evaluation	0.078	
Selenium	0.388	0.411	A		-5.6	0.288 - 0.534	0.096	W
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	2.85	3.06	A		-6.9	2.14 - 3.98	0.05	N
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	10.0	10.1	A		-1.0	7.1 - 13.1	0.14	N
Zinc	7.79	8.42	A		-7.5	5.89 - 10.95	0.11	N

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.396	0.426	A		-7.0	0.298 - 0.554	0.023	A
Cesium-134	9.09	10.4	A		-12.6	7.3 - 13.5	0.38	A
Cesium-137	0.201		A			False Positive Test	0.168	
Cobalt-57	13.9	13.9	A		0.0	9.7 - 18.1	0.36	A
Cobalt-60	14.3	14.0	A		2.1	9.8 - 18.2	0.43	A
Hydrogen-3	262.8	250	A		5.1	175 - 325	8.77	A
Iron-55	37.7	49.8	W		-24.3	34.9 - 64.7	2.82	A
Manganese-54	9.21	9.0	A		2.3	6.3 - 11.7	0.37	A
Nickel-63	45.4	39.5	A		14.9	27.7 - 51.4	3.72	A
Plutonium-238	0.006	0.0096	A	(17)		Sensitivity Evaluation	0.008	
Plutonium-239/240	0.412	0.528	W		-22.0	0.370 - 0.686	0.021	A
Potassium-40	11.1		N	(1)		False Positive Test	1.37	
Radium-226	NR	0.226				0.158 - 0.294		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	2.51	3.86	N		-35.0	2.70 - 5.02	0.26	A
Technetium-99	3.92	3.71	A		5.7	2.60 - 4.82	0.16	A
Uranium-234	0.024	0.0215	A			Sensitivity Evaluation	0.005	
Uranium-238	0.018	0.0123	A			Sensitivity Evaluation	0.004	
Zinc-65	0.319		A			False Positive Test	0.452	

Radiological Reference Date: August 1, 2021

**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

(2) = False Negative

(4) = Sensitivity Evaluation

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(17) = NOT DETECTED - reported a statistically zero result

(28) = Not Reporting Previously Reported Analyte



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

Laboratory Results For MAPEP-21-MaW45  
 (NJDH01) New Jersey Dept. of Health, PHEL, ECLS  
 3 Schwarzkopf Drive  
 West Trenton, NJ 08628

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.426				0.298 - 0.554		
Cesium-134	9.17	10.4	A		-11.8	7.3 - 13.5	0.42	A
Cesium-137	-0.55			A		False Positive Test	0.30	
Cobalt-57	13.1	13.9	A		-5.8	9.7 - 18.1	0.46	A
Cobalt-60	13.9	14.0	A		-0.7	9.8 - 18.2	0.65	A
Hydrogen-3	249.8	250	A		-0.1	175 - 325	7.4	A
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	8.92	9.0	A		-0.9	6.3 - 11.7	0.46	A
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	NR	0.0096				Sensitivity Evaluation		
Plutonium-239/240	NR	0.528				0.370 - 0.686		
Potassium-40	0.1			A		False Positive Test	1.7	
Radium-226	0.175	0.226	W		-22.6	0.158 - 0.294	0.074	N

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	3.64	3.86	A		-5.7	2.70 - 5.02	0.16	A
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	NR	0.0215				Sensitivity Evaluation		
Uranium-238	NR	0.0123				Sensitivity Evaluation		
Zinc-65	-0.34		A			False Positive Test	0.75	

Radiological Reference Date: August 1, 2021

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





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

Laboratory Results For MAPEP-21-MaW45  
 (ODHL01) Ohio Department of Health Laboratory  
 8995 E Main Street  
 Reynoldsburg, OH 43068

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.426				0.298 - 0.554		
Cesium-134	10.3325	10.4	A		-0.6	7.3 - 13.5	0.35775	A
Cesium-137	-0.026775			A		False Positive Test	0.083525	
Cobalt-57	12.775	13.9	A		-8.1	9.7 - 18.1	0.904	A
Cobalt-60	13.875	14.0	A		-0.9	9.8 - 18.2	0.42075	A
Hydrogen-3	230.64	250	A		-7.7	175 - 325	6.79	A
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	8.8675	9.0	A		-1.5	6.3 - 11.7	0.55925	A
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	NR	0.0096				Sensitivity Evaluation		
Plutonium-239/240	NR	0.528				0.370 - 0.686		
Potassium-40	NR		N	(11)		False Positive Test		
Radium-226	NR	0.226				0.158 - 0.294		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	3.86				2.70 - 5.02		
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	NR	0.0215				Sensitivity Evaluation		
Uranium-238	NR	0.0123				Sensitivity Evaluation		
Zinc-65	0.12415		A			False Positive Test	0.19925	

Radiological Reference Date: August 1, 2021

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



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

Laboratory Results For MAPEP-21-MaW45

(ORIS01) ORISE/IEAV

PO Box 117

Oak Ridge, TN 37831-0117

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.393	0.426	A		-7.7	0.298 - 0.554	0.030	A
Cesium-134	10.70	10.4	A		2.9	7.3 - 13.5	0.39	A
Cesium-137	0.009		A			False Positive Test	0.072	
Cobalt-57	14.33	13.9	A		3.1	9.7 - 18.1	0.29	A
Cobalt-60	14.26	14.0	A		1.9	9.8 - 18.2	0.41	A
Hydrogen-3	256	250	A		2.4	175 - 325	11	A
Iron-55	46.3	49.8	A		-7.0	34.9 - 64.7	2.0	A
Manganese-54	9.57	9.0	A		6.3	6.3 - 11.7	0.34	A
Nickel-63	39.7	39.5	A		0.5	27.7 - 51.4	1.1	A
Plutonium-238	0.005	0.0096	A	(17)		Sensitivity Evaluation	0.003	
Plutonium-239/240	0.510	0.528	A		-3.4	0.370 - 0.686	0.038	A
Potassium-40	-0.2		A			False Positive Test	1.0	
Radium-226	0.231	0.226	A		2.2	0.158 - 0.294	0.015	A

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	3.70	3.86	A		-4.1	2.70 - 5.02	0.19	A
Technetium-99	3.81	3.71	A		2.7	2.60 - 4.82	0.25	A
Uranium-234	0.026	0.0215	A			Sensitivity Evaluation	0.007	
Uranium-238	0.009	0.0123	A	(17)		Sensitivity Evaluation	0.004	
Zinc-65	-0.09		A			False Positive Test	0.15	

Radiological Reference Date: August 1, 2021

**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

(2) = False Negative

(4) = Sensitivity Evaluation

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(17) = NOT DETECTED - reported a statistically zero result

(28) = Not Reporting Previously Reported Analyte



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

## Laboratory Results For MAPEP-21-MaW45

(OTLI01) Pace Analytical National Center for Testing &amp; Innovation

12065 Lebanon Road

Mt. Juliet, TN 37122

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	6.9	7.27	A		-5.1	5.09 - 9.45	0.02	N
Arsenic	2.23	2.46	A		-9.4	1.72 - 3.20	0.002	N
Barium	3.02	3.18	A		-5.0	2.23 - 4.13	0.002	N
Beryllium	3.89	4.03	A		-3.5	2.82 - 5.24	0.002	N
Cadmium	0.473	0.468	A		1.1	0.328 - 0.608	0.001	N
Chromium	2.55	2.48	A		2.8	1.74 - 3.22	0.002	N
Cobalt	6.34	6.04	A		5.0	4.23 - 7.85	0.002	N
Copper	8.59	8.29	A		3.6	5.80 - 10.78	0.25	A
Lead	2.86	3.00	A		-4.7	2.10 - 3.90	.002	N
Mercury	NR	0.128				0.090 - 0.166		
Nickel	0.002	0.00102	A	(17)		Sensitivity Evaluation	0.002	
Selenium	0.394	0.411	A		-4.1	0.288 - 0.534	0.002	N
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	2.78	3.06	A		-9.2	2.14 - 3.98	0.002	N
Uranium-235	0.0000006	7.0E-6	A	(17)		Sensitivity Evaluation	0.0001	
Uranium-238	0.00077	9.9E-4	W		-22.2	6.93E-4 - 1.29E-3	0.001	N
Uranium-Total	0.001	1.00E-3	A		0.0	0.00070 - 0.00130	0.001	N
Vanadium	10.3	10.1	A		2.0	7.1 - 13.1	0.025	N
Zinc	8.15	8.42	A		-3.2	5.89 - 10.95	.025	N

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.313	0.426	W		-26.5	0.298 - 0.554	.029	A
Cesium-134	9.55	10.4	A		-8.2	7.3 - 13.5	0.593	A
Cesium-137	-0.030		A			False Positive Test	0.166	
Cobalt-57	13.5	13.9	A		-2.9	9.7 - 18.1	0.906	A
Cobalt-60	14.2	14.0	A		1.4	9.8 - 18.2	0.818	A
Hydrogen-3	266	250	A		6.4	175 - 325	11.9	A
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	10.1	9.0	A		12.2	6.3 - 11.7	0.68	A
Nickel-63	24.8	39.5	N		-37.2	27.7 - 51.4	1.0	A
Plutonium-238	0.009	0.0096	A	(17)		Sensitivity Evaluation	0.009	
Plutonium-239/240	0.363	0.528	N		-31.3	0.370 - 0.686	0.031	A
Potassium-40	0.121		A			False Positive Test	1.11	
Radium-226	NR	0.226				0.158 - 0.294		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	3.60	3.86	A		-6.7	2.70 - 5.02	0.49	A
Technetium-99	3.64	3.71	A		-1.9	2.60 - 4.82	0.32	A
Uranium-234	0.028	0.0215	A	(17)		Sensitivity Evaluation	0.04	
Uranium-238	0.020	0.0123	A	(17)		Sensitivity Evaluation	0.021	
Zinc-65	-0.297		A			False Positive Test	0.386	

Radiological Reference Date: August 1, 2021

**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

(2) = False Negative

(4) = Sensitivity Evaluation

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(17) = NOT DETECTED - reported a statistically zero result

(28) = Not Reporting Previously Reported Analyte



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

Laboratory Results For MAPEP-21-MaW45  
 (QUAN02) Eurofins TestAmerica Knoxville  
 5815 Middlebrook Pike  
 Knoxville, TN 37921-

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	7.87	7.27	A		8.3	5.09 - 9.45	0.26233	A
Arsenic	2.44	2.46	A		-0.8	1.72 - 3.20	0.08540	A
Barium	3.27	3.18	A		2.8	2.23 - 4.13	0.10900	A
Beryllium	4.24	4.03	A		5.2	2.82 - 5.24	0.14133	A
Cadmium	0.49500	0.468	A		5.8	0.328 - 0.608	0.01650	A
Chromium	2.61	2.48	A		5.2	1.74 - 3.22	0.08700	A
Cobalt	6.34	6.04	A		5.0	4.23 - 7.85	0.21133	A
Copper	8.67	8.29	A		4.6	5.80 - 10.78	0.28900	A
Lead	3.25	3.00	A		8.3	2.10 - 3.90	0.108333	A
Mercury	0.13100	0.128	A		2.3	0.090 - 0.166	0.00437	A
Nickel	-0.00440	0.00102	N	(2)		Sensitivity Evaluation	0.0015	
Selenium	0.42500	0.411	A		3.4	0.288 - 0.534	0.01417	A
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	3.29	3.06	A		7.5	2.14 - 3.98	0.10967	A
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	10.5000	10.1	A		4.0	7.1 - 13.1	0.35000	A
Zinc	8.41	8.42	A		-0.1	5.89 - 10.95	0.36443	A

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.426				0.298 - 0.554		
Cesium-134	NR	10.4				7.3 - 13.5		
Cesium-137	NR					False Positive Test		
Cobalt-57	NR	13.9				9.7 - 18.1		
Cobalt-60	NR	14.0				9.8 - 18.2		
Hydrogen-3	NR	250				175 - 325		
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	NR	9.0				6.3 - 11.7		
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	NR	0.0096				Sensitivity Evaluation		
Plutonium-239/240	NR	0.528				0.370 - 0.686		
Potassium-40	NR					False Positive Test		
Radium-226	NR	0.226				0.158 - 0.294		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	3.86				2.70 - 5.02		
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	NR	0.0215				Sensitivity Evaluation		
Uranium-238	NR	0.0123				Sensitivity Evaluation		
Zinc-65	NR					False Positive Test		

Radiological Reference Date: August 1, 2021

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





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

*Laboratory Results For MAPEP-21-MaW45*

(RJLG01) RJ Lee Group - Columbia Basin Analytical Laboratories (CBAL)

2710 North 20th Avenue

Pasco, WA 99301

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	7.71	7.27	A		6.1	5.09 - 9.45	0.728	A
Arsenic	2.57	2.46	A		4.5	1.72 - 3.20	0.218	A
Barium	3.35	3.18	A		5.3	2.23 - 4.13	0.420	A
Beryllium	4.11	4.03	A		2.0	2.82 - 5.24	0.550	A
Cadmium	0.472	0.468	A		0.9	0.328 - 0.608	0.038	A
Chromium	2.51	2.48	A		1.2	1.74 - 3.22	0.236	A
Cobalt	6.04	6.04	A		0.0	4.23 - 7.85	0.719	A
Copper	8.07	8.29	A		-2.7	5.80 - 10.78	0.842	A
Lead	3.05	3.00	A		1.7	2.10 - 3.90	0.272	A
Mercury	0.128	0.128	A		0.0	0.090 - 0.166	0.007	A
Nickel	0.0003	0.00102	N	(4)		Sensitivity Evaluation	0.00003	
Selenium	0.467	0.411	A		13.6	0.288 - 0.534	0.042	A
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	3.16	3.06	A		3.3	2.14 - 3.98	0.213	A
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	0.001	1.00E-3	A		0.0	0.00070 - 0.00130	0.0001	A
Vanadium	10.5	10.1	A		4.0	7.1 - 13.1	1.30	A
Zinc	8.68	8.42	A		3.1	5.89 - 10.95	0.908	A

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.426				0.298 - 0.554		
Cesium-134	NR	10.4				7.3 - 13.5		
Cesium-137	NR					False Positive Test		
Cobalt-57	NR	13.9				9.7 - 18.1		
Cobalt-60	NR	14.0				9.8 - 18.2		
Hydrogen-3	NR	250				175 - 325		
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	NR	9.0				6.3 - 11.7		
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	NR	0.0096				Sensitivity Evaluation		
Plutonium-239/240	NR	0.528				0.370 - 0.686		
Potassium-40	NR					False Positive Test		
Radium-226	NR	0.226				0.158 - 0.294		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	3.86				2.70 - 5.02		
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	NR	0.0215				Sensitivity Evaluation		
Uranium-238	NR	0.0123				Sensitivity Evaluation		
Zinc-65	NR					False Positive Test		

Radiological Reference Date: August 1, 2021

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



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

*Laboratory Results For MAPEP-21-MaW45*

(RPSC01) Radiation Protection Service

Ontario Ministry of Labour, Training And Skills Development

Toronto, Ontario M9P 3T1

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.426				0.298 - 0.554		
Cesium-134	11.4	10.4	A		9.6	7.3 - 13.5	0.744	A
Cesium-137	-0.177			A		False Positive Test	0.349	
Cobalt-57	16.1	13.9	A		15.8	9.7 - 18.1	2.31	A
Cobalt-60	15.5	14.0	A		10.7	9.8 - 18.2	0.933	A
Hydrogen-3	262.77	250	A		5.1	175 - 325	18.75	A
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	10.5	9.0	A		16.7	6.3 - 11.7	1.31	A
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	NR	0.0096				Sensitivity Evaluation		
Plutonium-239/240	NR	0.528				0.370 - 0.686		
Potassium-40	3.01			A		False Positive Test	1.17	
Radium-226	NR	0.226				0.158 - 0.294		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	3.86				2.70 - 5.02		
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	NR	0.0215				Sensitivity Evaluation		
Uranium-238	NR	0.0123				Sensitivity Evaluation		
Zinc-65	NR		N	(11)		False Positive Test		

Radiological Reference Date: August 1, 2021

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



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

*Laboratory Results For MAPEP-21-MaW45*

(SANC99) RadioAnalysis, South Africa Nuclear Energy Corp.

Sample Receipt Gate 1

Pretoria, Gauteng 0001

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.426				0.298 - 0.554		
Cesium-134	9.74	10.4	A		-6.3	7.3 - 13.5	0.48	A
Cesium-137	0.69			A		False Positive Test	0.69	
Cobalt-57	12.52	13.9	A		-9.9	9.7 - 18.1	0.51	A
Cobalt-60	13.15	14.0	A		-6.1	9.8 - 18.2	0.52	A
Hydrogen-3	291	250	A		16.4	175 - 325	14.5	A
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	7.80	9.0	A		-13.3	6.3 - 11.7	0.39	A
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	NR	0.0096				Sensitivity Evaluation		
Plutonium-239/240	NR	0.528				0.370 - 0.686		
Potassium-40	9.95			A		False Positive Test	9.95	
Radium-226	0.228	0.226	A		0.9	0.158 - 0.294	0.033	A

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	3.620	3.86	A		-6.2	2.70 - 5.02	0.500	A
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	0.107	0.0215	N	(4)		Sensitivity Evaluation	0.009	
Uranium-238	0.034	0.0123	N	(4)		Sensitivity Evaluation	0.005	
Zinc-65	1.86		A			False Positive Test	1.86	

Radiological Reference Date: August 1, 2021

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



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

## Laboratory Results For MAPEP-21-MaW45

(SAVA01) SAVANNAH RIVER NUCLEAR SOLUTIONS (SRNS)

SRNL (non-purchased material receipt)

AIKEN, SC 29808-0000

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	7.19	7.27	A		-1.1	5.09 - 9.45	0.72	A
Arsenic	2.42	2.46	A		-1.6	1.72 - 3.20	0.24	A
Barium	3.26	3.18	A		2.5	2.23 - 4.13	0.33	A
Beryllium	3.90	4.03	A		-3.2	2.82 - 5.24	0.39	A
Cadmium	0.474	0.468	A		1.3	0.328 - 0.608	0.047	A
Chromium	2.45	2.48	A		-1.2	1.74 - 3.22	0.25	A
Cobalt	5.65	6.04	A		-6.5	4.23 - 7.85	0.57	A
Copper	7.89	8.29	A		-4.8	5.80 - 10.78	0.79	A
Lead	3.03	3.00	A		1.0	2.10 - 3.90	0.30	A
Mercury	0.161	0.128	W		25.8	0.090 - 0.166	0.016	A
Nickel	0.00422	0.00102	A	(17)		Sensitivity Evaluation	0.0016	
Selenium	0.409	0.411	A		-0.5	0.288 - 0.534	0.041	A
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	2.99	3.06	A		-2.3	2.14 - 3.98	0.30	A
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	0.000945	1.00E-3	A		-5.5	0.00070 - 0.00130	0.000094	A
Vanadium	9.81	10.1	A		-2.9	7.1 - 13.1	0.98	A
Zinc	8.01	8.42	A		-4.9	5.89 - 10.95	0.80	A

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.426				0.298 - 0.554		
Cesium-134	10.4	10.4	A		0.0	7.3 - 13.5	0.593	A
Cesium-137	0.268		A			False Positive Test	0.649	
Cobalt-57	13.4	13.9	A		-3.6	9.7 - 18.1	0.848	A
Cobalt-60	13.9	14.0	A		-0.7	9.8 - 18.2	0.761	A
Hydrogen-3	NR	250				175 - 325		
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	9.22	9.0	A		2.4	6.3 - 11.7	0.968	A
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	NR	0.0096				Sensitivity Evaluation		
Plutonium-239/240	NR	0.528				0.370 - 0.686		
Potassium-40	26.2		A			False Positive Test	65.1	
Radium-226	NR	0.226				0.158 - 0.294		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	3.86				2.70 - 5.02		
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	NR	0.0215				Sensitivity Evaluation		
Uranium-238	NR	0.0123				Sensitivity Evaluation		
Zinc-65	2.37		A			False Positive Test	2.36	

Radiological Reference Date: August 1, 2021

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





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

Laboratory Results For MAPEP-21-MaW45  
 (SEML01) SRS Environmental Monitoring Laboratory  
 Bldg 735-B  
 Aiken, SC 29808

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	7.14	7.27	A		-1.8	5.09 - 9.45	0.86	A
Arsenic	2.26	2.46	A		-8.1	1.72 - 3.20	0.23	A
Barium	3.15	3.18	A		-0.9	2.23 - 4.13	0.28	A
Beryllium	3.80	4.03	A		-5.7	2.82 - 5.24	0.3	A
Cadmium	0.45	0.468	A		-3.8	0.328 - 0.608	0.05	A
Chromium	2.38	2.48	A		-4.0	1.74 - 3.22	0.24	A
Cobalt	5.92	6.04	A		-2.0	4.23 - 7.85	0.53	A
Copper	8.26	8.29	A		-0.4	5.80 - 10.78	0.83	A
Lead	2.86	3.00	A		-4.7	2.10 - 3.90	0.29	A
Mercury	0.135	0.128	A		5.5	0.090 - 0.166	0.0135	A
Nickel	0.1	0.00102	A	(17)		Sensitivity Evaluation	0.1	
Selenium	0.42	0.411	A		2.2	0.288 - 0.534	0.05	A
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	3.01	3.06	A		-1.6	2.14 - 3.98	0.3	A
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	9.85	10.1	A		-2.5	7.1 - 13.1	0.89	A
Zinc	7.95	8.42	A		-5.6	5.89 - 10.95	0.8	A

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.383	0.426	A		-10.1	0.298 - 0.554	0.036	A
Cesium-134	10.96	10.4	A		5.4	7.3 - 13.5	0.65	A
Cesium-137	-0.078		A			False Positive Test	0.074	
Cobalt-57	13.65	13.9	A		-1.8	9.7 - 18.1	0.84	A
Cobalt-60	14.20	14.0	A		1.4	9.8 - 18.2	0.084	N
Hydrogen-3	260	250	A		4.0	175 - 325	20	A
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	9.71	9.0	A		7.9	6.3 - 11.7	0.68	A
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	0.0072	0.0096	A	(17)		Sensitivity Evaluation	0.0030	
Plutonium-239/240	0.442	0.528	A		-16.3	0.370 - 0.686	0.037	A
Potassium-40	-0.03		A			False Positive Test	1.04	
Radium-226	0.232	0.226	A		2.7	0.158 - 0.294	0.040	W

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	3.68	3.86	A		-4.7	2.70 - 5.02	0.27	A
Technetium-99	3.65	3.71	A		-1.6	2.60 - 4.82	0.14	A
Uranium-234	0.0112	0.0215	A	(17)		Sensitivity Evaluation	0.0044	
Uranium-238	0.00618	0.0123	A	(17)		Sensitivity Evaluation	0.00279	
Zinc-65	-0.5		A			False Positive Test	0.2	

Radiological Reference Date: August 1, 2021

**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

(2) = False Negative

(4) = Sensitivity Evaluation

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(17) = NOT DETECTED - reported a statistically zero result

(28) = Not Reporting Previously Reported Analyte



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

Laboratory Results For MAPEP-21-MaW45  
 (SLAC01) SLAC DOE National Accelerator Laboratory  
 2575 Sand Hill Road  
 Menlo Park, CA 94025

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.426				0.298 - 0.554		
Cesium-134	8.29	10.4	W		-20.3	7.3 - 13.5	0.83	A
Cesium-137	0.37		A			False Positive Test	0.37	
Cobalt-57	9.92	13.9	W		-28.6	9.7 - 18.1	0.99	A
Cobalt-60	13.38	14.0	A		-4.4	9.8 - 18.2	1.34	A
Hydrogen-3	245	250	A		-2.0	175 - 325	24	A
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	7.07	9.0	W		-21.4	6.3 - 11.7	0.71	A
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	NR	0.0096				Sensitivity Evaluation		
Plutonium-239/240	NR	0.528				0.370 - 0.686		
Potassium-40	1		A			False Positive Test	1	
Radium-226	NR	0.226				0.158 - 0.294		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	3.86				2.70 - 5.02		
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	NR	0.0215				Sensitivity Evaluation		
Uranium-238	NR	0.0123				Sensitivity Evaluation		
Zinc-65	0.53		A			False Positive Test	0.53	

Radiological Reference Date: August 1, 2021

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



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

*Laboratory Results For MAPEP-21-MaW45*

(SOUT01) Southwest Research Institute

6220 Culebra Rd.

San Antonio, TX 78228-0510

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	7.46	7.27	A		2.6	5.09 - 9.45	1.20	W
Arsenic	2.39	2.46	A		-2.8	1.72 - 3.20	0.399	W
Barium	3.36	3.18	A		5.7	2.23 - 4.13	0.538	W
Beryllium	4.30	4.03	A		6.7	2.82 - 5.24	0.690	W
Cadmium	0.484	0.468	A		3.4	0.328 - 0.608	0.0826	W
Chromium	2.60	2.48	A		4.8	1.74 - 3.22	0.417	W
Cobalt	5.95	6.04	A		-1.5	4.23 - 7.85	0.952	W
Copper	8.62	8.29	A		4.0	5.80 - 10.78	1.38	W
Lead	2.98	3.00	A		-0.7	2.10 - 3.90	0.479	W
Mercury	0.138	0.128	A		7.8	0.090 - 0.166	0.0228	W
Nickel	-0.00265	0.00102	A	(17)		Sensitivity Evaluation	0.0288	
Selenium	0.351	0.411	A		-14.6	0.288 - 0.534	0.154	N
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	3.03	3.06	A		-1.0	2.14 - 3.98	0.498	W
Uranium-235	0.0000067	7.0E-6	A	(17)		Sensitivity Evaluation	0.000005	
Uranium-238	0.000929	9.9E-4	A		-6.2	6.93E-4 - 1.29E-3	0.000156	W
Uranium-Total	0.000934	1.00E-3	A		-6.6	0.00070 - 0.00130	0.000156	W
Vanadium	10.2	10.1	A		1.0	7.1 - 13.1	1.63	W
Zinc	8.49	8.42	A		0.8	5.89 - 10.95	1.36	W

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.485	0.426	A		13.9	0.298 - 0.554	0.0444	A
Cesium-134	9.93	10.4	A		-4.5	7.3 - 13.5	0.493	A
Cesium-137	0.0356		A			False Positive Test	0.202	
Cobalt-57	13.8	13.9	A		-0.7	9.7 - 18.1	0.478	A
Cobalt-60	14.1	14.0	A		0.7	9.8 - 18.2	0.456	A
Hydrogen-3	245	250	A		-2.0	175 - 325	15.4	A
Iron-55	40.0	49.8	A		-19.7	34.9 - 64.7	3.30	A
Manganese-54	9.26	9.0	A		2.9	6.3 - 11.7	0.533	A
Nickel-63	40.4	39.5	A		2.3	27.7 - 51.4	2.37	A
Plutonium-238	0.00711	0.0096	A	(17)		Sensitivity Evaluation	0.00309	
Plutonium-239/240	0.474	0.528	A		-10.2	0.370 - 0.686	0.0374	A
Potassium-40	4.52		A			False Positive Test	1.63	
Radium-226	0.217	0.226	A		-4.0	0.158 - 0.294	0.0187	A

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	3.89	3.86	A		0.8	2.70 - 5.02	0.268	A
Technetium-99	3.43	3.71	A		-7.5	2.60 - 4.82	0.233	A
Uranium-234	0.0259	0.0215	A			Sensitivity Evaluation	0.00522	
Uranium-238	0.0107	0.0123	A			Sensitivity Evaluation	0.00341	
Zinc-65	-0.0158		A			False Positive Test	0.574	

Radiological Reference Date: August 1, 2021

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



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

### Laboratory Results For MAPEP-21-MaW45

(SRPD01) Sandia National Laboratories, Radiation Protection Sample Diagnostics

PO Box 5800, MS1103

Albuquerque, NM 87185-1103

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.426				0.298 - 0.554		
Cesium-134	1.04e+1	10.4	A		0.0	7.3 - 13.5	8.79e-1	A
Cesium-137	2.39e-1			A		False Positive Test	1.64e-1	
Cobalt-57	1.41e+1	13.9	A		1.4	9.7 - 18.1	1.43e+0	A
Cobalt-60	1.33e+1	14.0	A		-5.0	9.8 - 18.2	6.28e-1	A
Hydrogen-3	2.29e+2	250	A		-8.4	175 - 325	1.72e+1	A
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	9.25e+0	9.0	A		2.8	6.3 - 11.7	6.16e-1	A
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	NR	0.0096				Sensitivity Evaluation		
Plutonium-239/240	NR	0.528				0.370 - 0.686		
Potassium-40	3.18e+0			A		False Positive Test	1.25e+0	
Radium-226	NR	0.226				0.158 - 0.294		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	3.86				2.70 - 5.02		
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	NR	0.0215				Sensitivity Evaluation		
Uranium-238	NR	0.0123				Sensitivity Evaluation		
Zinc-65	-2.46e-1		A			False Positive Test	3.41e-1	

Radiological Reference Date: August 1, 2021

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





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

*Laboratory Results For MAPEP-21-MaW45*

(TDHL01) Texas Department of State Health Services Laboratory  
1100 W 49th Street  
Austin, TX 78756

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.338	0.426	W		-20.7	0.298 - 0.554	0.043	A
Cesium-134	8.64	10.4	A		-16.9	7.3 - 13.5	0.18	A
Cesium-137	0.004		A			False Positive Test	0.083	
Cobalt-57	12.37	13.9	A		-11.0	9.7 - 18.1	0.31	A
Cobalt-60	12.38	14.0	A		-11.6	9.8 - 18.2	0.25	A
Hydrogen-3	266	250	A		6.4	175 - 325	13	A
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	8.06	9.0	A		-10.4	6.3 - 11.7	0.23	A
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	0.0132	0.0096	A	(17)		Sensitivity Evaluation	0.0070	
Plutonium-239/240	0.381	0.528	W		-27.8	0.370 - 0.686	0.047	A
Potassium-40	-0.26		A			False Positive Test	0.71	
Radium-226	0.248	0.226	A		9.7	0.158 - 0.294	0.015	A

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	3.53	3.86	A		-8.5	2.70 - 5.02	0.12	A
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	0.065	0.0215	A			Sensitivity Evaluation	0.016	
Uranium-238	0.0130	0.0123	A	(17)		Sensitivity Evaluation	0.0067	
Zinc-65	0.08		A			False Positive Test	0.19	

Radiological Reference Date: August 1, 2021

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



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

*Laboratory Results For MAPEP-21-MaW45*

(TELE01) Teledyne Brown Engineering - Environmental Services

2508 Quality Lane

Knoxville, TN 37931-6819

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.426				0.298 - 0.554		
Cesium-134	NR	10.4				7.3 - 13.5		
Cesium-137	NR					False Positive Test		
Cobalt-57	NR	13.9				9.7 - 18.1		
Cobalt-60	NR	14.0				9.8 - 18.2		
Hydrogen-3	NR	250				175 - 325		
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	NR	9.0				6.3 - 11.7		
Nickel-63	33.5	39.5	A		-15.2	27.7 - 51.4	3.62	A
Plutonium-238	NR	0.0096				Sensitivity Evaluation		
Plutonium-239/240	NR	0.528				0.370 - 0.686		
Potassium-40	NR					False Positive Test		
Radium-226	NR	0.226				0.158 - 0.294		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	3.86				2.70 - 5.02		
Technetium-99	3.5	3.71	A		-5.7	2.60 - 4.82	1.32	N
Uranium-234	NR	0.0215				Sensitivity Evaluation		
Uranium-238	NR	0.0123				Sensitivity Evaluation		
Zinc-65	NR					False Positive Test		

Radiological Reference Date: August 1, 2021

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



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

Laboratory Results For MAPEP-21-MaW45  
 (TELE02) ATI Environmental, Inc., Midwest Lab  
 700 Landwehr Road  
 Northbrook, IL 60062-

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.426				0.298 - 0.554		
Cesium-134	NR	10.4	N	(28)		7.3 - 13.5		
Cesium-137	NR		N	(11)		False Positive Test		
Cobalt-57	NR	13.9	N	(28)		9.7 - 18.1		
Cobalt-60	NR	14.0	N	(28)		9.8 - 18.2		
Hydrogen-3	NR	250				175 - 325		
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	NR	9.0	N	(28)		6.3 - 11.7		
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	NR	0.0096				Sensitivity Evaluation		
Plutonium-239/240	NR	0.528				0.370 - 0.686		
Potassium-40	NR		N	(11)		False Positive Test		
Radium-226	0.32	0.226	N		41.6	0.158 - 0.294	0.06	W

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	3.63	3.86	A		-6.0	2.70 - 5.02	0.16	A
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	0.02	0.0215	A	(17)		Sensitivity Evaluation	0.01	
Uranium-238	0.02	0.0123	A	(17)		Sensitivity Evaluation	0.01	
Zinc-65	NR		N	(11)		False Positive Test		

Radiological Reference Date: August 1, 2021

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



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

Laboratory Results For MAPEP-21-MaW45  
 (TMAO01) EBERLINE Analytical Corporation  
 601 A SCARBORO RD  
 OAK RIDGE, TN 37830-

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.644	0.426	N		51.2	0.298 - 0.554	0.092	A
Cesium-134	9.709	10.4	A		-6.6	7.3 - 13.5	1.038	A
Cesium-137	-0.027		A			False Positive Test	0.750	
Cobalt-57	14.325	13.9	A		3.1	9.7 - 18.1	1.109	A
Cobalt-60	14.114	14.0	A		0.8	9.8 - 18.2	1.409	A
Hydrogen-3	408.758	250	N		63.5	175 - 325	13.691	A
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	9.593	9.0	A		6.6	6.3 - 11.7	1.593	W
Nickel-63	27.509	39.5	N		-30.4	27.7 - 51.4	0.812	A
Plutonium-238	0.003	0.0096	A	(17)		Sensitivity Evaluation	0.033	
Plutonium-239/240	0.695	0.528	N		31.6	0.370 - 0.686	0.132	W
Potassium-40	2.083		A			False Positive Test	5.104	
Radium-226	0.196	0.226	A		-13.3	0.158 - 0.294	0.041	W

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	5.383	3.86	N		39.5	2.70 - 5.02	0.145	A
Technetium-99	5.721	3.71	N		54.2	2.60 - 4.82	0.270	A
Uranium-234	0.293	0.0215	N	(4)		Sensitivity Evaluation	0.050	
Uranium-238	0.242	0.0123	N	(4)		Sensitivity Evaluation	0.050	
Zinc-65	0.060		A			False Positive Test	1.792	

Radiological Reference Date: August 1, 2021

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





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

Laboratory Results For MAPEP-21-MaW45  
 (TNUT01) St. Louis USACE FUSRAP Laboratory  
 112 James S McDonnell Blvd  
 HAZELWOOD, MO 63042

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.481	0.426	A		12.9	0.298 - 0.554	0.057	A
Cesium-134	8.708	10.4	A		-16.3	7.3 - 13.5	.157	N
Cesium-137	-0.016			A		False Positive Test	0.039	
Cobalt-57	14.144	13.9	A		1.8	9.7 - 18.1	.272	N
Cobalt-60	13.852	14.0	A		-1.1	9.8 - 18.2	.27	N
Hydrogen-3	NR	250				175 - 325		
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	9.373	9.0	A		4.1	6.3 - 11.7	.253	A
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	NR	0.0096				Sensitivity Evaluation		
Plutonium-239/240	NR	0.528				0.370 - 0.686		
Potassium-40	4.87			A		False Positive Test	2.04	
Radium-226	.211	0.226	A		-6.6	0.158 - 0.294	0.031	A

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	3.86				2.70 - 5.02		
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	0.01	0.0215	A	(17)		Sensitivity Evaluation	.008	
Uranium-238	0.013	0.0123	A	(17)		Sensitivity Evaluation	0.006	
Zinc-65	-.109		A			False Positive Test	.106	

Radiological Reference Date: August 1, 2021

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



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

*Laboratory Results For MAPEP-21-MaW45*

(UNEV01) University of Nevada, Reno

1664 North Virginia St, MS 328

Reno, NV 89557

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.426				0.298 - 0.554		
Cesium-134	8.931	10.4	A		-14.1	7.3 - 13.5	0.379	A
Cesium-137	NR		N	(11)		False Positive Test		
Cobalt-57	13.645	13.9	A		-1.8	9.7 - 18.1	0.342	A
Cobalt-60	13.210	14.0	A		-5.6	9.8 - 18.2	0.321	A
Hydrogen-3	NR	250				175 - 325		
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	8.663	9.0	A		-3.7	6.3 - 11.7	0.262	A
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	NR	0.0096				Sensitivity Evaluation		
Plutonium-239/240	NR	0.528				0.370 - 0.686		
Potassium-40	NR		N	(11)		False Positive Test		
Radium-226	NR	0.226				0.158 - 0.294		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	3.86				2.70 - 5.02		
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	NR	0.0215				Sensitivity Evaluation		
Uranium-238	NR	0.0123				Sensitivity Evaluation		
Zinc-65	NR		N	(11)		False Positive Test		

Radiological Reference Date: August 1, 2021

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



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

Laboratory Results For MAPEP-21-MaW45

(UNTE01) UniTech-235

178 Aldo Drive

Barnwell, SC 29812

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.426				0.298 - 0.554		
Cesium-134	9.1	10.4	A		-12.5	7.3 - 13.5	0.5	A
Cesium-137	.01			A		False Positive Test	.01	
Cobalt-57	14.5	13.9	A		4.3	9.7 - 18.1	1.2	A
Cobalt-60	13.9	14.0	A		-0.7	9.8 - 18.2	1.1	A
Hydrogen-3	NR	250				175 - 325		
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	9.1	9.0	A		1.1	6.3 - 11.7	1.3	A
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	NR	0.0096				Sensitivity Evaluation		
Plutonium-239/240	NR	0.528				0.370 - 0.686		
Potassium-40	21.8		N	(1)		False Positive Test	6.8	
Radium-226	NR	0.226				0.158 - 0.294		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	3.86				2.70 - 5.02		
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	NR	0.0215				Sensitivity Evaluation		
Uranium-238	NR	0.0123				Sensitivity Evaluation		
Zinc-65	.01		A			False Positive Test	.01	

Radiological Reference Date: August 1, 2021

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



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

Laboratory Results For MAPEP-21-MaW45  
 (WEST04) PACE ANALYTICAL SERVICES, PITTSBURGH  
 1638 Roseytown Road  
 Greensburg, PA 15601

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.426	N	(28)		0.298 - 0.554		
Cesium-134	9.035	10.4	A		-13.1	7.3 - 13.5	0.980	A
Cesium-137	0.043		A			False Positive Test	0.094	
Cobalt-57	14.068	13.9	A		1.2	9.7 - 18.1	1.822	A
Cobalt-60	13.55	14.0	A		-3.2	9.8 - 18.2	1.451	A
Hydrogen-3	244.97	250	A		-2.0	175 - 325	34.89	A
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	9.328	9.0	A		3.6	6.3 - 11.7	1.029	A
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	0.0070	0.0096	A	(17)		Sensitivity Evaluation	0.0048	
Plutonium-239/240	0.3922	0.528	W		-25.7	0.370 - 0.686	0.0614	W
Potassium-40	0.0001		A			False Positive Test	0.543	
Radium-226	0.2269	0.226	A		0.4	0.158 - 0.294	0.064	W

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	3.685	3.86	A		-4.5	2.70 - 5.02	0.5994	W
Technetium-99	NR	3.71	N	(28)		2.60 - 4.82		
Uranium-234	0.0145	0.0215	A	(17)		Sensitivity Evaluation	0.0075	
Uranium-238	0.0174	0.0123	A	(17)		Sensitivity Evaluation	0.0078	
Zinc-65	0.214		A			False Positive Test	0.312	

Radiological Reference Date: August 1, 2021

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





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

Laboratory Results For MAPEP-21-MaW45  
 (WIPH01) WI, DPH, Radiation Protection Section  
 1 West Wilson Street  
 Madison, WI 53701

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.0019	0.426	N		-99.6	0.298 - 0.554	0.5020	N
Cesium-134	9.7031	10.4	A		-6.7	7.3 - 13.5	0.1568	N
Cesium-137	0.1225		A			False Positive Test	0.1018	
Cobalt-57	14.4240	13.9	A		3.8	9.7 - 18.1	0.3105	A
Cobalt-60	13.9407	14.0	A		-0.4	9.8 - 18.2	0.2231	N
Hydrogen-3	NR	250				175 - 325		
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	9.4437	9.0	A		4.9	6.3 - 11.7	0.2731	A
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	NR	0.0096				Sensitivity Evaluation		
Plutonium-239/240	NR	0.528				0.370 - 0.686		
Potassium-40	NR		N	(11)		False Positive Test		
Radium-226	NR	0.226				0.158 - 0.294		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	3.86				2.70 - 5.02		
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	NR	0.0215				Sensitivity Evaluation		
Uranium-238	NR	0.0123				Sensitivity Evaluation		
Zinc-65	0.0352		A			False Positive Test	0.1952	

Radiological Reference Date: August 1, 2021

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



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

*Laboratory Results For MAPEP-21-MaW45*

(WIPP01) WIPP Laboratories

1400 University Drive

Carlsbad, NM 88220

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	4.07E-01	0.426	A		-4.5	0.298 - 0.554	7.45E-02	W
Cesium-134	7.01E+00	10.4	N		-32.6	7.3 - 13.5	1.63E-01	A
Cesium-137	1.30E-02		A			False Positive Test	5.29E-02	
Cobalt-57	1.03E+01	13.9	W		-25.9	9.7 - 18.1	2.51E-01	A
Cobalt-60	1.02E+01	14.0	W		-27.1	9.8 - 18.2	2.27E-01	A
Hydrogen-3	NR	250				175 - 325		
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	6.66E+00	9.0	W		-26.0	6.3 - 11.7	1.80E-01	A
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	4.99E-03	0.0096	A	(17)		Sensitivity Evaluation	3.69E-03	
Plutonium-239/240	4.84E-01	0.528	A		-8.3	0.370 - 0.686	8.71E-02	W
Potassium-40	6.13E-01		A			False Positive Test	9.43E-01	
Radium-226	NR	0.226				0.158 - 0.294		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	3.82E+00	3.86	A		-1.0	2.70 - 5.02	2.22E-01	A
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	2.81E-02	0.0215	A			Sensitivity Evaluation	7.63E-03	
Uranium-238	2.26E-02	0.0123	A			Sensitivity Evaluation	6.81E-03	
Zinc-65	-3.59E-02		A			False Positive Test	1.35E-01	

Radiological Reference Date: August 1, 2021

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



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

Laboratory Results For MAPEP-21-MaW45  
 (WSHL01) Wisconsin State Laboratory of Hygiene  
 2601 Agriculture Drive  
 Madison, WI 53718

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.426				0.298 - 0.554		
Cesium-134	10.4	10.4	A		0.0	7.3 - 13.5	0.217	A
Cesium-137	0.0804			A		False Positive Test	0.0816	
Cobalt-57	14.7	13.9	A		5.8	9.7 - 18.1	0.381	A
Cobalt-60	13.9	14.0	A		-0.7	9.8 - 18.2	0.784	A
Hydrogen-3	NR	250				175 - 325		
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	9.3	9.0	A		3.3	6.3 - 11.7	0.435	A
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	NR	0.0096				Sensitivity Evaluation		
Plutonium-239/240	NR	0.528				0.370 - 0.686		
Potassium-40	0.597			A		False Positive Test	0.743	
Radium-226	NR	0.226				0.158 - 0.294		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	3.86	N	(28)		2.70 - 5.02		
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	NR	0.0215				Sensitivity Evaluation		
Uranium-238	NR	0.0123				Sensitivity Evaluation		
Zinc-65	0.0655		A			False Positive Test	0.225	

Radiological Reference Date: August 1, 2021

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



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

Laboratory Results For MAPEP-21-MaW45  
 (WVDP01) WVDP Environmental Laboratory  
 10282 Rock Springs Road  
 West Valley, NY 14171

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	NR	7.0E-6				Sensitivity Evaluation		
Uranium-238	NR	9.9E-4				6.93E-4 - 1.29E-3		
Uranium-Total	NR	1.00E-3				0.00070 - 0.00130		
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.426				0.298 - 0.554		
Cesium-134	9.14	10.4	A		-12.1	7.3 - 13.5	0.261	A
Cesium-137	-0.00944			A		False Positive Test	0.0770	
Cobalt-57	13.5	13.9	A		-2.9	9.7 - 18.1	0.378	A
Cobalt-60	13.8	14.0	A		-1.4	9.8 - 18.2	0.348	A
Hydrogen-3	NR	250				175 - 325		
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	8.73	9.0	A		-3.0	6.3 - 11.7	0.303	A
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	NR	0.0096				Sensitivity Evaluation		
Plutonium-239/240	NR	0.528				0.370 - 0.686		
Potassium-40	-0.434			A		False Positive Test	1.18	
Radium-226	NR	0.226				0.158 - 0.294		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	3.75	3.86	A		-2.9	2.70 - 5.02	0.167	A
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	NR	0.0215				Sensitivity Evaluation		
Uranium-238	NR	0.0123				Sensitivity Evaluation		
Zinc-65	-0.0390		A			False Positive Test	0.205	

Radiological Reference Date: August 1, 2021

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





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

*Laboratory Results For MAPEP-21-MaW45*

(YPGA01) US Army Yuma Proving Ground / Material Analysis Lab

301 C. Street

Yuma, AZ 85365

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	7.27				5.09 - 9.45		
Arsenic	NR	2.46				1.72 - 3.20		
Barium	NR	3.18				2.23 - 4.13		
Beryllium	NR	4.03				2.82 - 5.24		
Cadmium	NR	0.468				0.328 - 0.608		
Chromium	NR	2.48				1.74 - 3.22		
Cobalt	NR	6.04				4.23 - 7.85		
Copper	NR	8.29				5.80 - 10.78		
Lead	NR	3.00				2.10 - 3.90		
Mercury	NR	0.128				0.090 - 0.166		
Nickel	NR	0.00102				Sensitivity Evaluation		
Selenium	NR	0.411				0.288 - 0.534		
Technetium-99	NR	5.87E-6				4.11E-6 - 7.63E-6		
Thallium	NR	3.06				2.14 - 3.98		
Uranium-235	0.00001	7.0E-6	A	(17)		Sensitivity Evaluation	0.00001	
Uranium-238	0.0011	9.9E-4	A		11.1	6.93E-4 - 1.29E-3	0.0006	N
Uranium-Total	0.0011	1.00E-3	A		10.0	0.00070 - 0.00130	0.0006	N
Vanadium	NR	10.1				7.1 - 13.1		
Zinc	NR	8.42				5.89 - 10.95		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.426				0.298 - 0.554		
Cesium-134	NR	10.4				7.3 - 13.5		
Cesium-137	NR					False Positive Test		
Cobalt-57	NR	13.9				9.7 - 18.1		
Cobalt-60	NR	14.0				9.8 - 18.2		
Hydrogen-3	NR	250				175 - 325		
Iron-55	NR	49.8				34.9 - 64.7		
Manganese-54	NR	9.0				6.3 - 11.7		
Nickel-63	NR	39.5				27.7 - 51.4		
Plutonium-238	NR	0.0096				Sensitivity Evaluation		
Plutonium-239/240	NR	0.528				0.370 - 0.686		
Potassium-40	NR					False Positive Test		
Radium-226	NR	0.226				0.158 - 0.294		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	3.86				2.70 - 5.02		
Technetium-99	NR	3.71				2.60 - 4.82		
Uranium-234	NR	0.0215				Sensitivity Evaluation		
Uranium-238	NR	0.0123				Sensitivity Evaluation		
Zinc-65	NR					False Positive Test		

Radiological Reference Date: August 1, 2021

**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:**

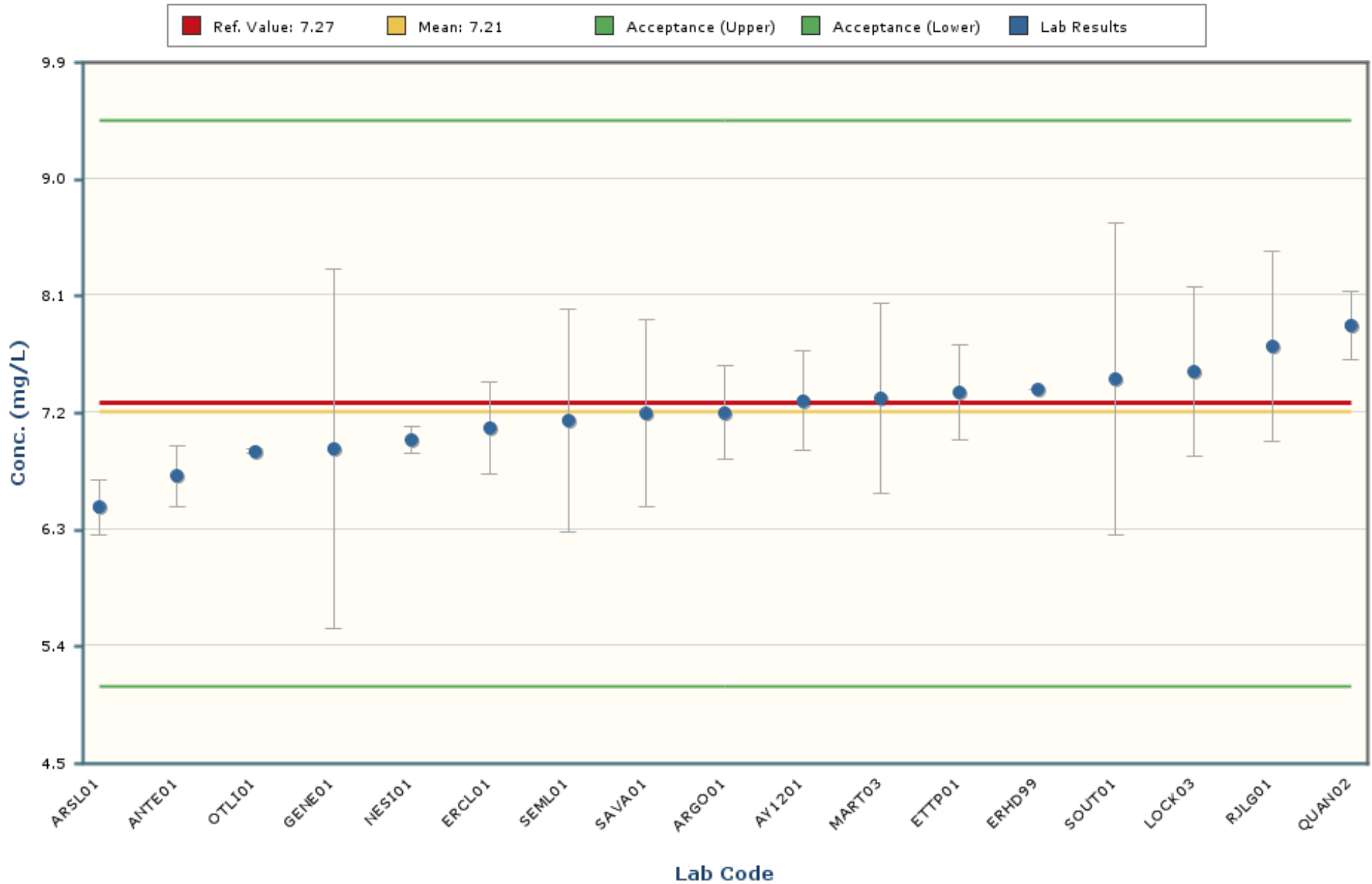
- NOT ACCEPTABLE.....RP < 2%
  - ACCEPTABLE.....2% <= RP <= 15%
  - ACCEPTABLE WITH WARNING.....15% < RP <= 30%
  - NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

**Notes:**

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

# Antimony

## MAPEP-21-MaW45



### Notes:

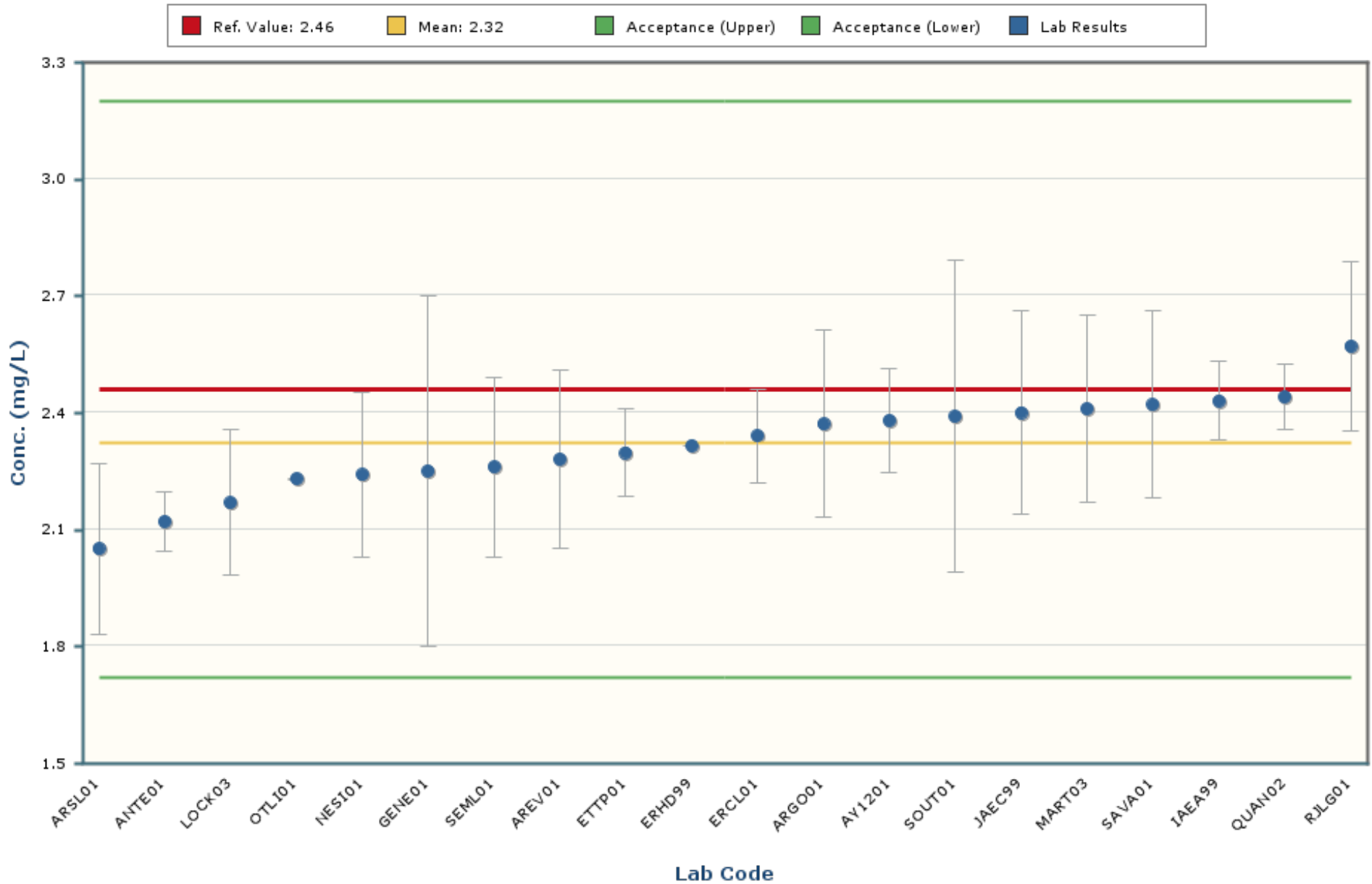
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 5.46 and 8.95 ( $\pm 5$  Standard Deviations).

The error bars encompassing each result are plotted at  $\pm$  one standard deviation.

# Arsenic

## MAPEP-21-MaW45



### Notes:

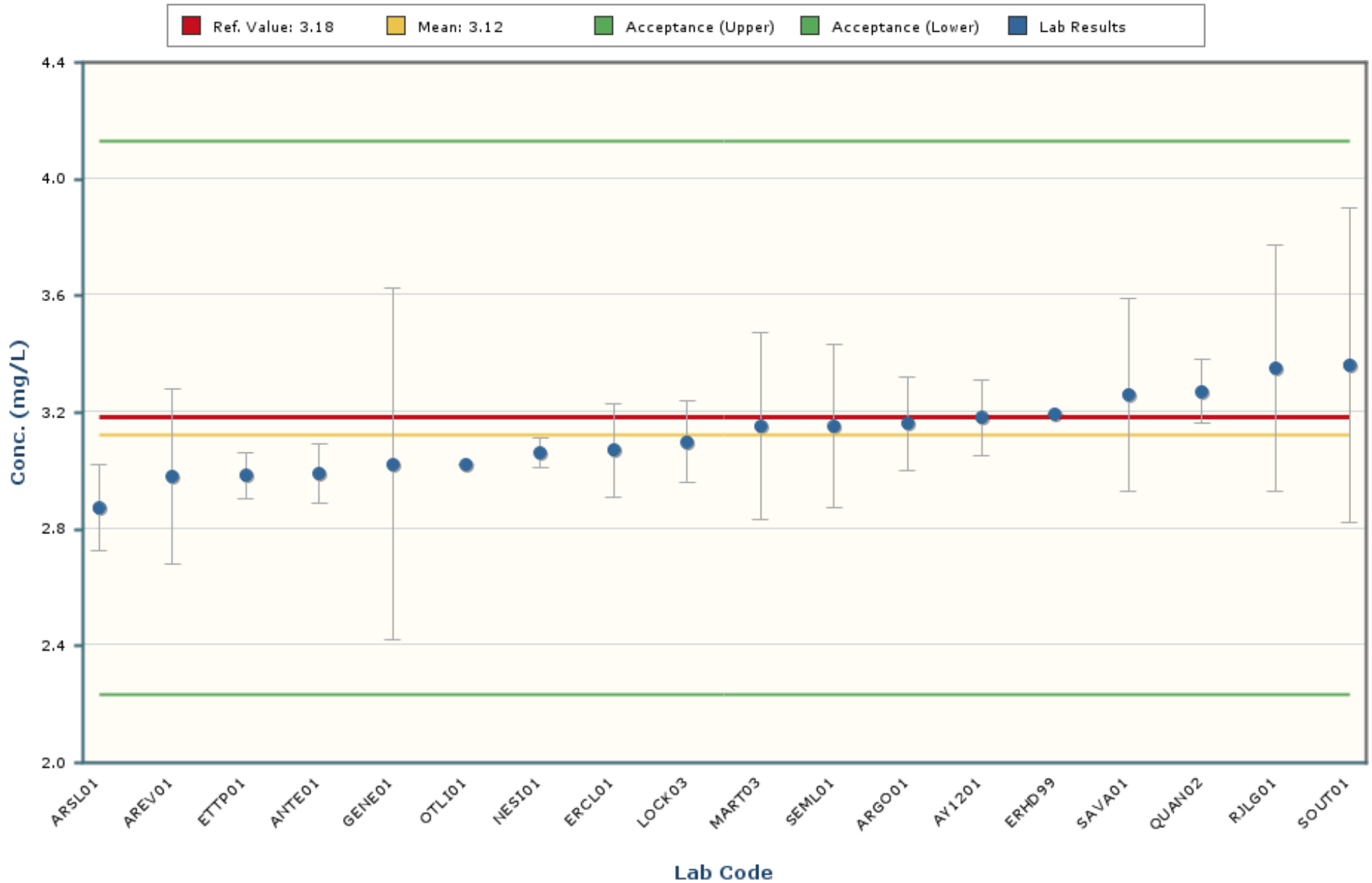
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 1.70 and 2.93 ( $\pm 5$  Standard Deviations).

The error bars encompassing each result are plotted at  $\pm$  one standard deviation.

# Barium

MAPEP-21-MaW45



## Notes:

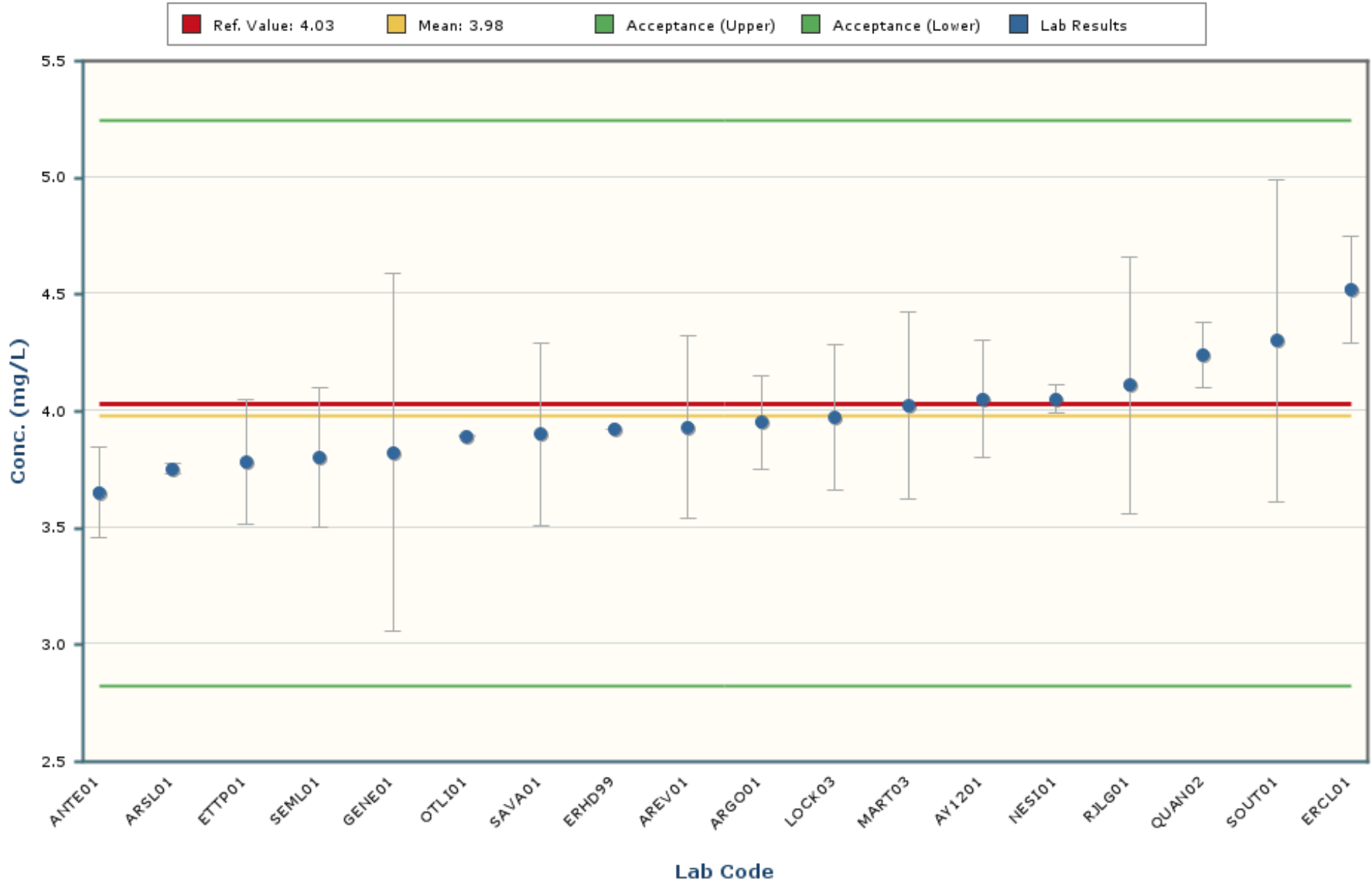
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 2.45 and 3.79 ( $\pm 5$  Standard Deviations).

The error bars encompassing each result are plotted at  $\pm$  one standard deviation.

# Beryllium

MAPEP-21-MaW45



## Notes:

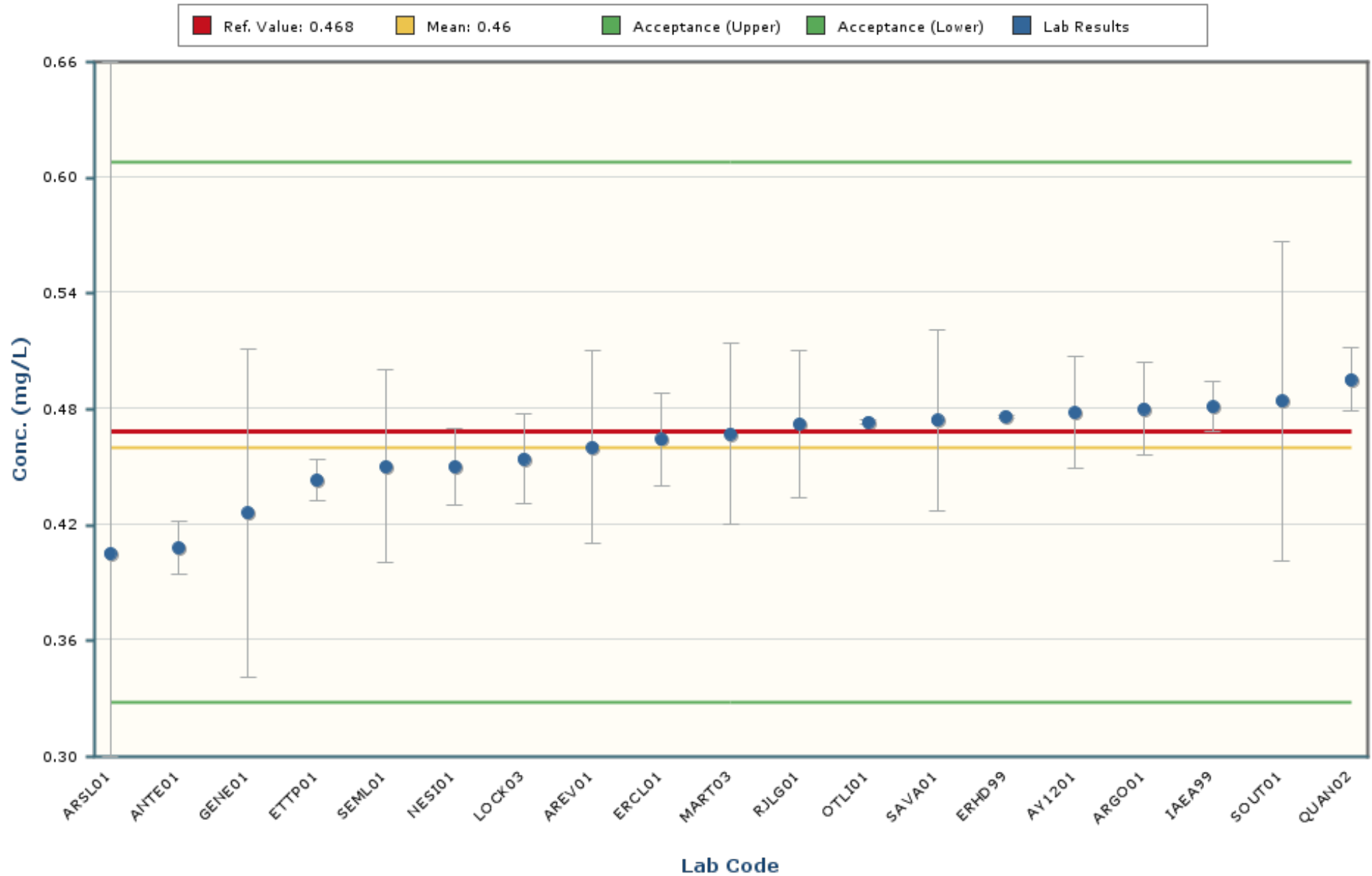
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 2.92 and 5.05 ( $\pm 5$  Standard Deviations).

The error bars encompassing each result are plotted at  $\pm$  one standard deviation.

# Cadmium

MAPEP-21-MaW45



## Notes:

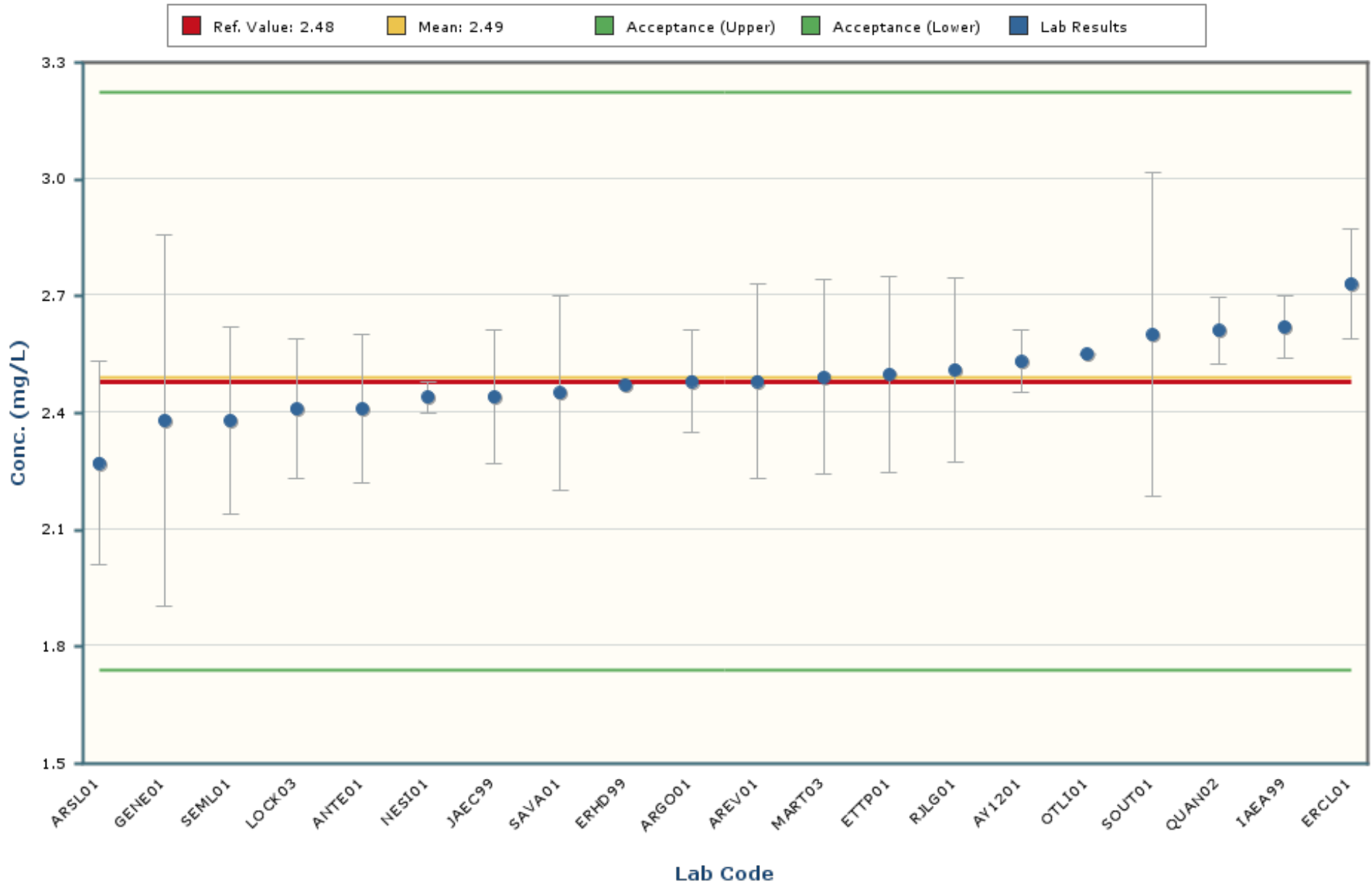
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 0.335 and 0.585 ( $\pm 5$  Standard Deviations).

The error bars encompassing each result are plotted at  $\pm 1$  standard deviation.

# Chromium

## MAPEP-21-MaW45



### Notes:

The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

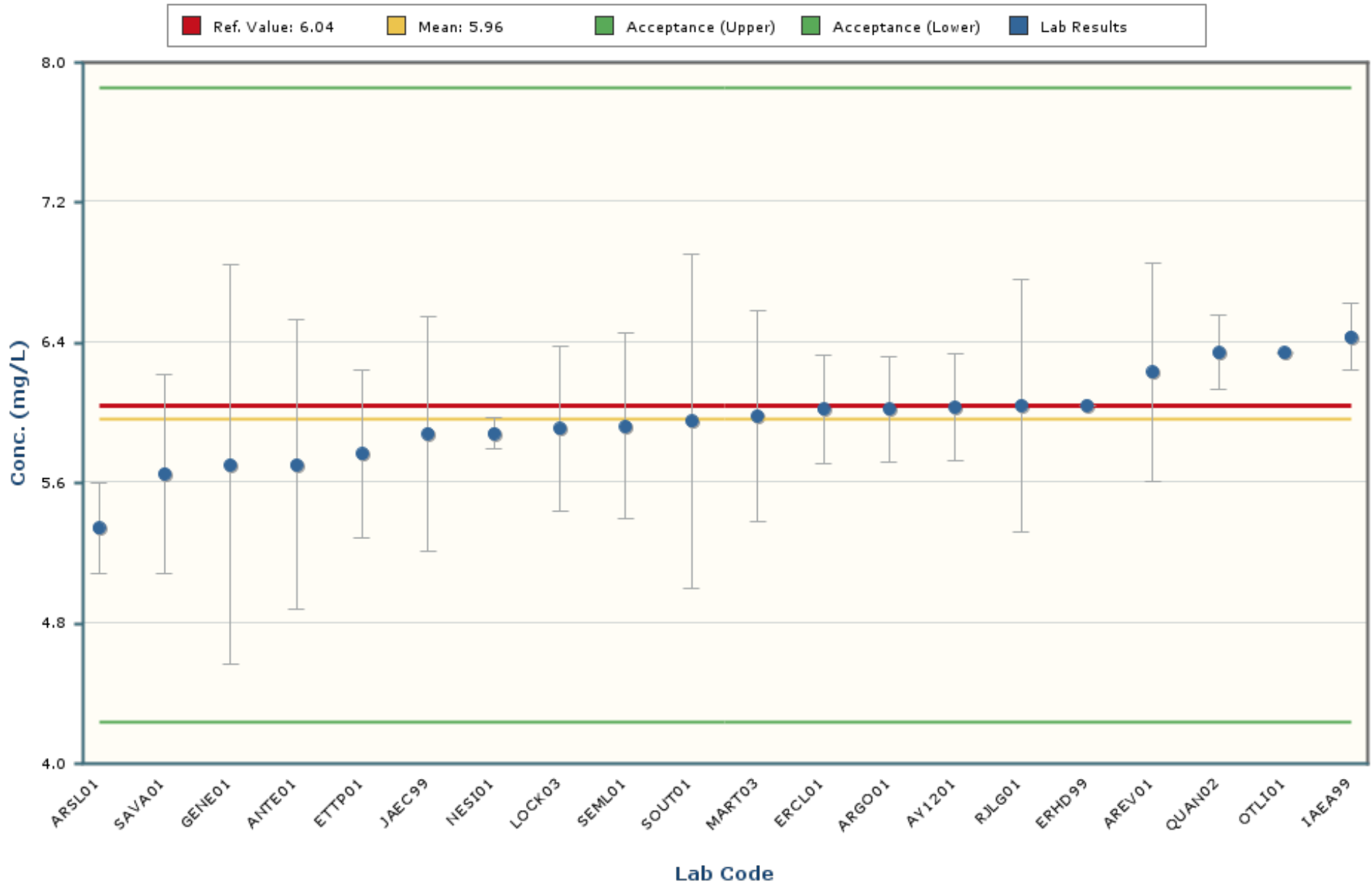
The chart shows only data points with values between 1.98 and 3.00 ( $\pm 5$  Standard Deviations).

The error bars encompassing each result are plotted at  $\pm 1$  standard deviation.



# Cobalt

## MAPEP-21-MaW45



### Notes:

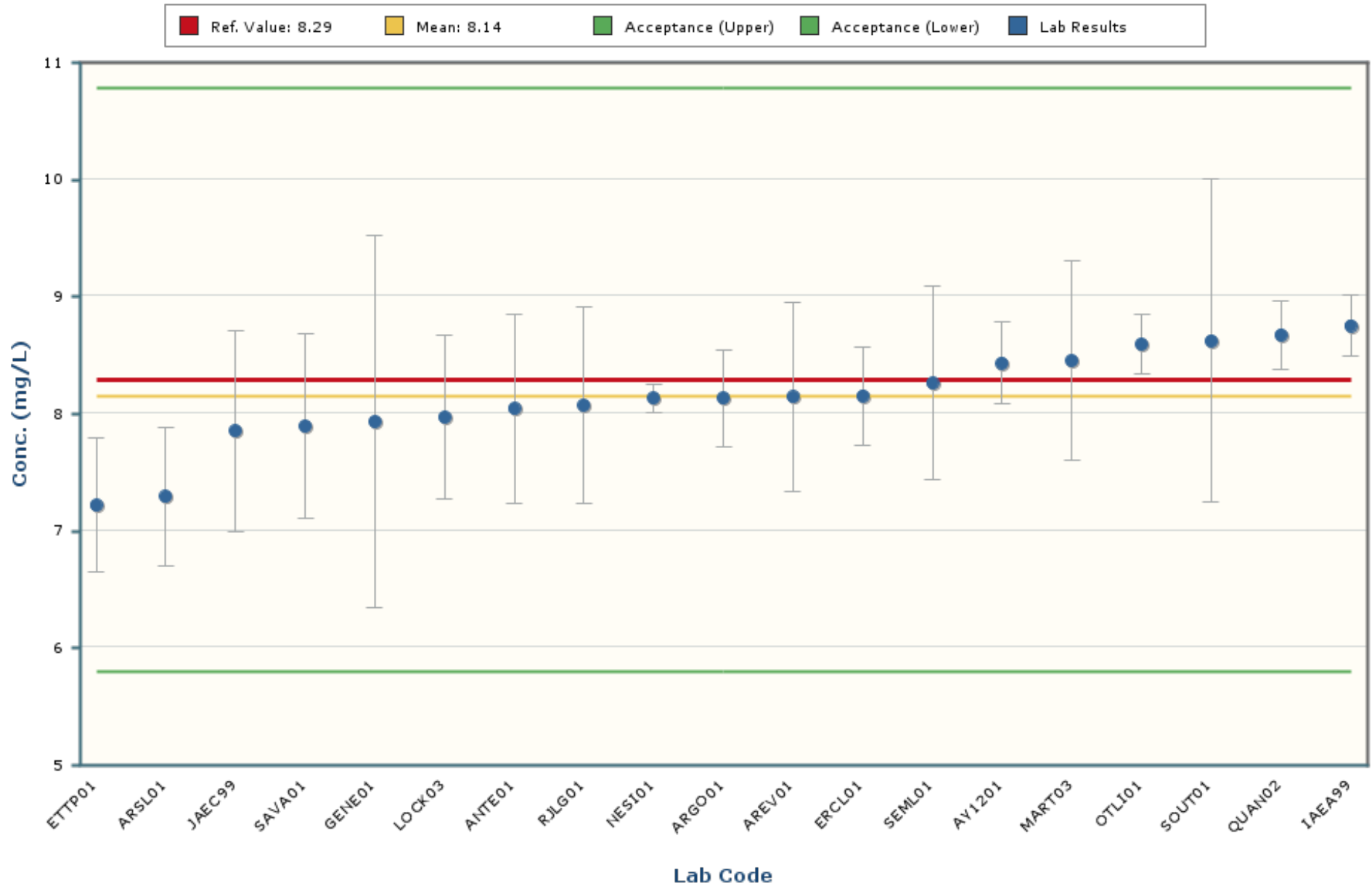
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 4.66 and 7.26 ( $\pm 5$  Standard Deviations).

The error bars encompassing each result are plotted at  $\pm 1$  standard deviation.

# Copper

## MAPEP-21-MaW45



### Notes:

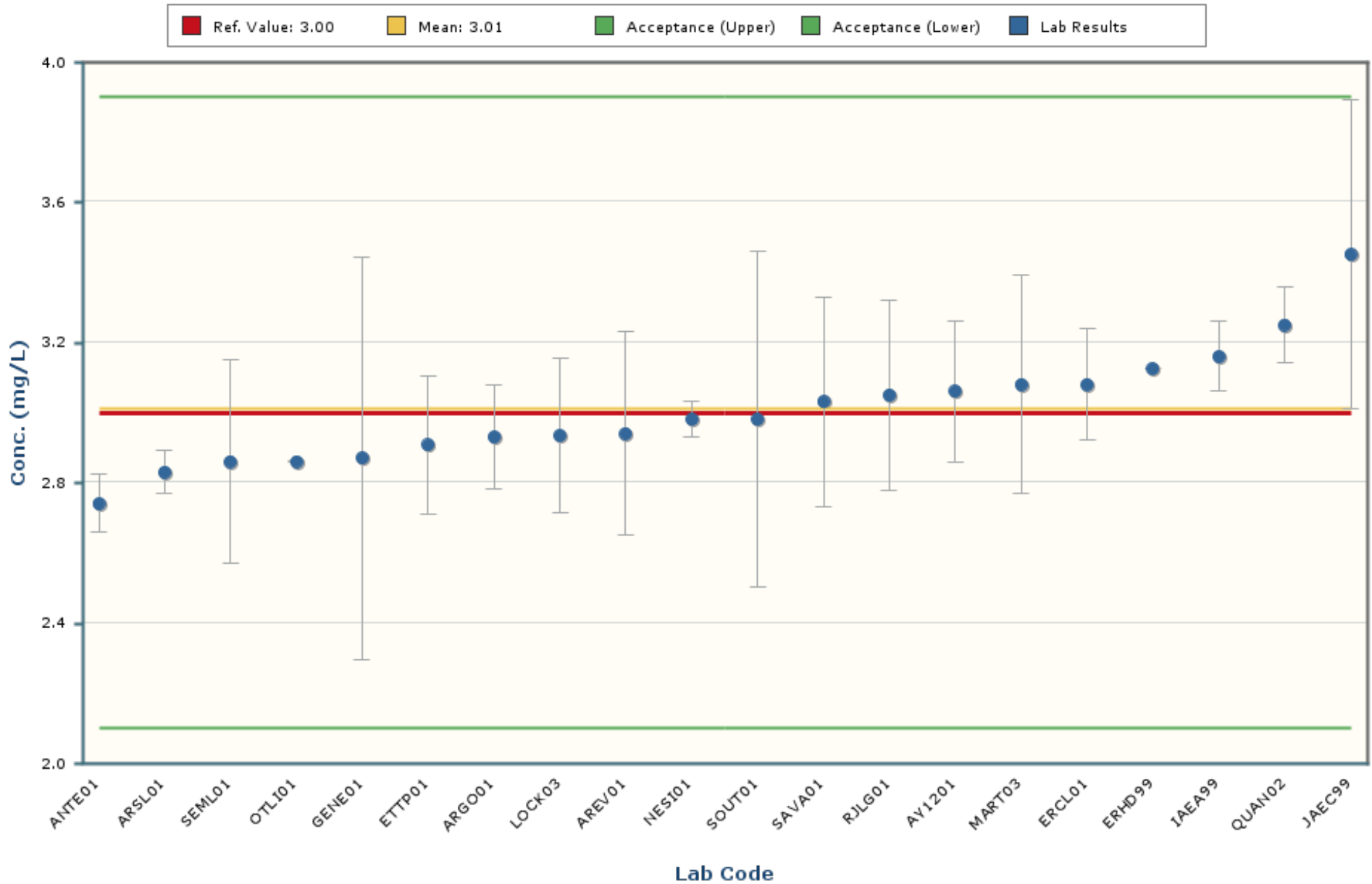
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 6.06 and 10.21 ( $\pm 5$  Standard Deviations).

The error bars encompassing each result are plotted at  $\pm 1$  standard deviation.

# Lead

## MAPEP-21-MaW45



### Notes:

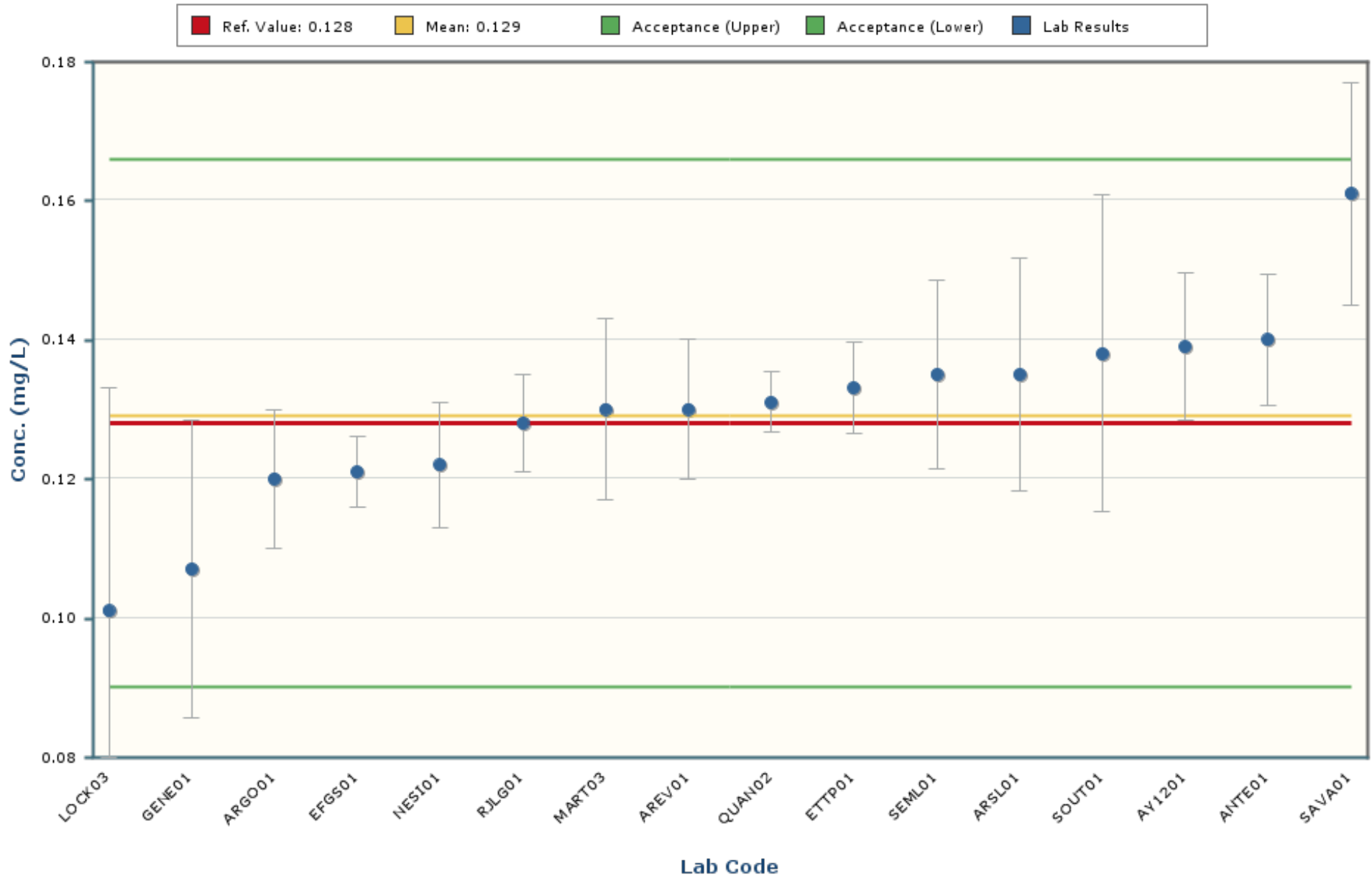
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 2.19 and 3.82 ( $\pm 5$  Standard Deviations).

The error bars encompassing each result are plotted at  $\pm 1$  standard deviation.

# Mercury

## MAPEP-21-MaW45



### Notes:

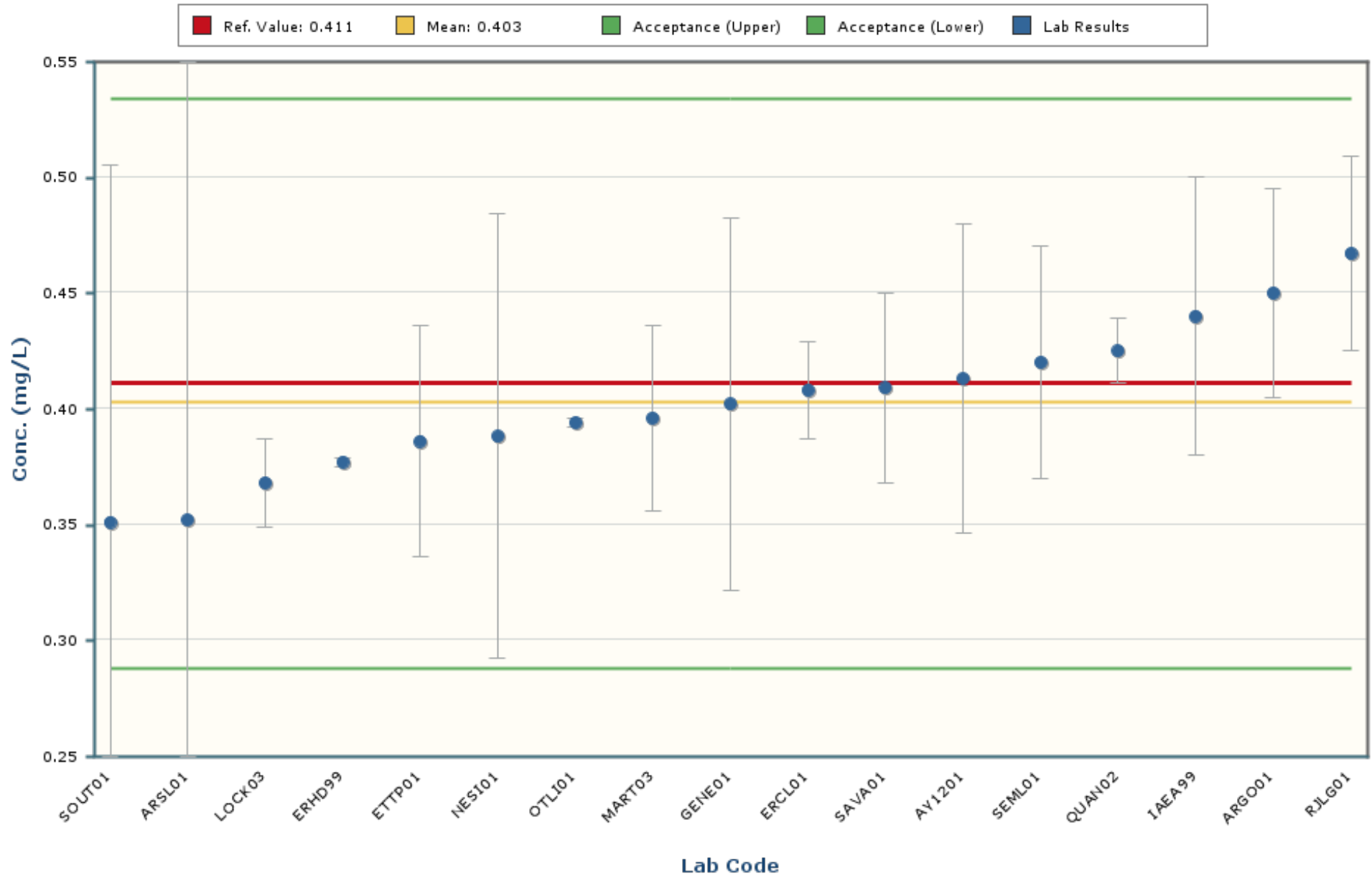
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 0.060 and 0.199 ( $\pm 5$  Standard Deviations).

The error bars encompassing each result are plotted at  $\pm$  one standard deviation.

# Selenium

## MAPEP-21-MaW45



### Notes:

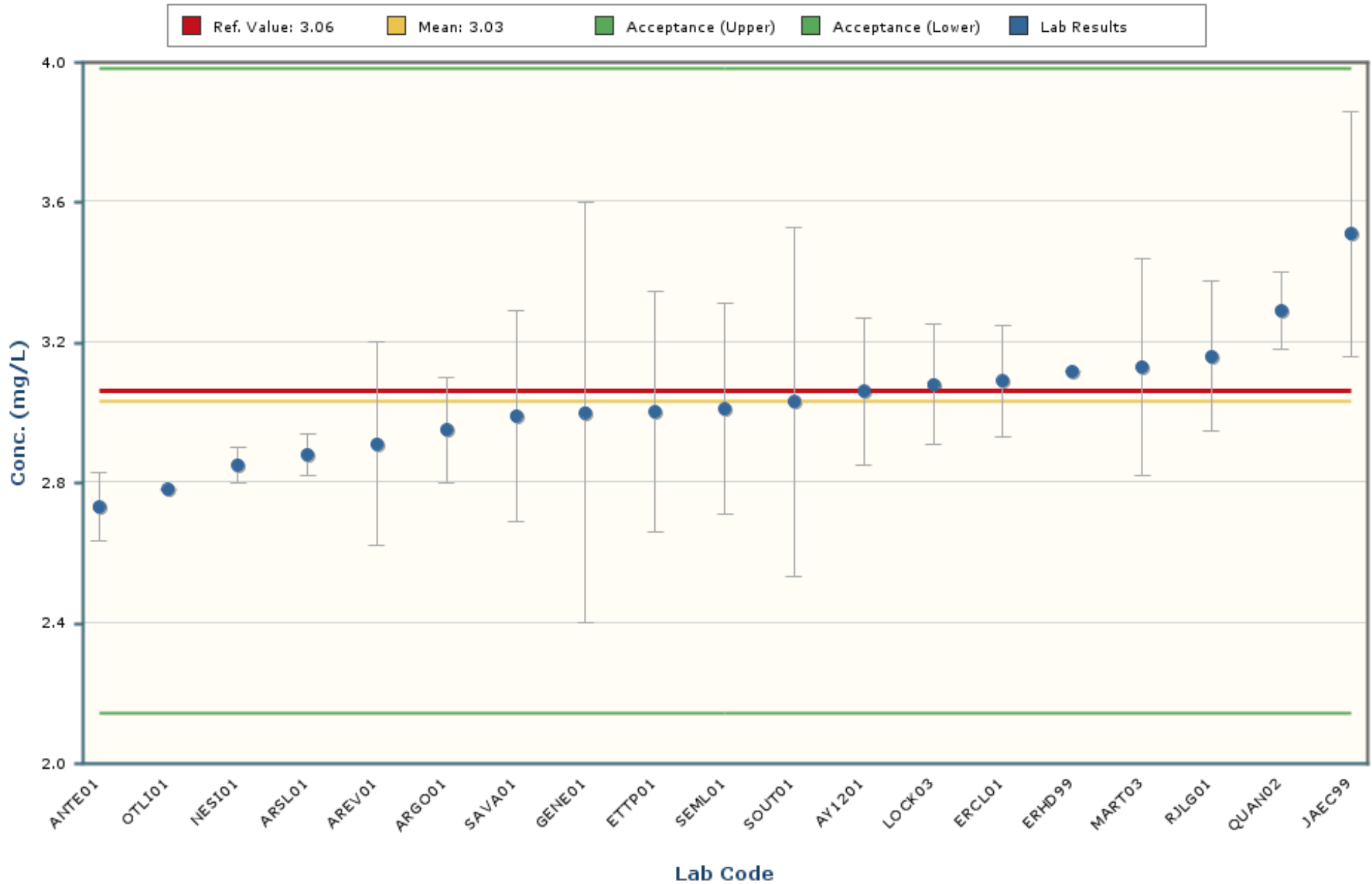
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 0.242 and 0.563 ( $\pm 5$  Standard Deviations).

The error bars encompassing each result are plotted at  $\pm 1$  standard deviation.

# Thallium

## MAPEP-21-MaW45



### Notes:

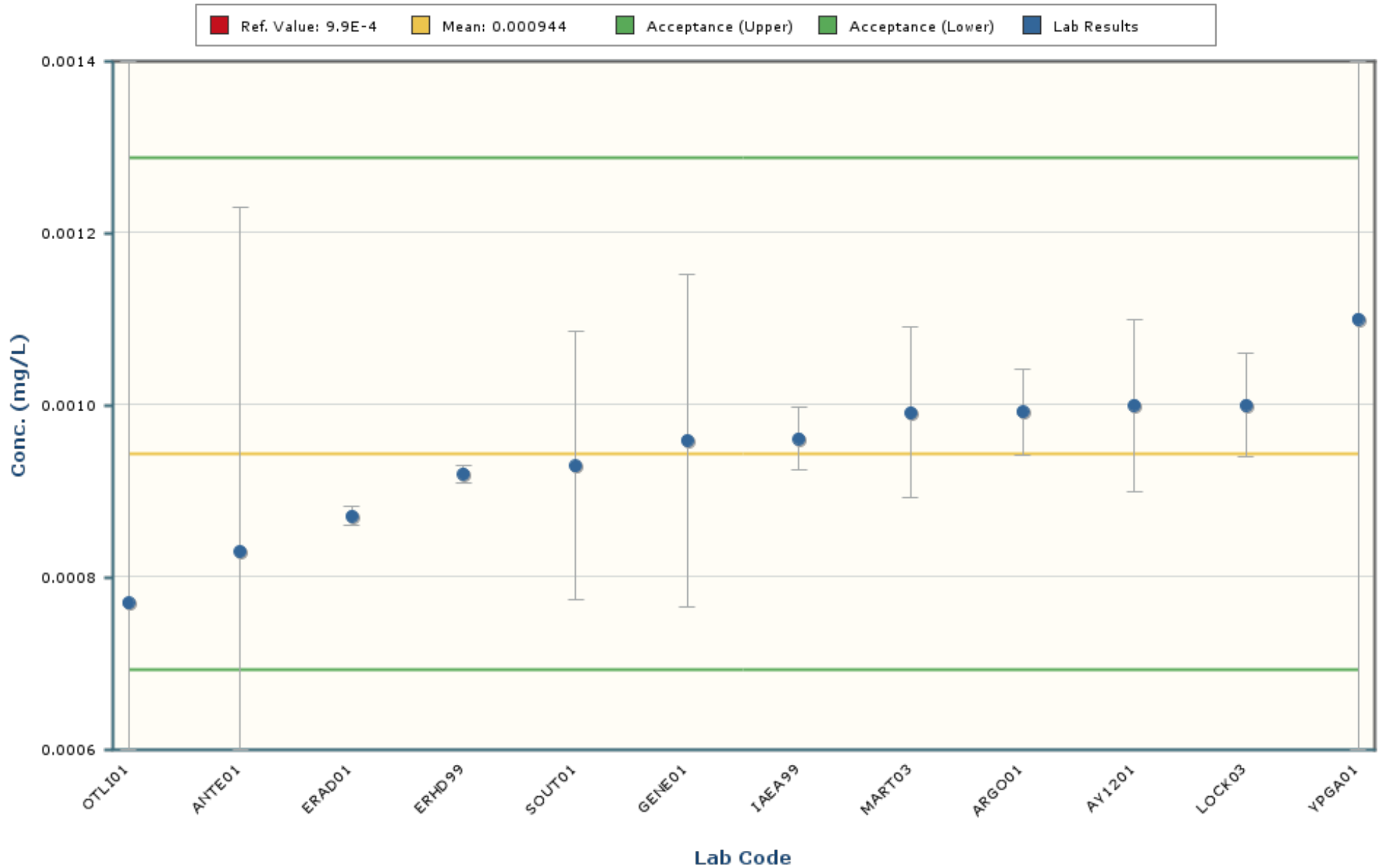
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 2.14 and 3.92 ( $\pm 5$  Standard Deviations).

The error bars encompassing each result are plotted at  $\pm 1$  standard deviation.

# Uranium-238

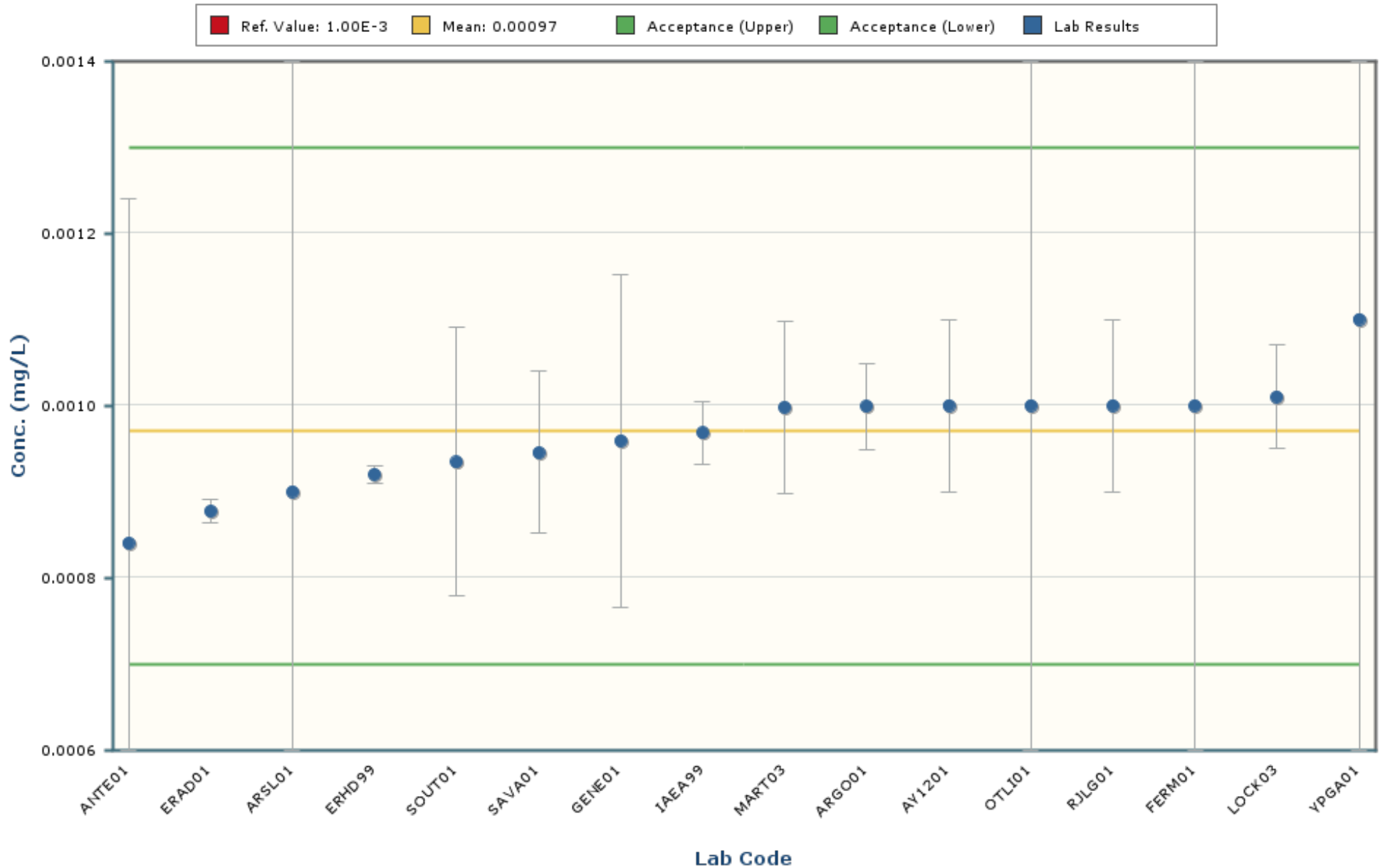
## MAPEP-21-MaW45



Notes:  
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .  
The chart shows only data points with values between 0.000504 and 0.001383 ( $\pm 5$  Standard Deviations).  
The error bars encompassing each result are plotted at  $\pm 1$  standard deviation.

# Uranium-Total

## MAPEP-21-MaW45

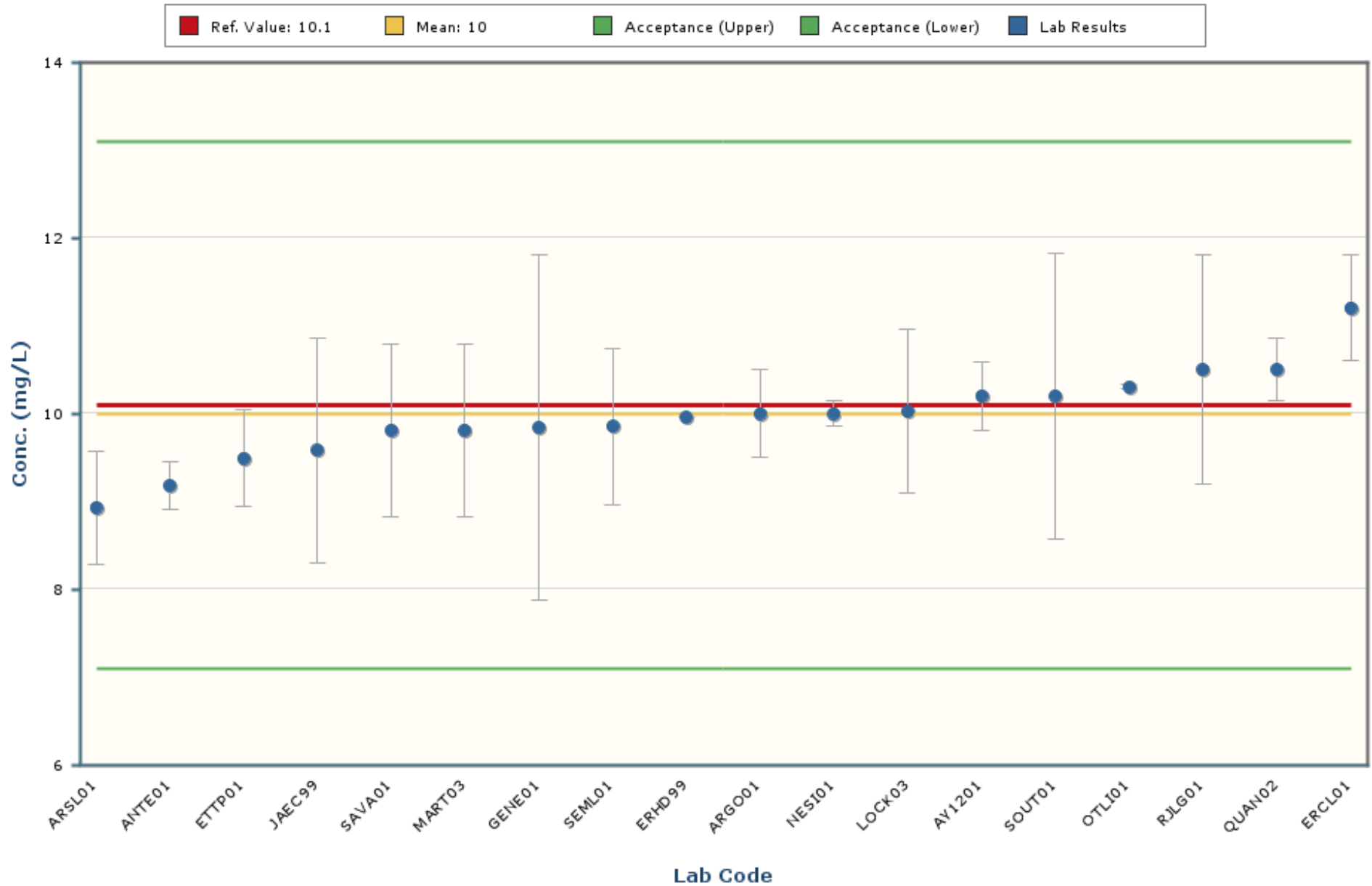


Notes:  
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .  
The chart shows only data points with values between 0.00065 and 0.00128 ( $\pm 5$  Standard Deviations).  
The error bars encompassing each result are plotted at  $\pm$  one standard deviation.



# Vanadium

MAPEP-21-MaW45



## Notes:

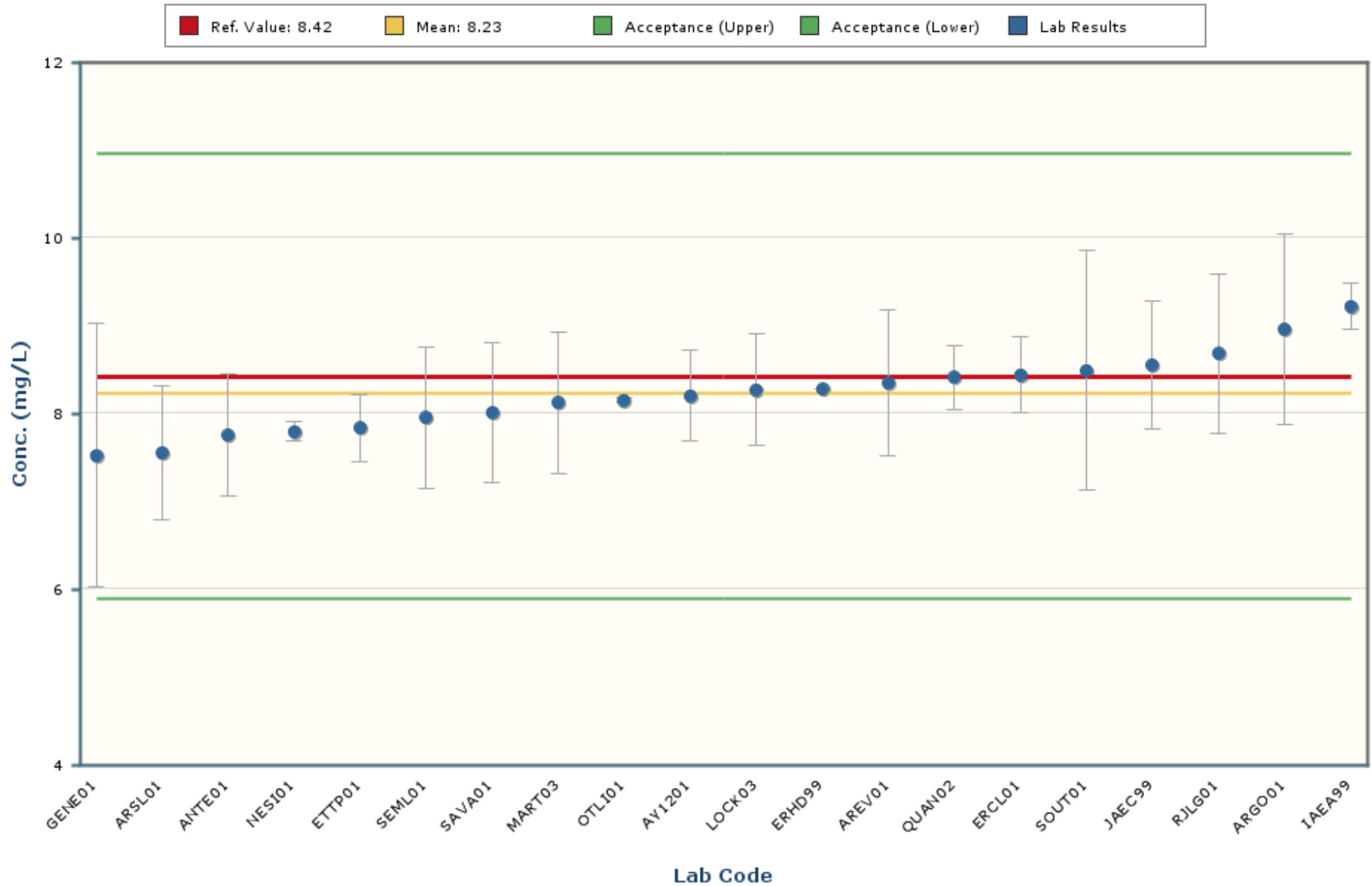
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 7.4 and 12.5 ( $\pm 5$  Standard Deviations).

The error bars encompassing each result are plotted at  $\pm$  one standard deviation.

# Zinc

## MAPEP-21-MaW45



### Notes:

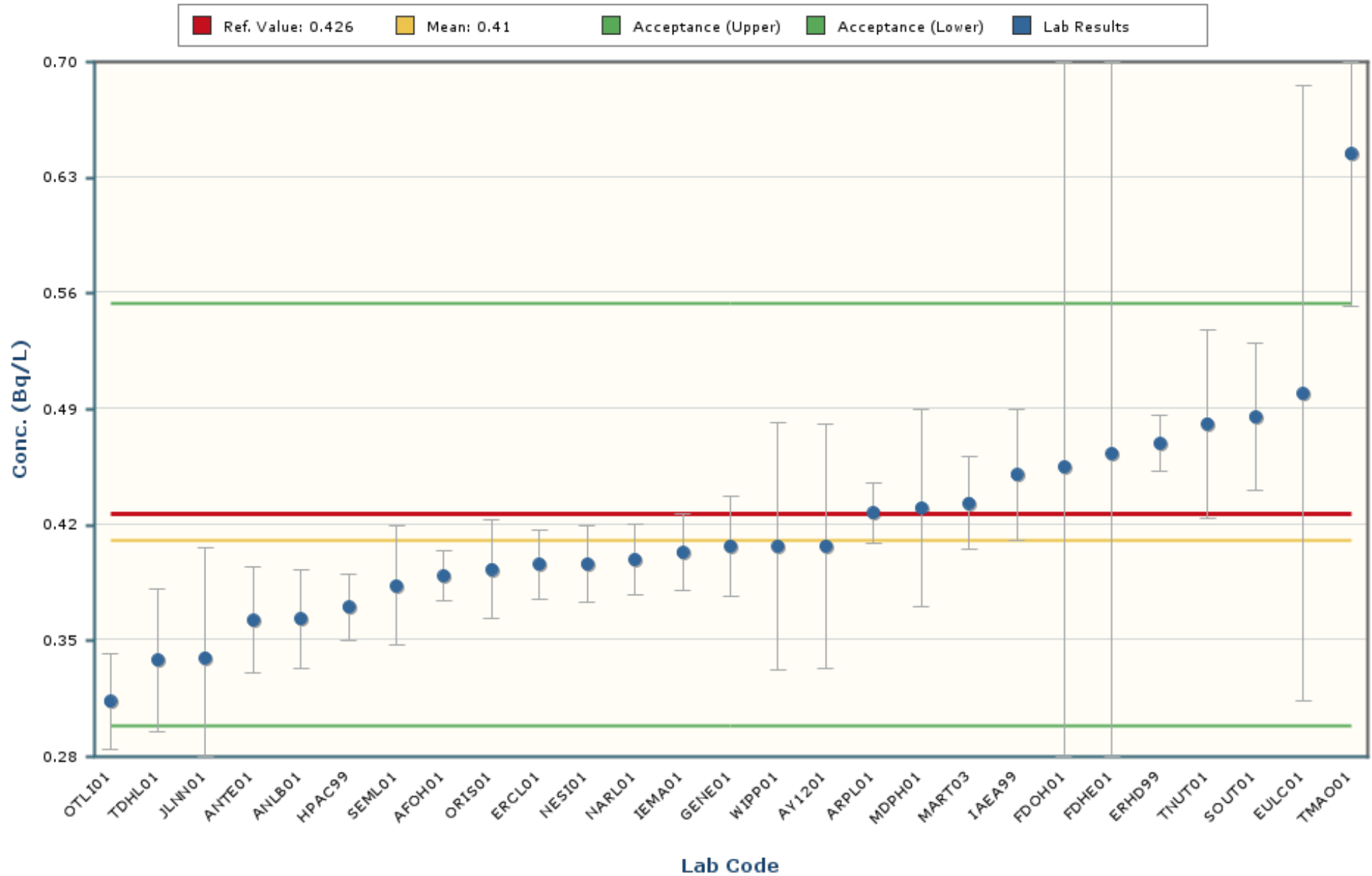
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 6.03 and 10.42 ( $\pm 5$  Standard Deviations).

The error bars encompassing each result are plotted at  $\pm 1$  standard deviation.

# Americium-241

## MAPEP-21-MaW45



### Notes:

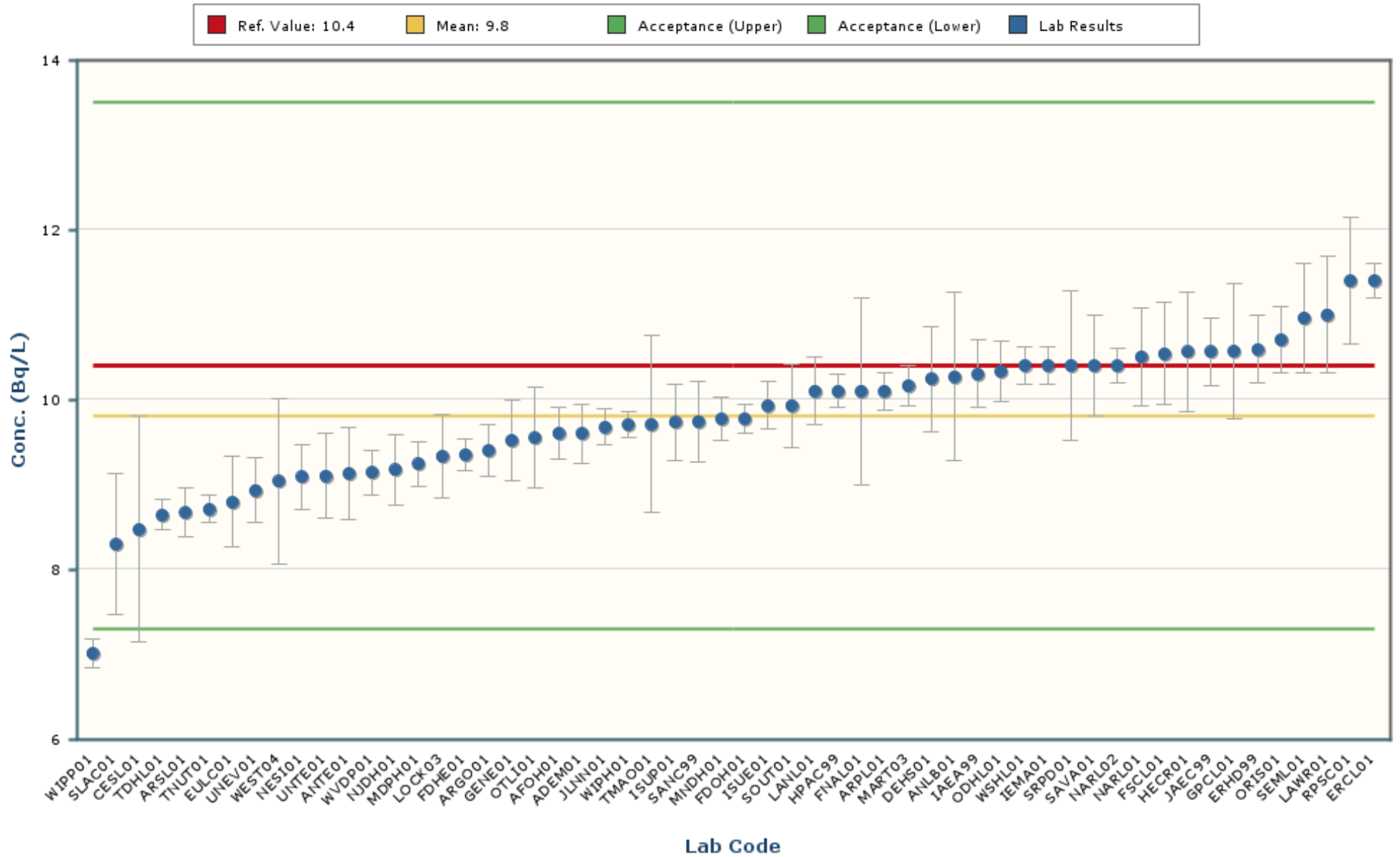
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 0.170 and 0.650 ( $\pm 5$  Standard Deviations).

The error bars encompassing each result are plotted at  $\pm 1$  standard deviation.

# Cesium-134

MAPEP-21-MaW45



## Notes:

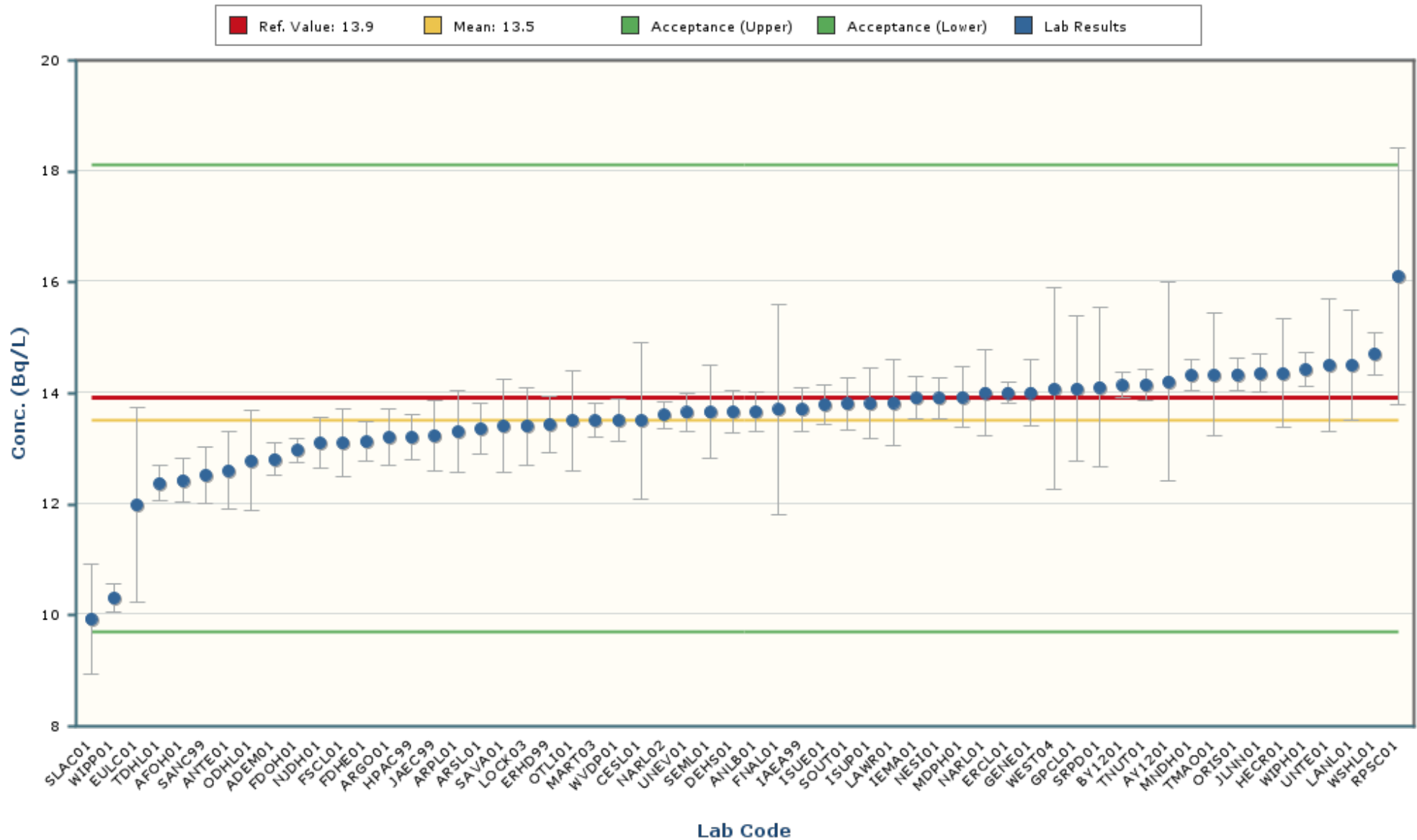
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 6.2 and 13.5 ( $\pm 5$  Standard Deviations).

The error bars encompassing each result are plotted at  $\pm$  one standard deviation.

# Cobalt-57

## MAPEP-21-MaW45



### Notes:

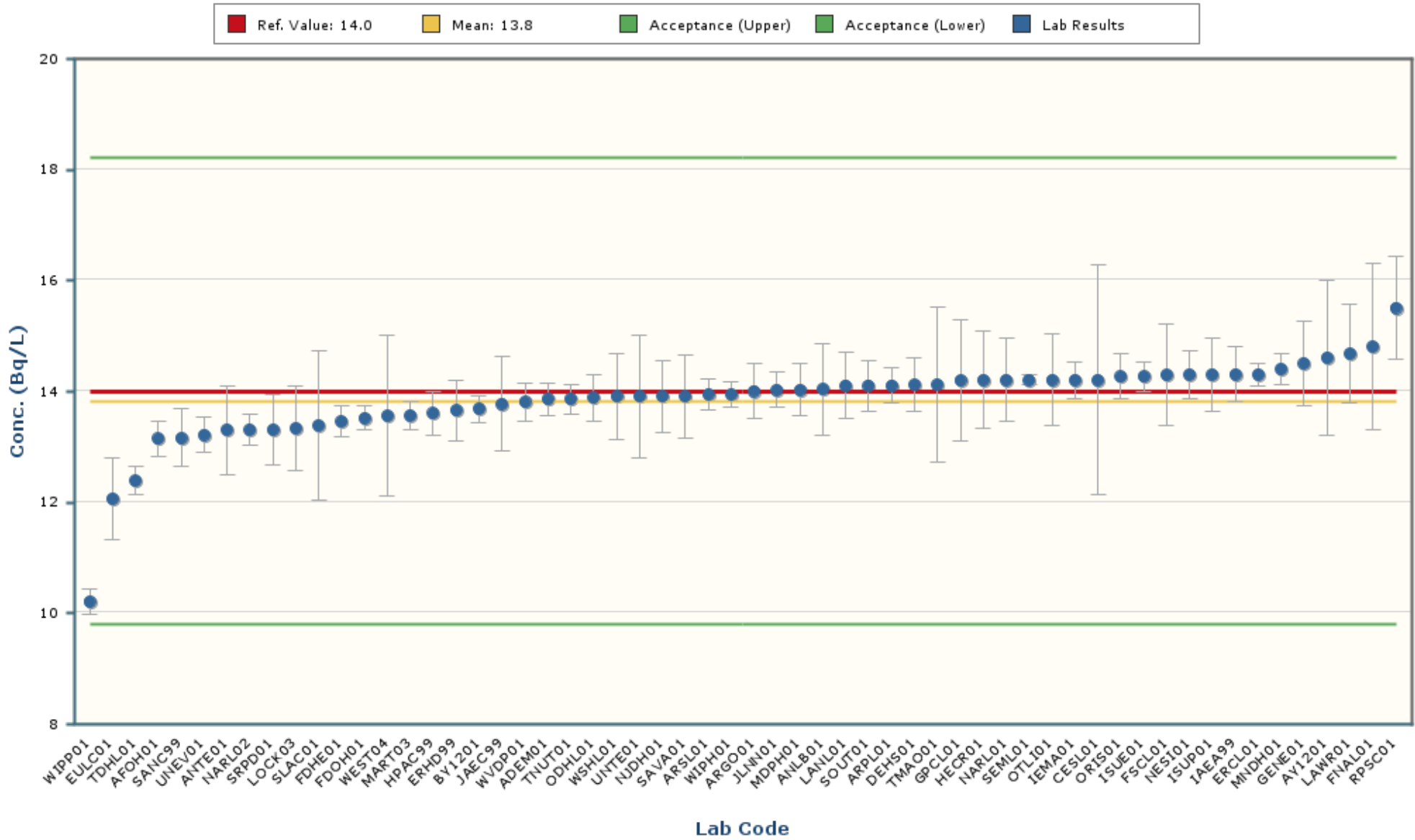
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 8.9 and 18.2 ( $\pm 5$  Standard Deviations).

The error bars encompassing each result are plotted at  $\pm$  one standard deviation.

# Cobalt-60

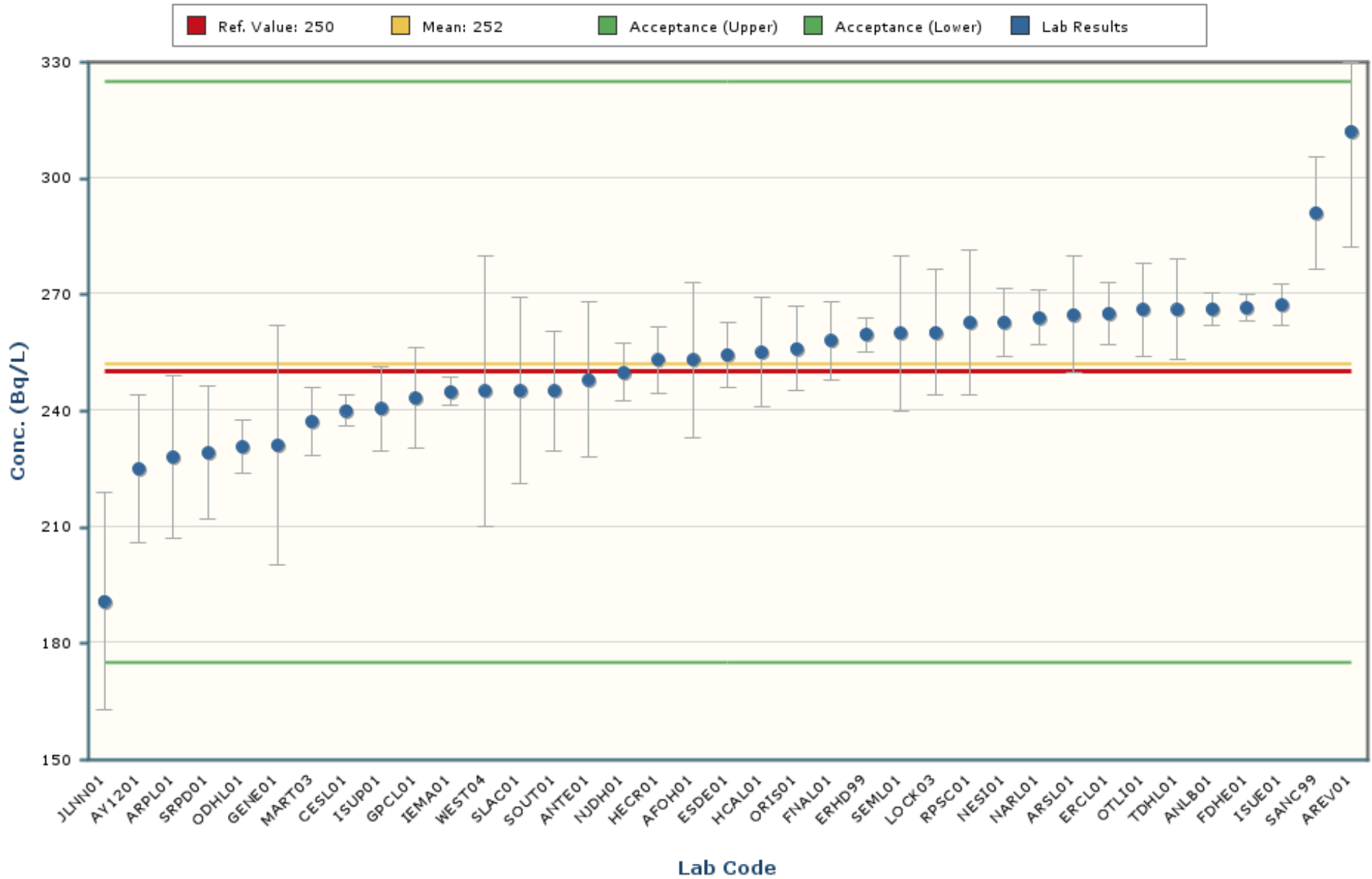
## MAPEP-21-MaW45



Notes:  
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .  
The chart shows only data points with values between 10.2 and 17.5 ( $\pm 5$  Standard Deviations).  
The error bars encompassing each result are plotted at  $\pm 1$  standard deviation.

# Hydrogen-3

MAPEP-21-MaW45



## Notes:

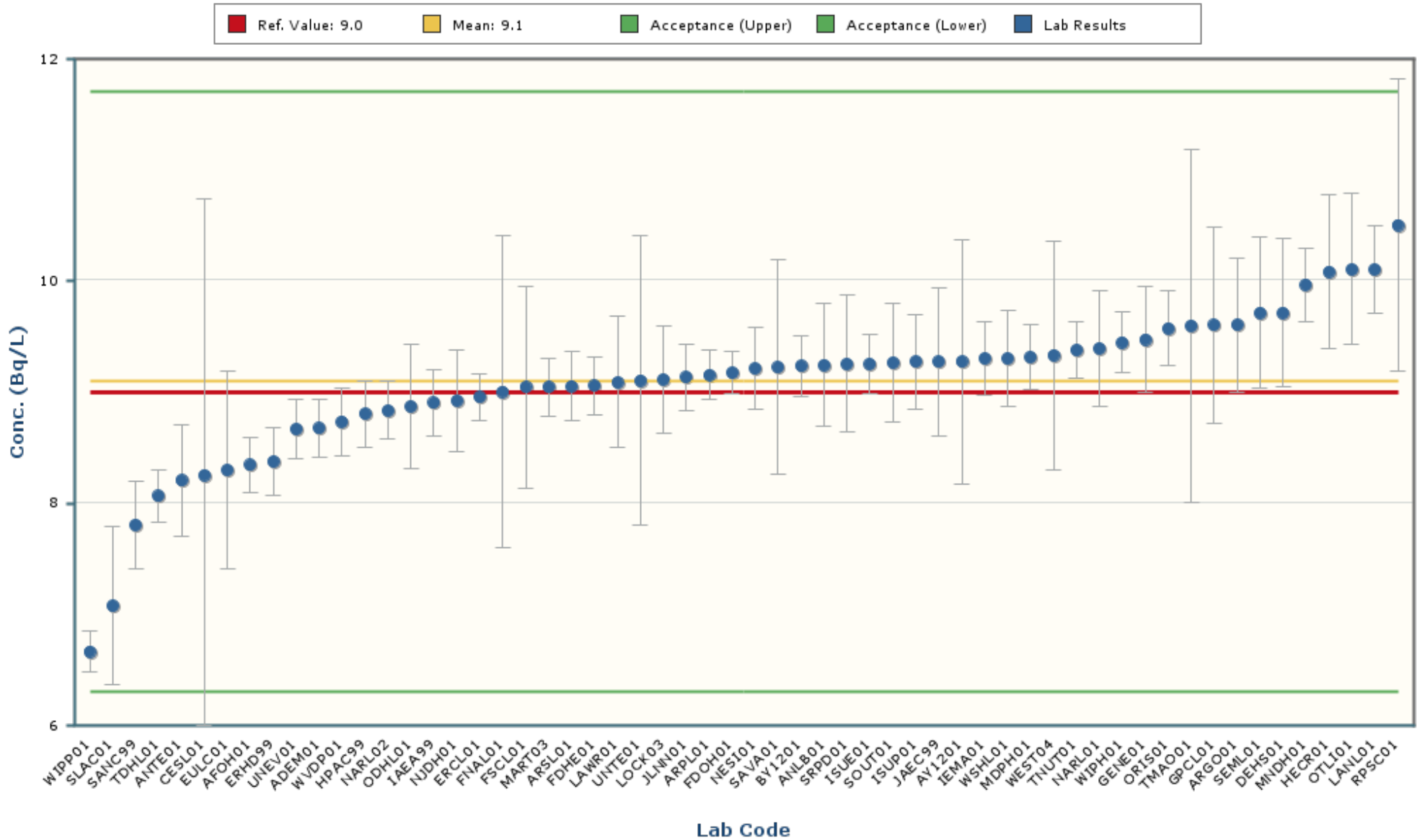
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 152 and 352 ( $\pm 5$  Standard Deviations).

The error bars encompassing each result are plotted at  $\pm$  one standard deviation.

# Manganese-54

## MAPEP-21-MaW45



### Notes:

The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

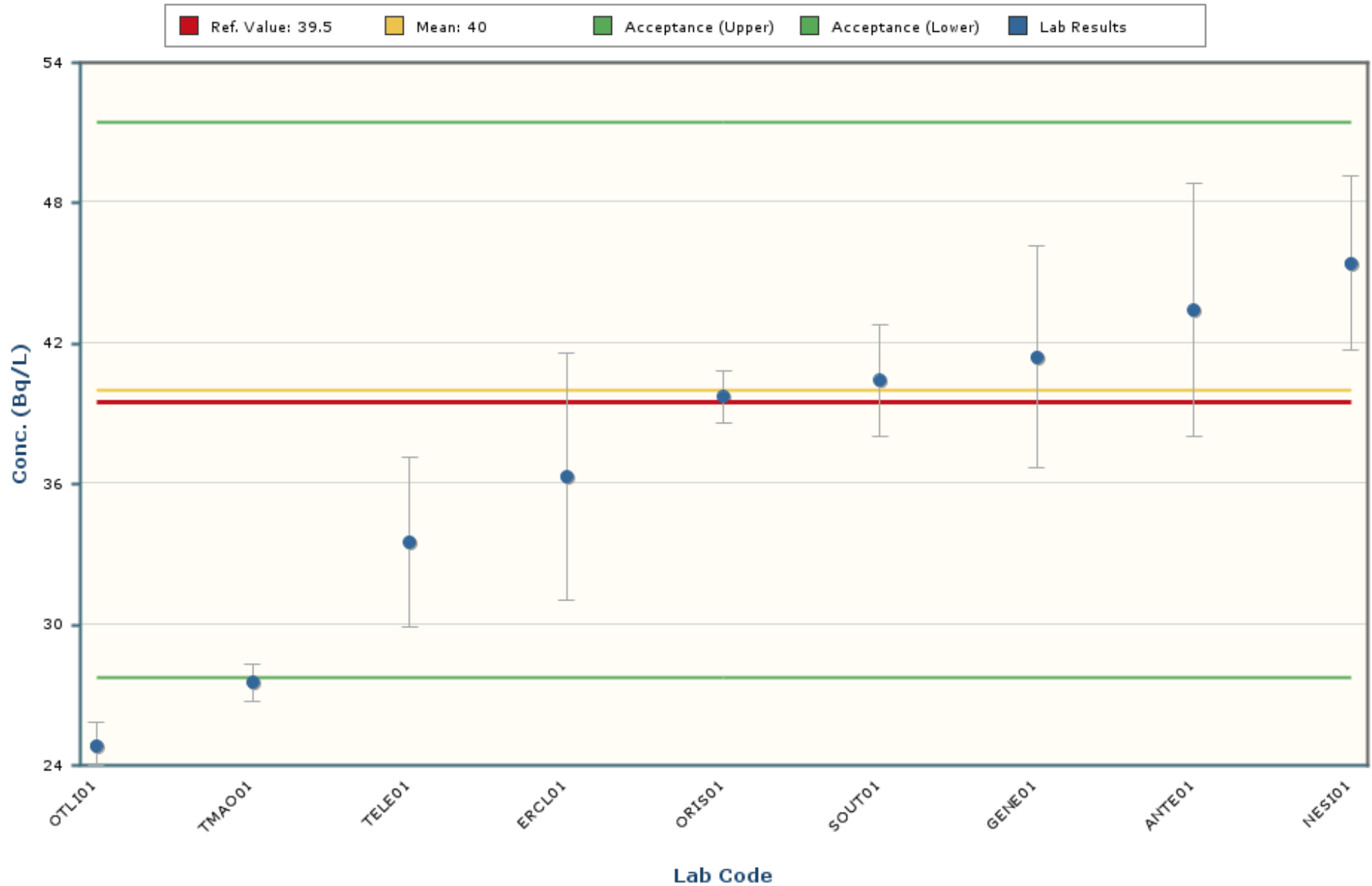
The chart shows only data points with values between 5.8 and 12.4 ( $\pm 5$  Standard Deviations).

The error bars encompassing each result are plotted at  $\pm$  one standard deviation.



# Nickel-63

## MAPEP-21-MaW45



### Notes:

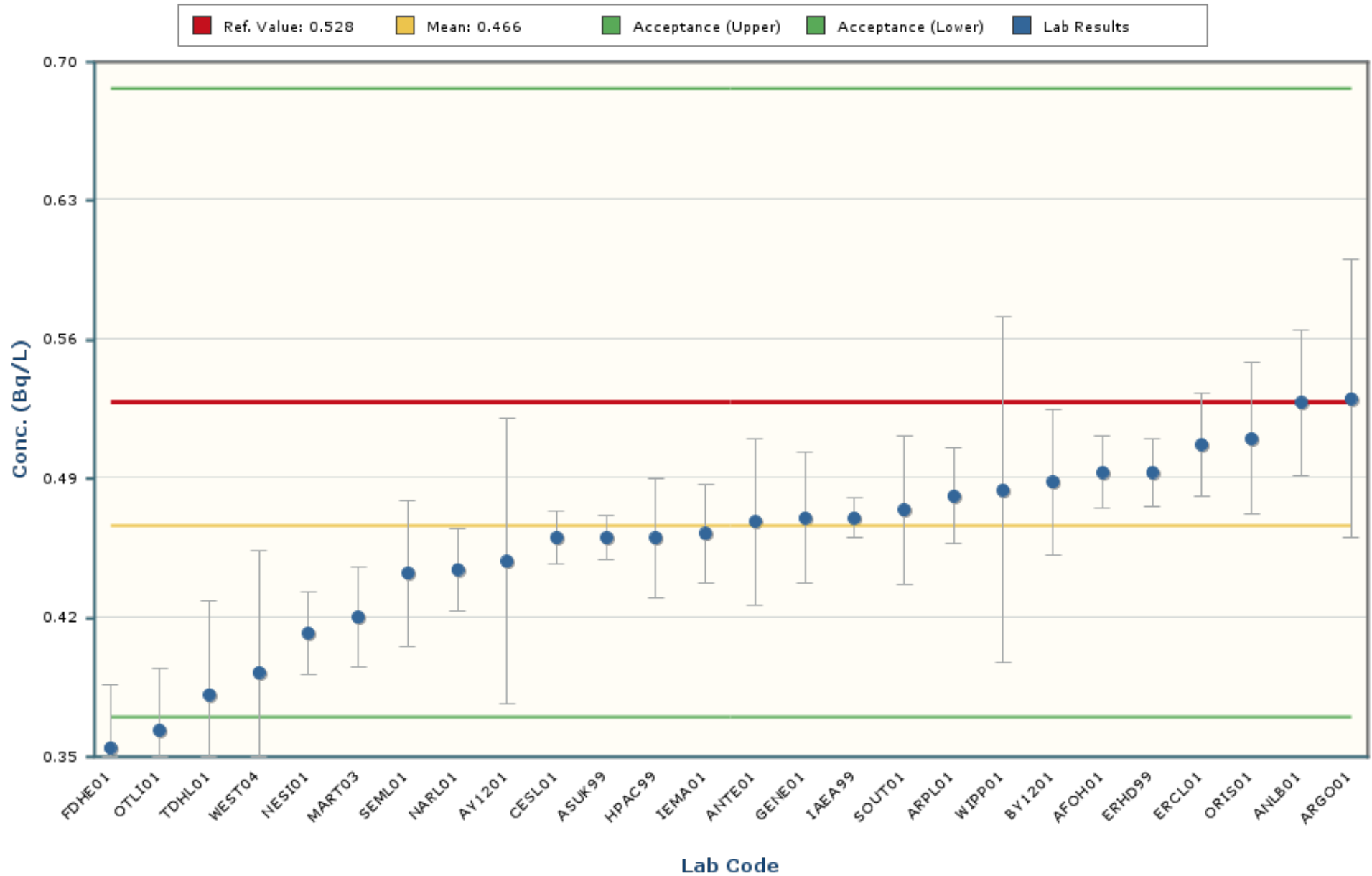
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 19.7 and 60.3 ( $\pm 5$  Standard Deviations).

The error bars encompassing each result are plotted at  $\pm$  one standard deviation.

# Plutonium-239/240

## MAPEP-21-MaW45



### Notes:

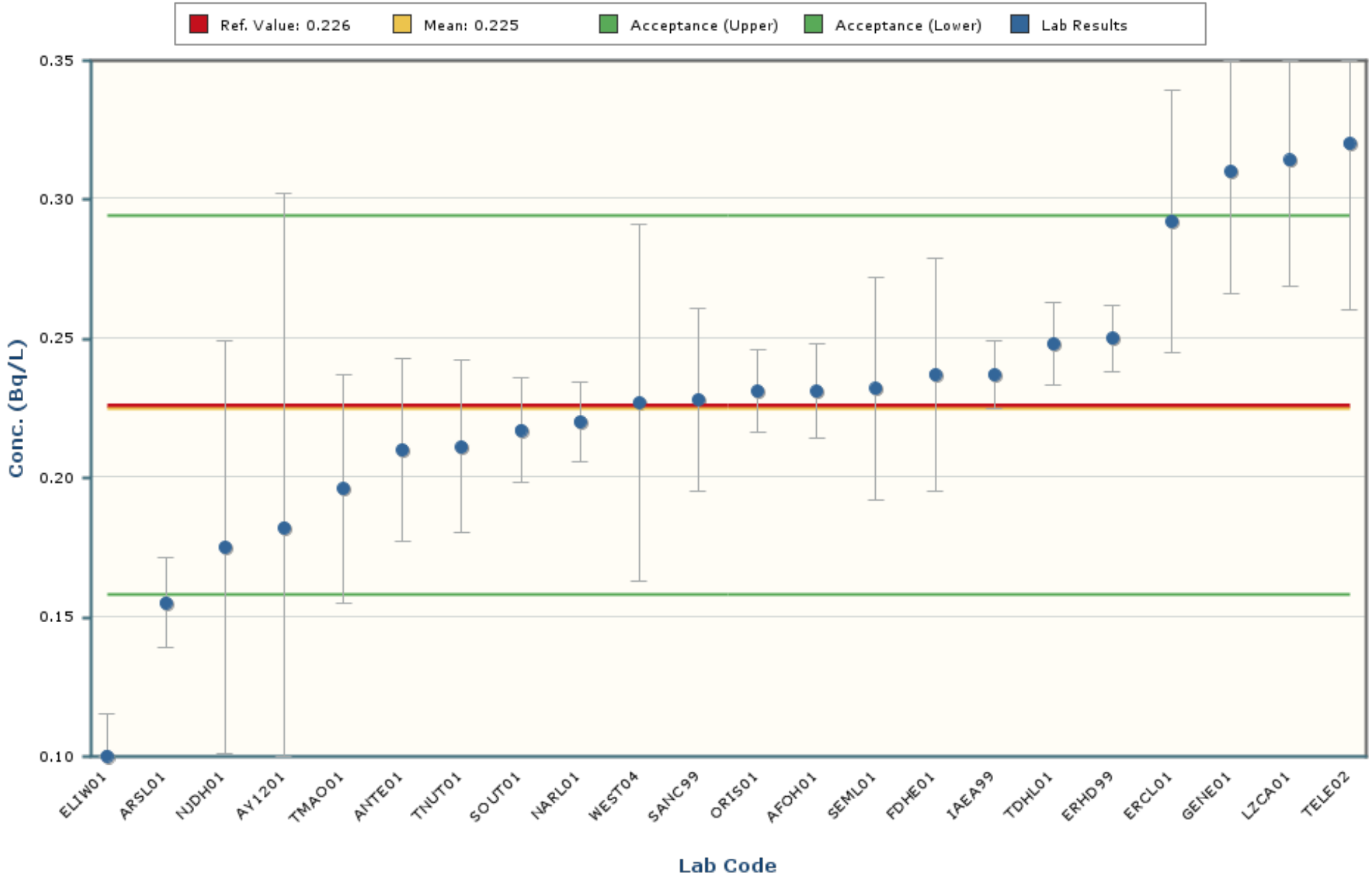
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 0.275 and 0.656 ( $\pm 5$  Standard Deviations).

The error bars encompassing each result are plotted at  $\pm$  one standard deviation.

# Radium-226

## MAPEP-21-MaW45



### Notes:

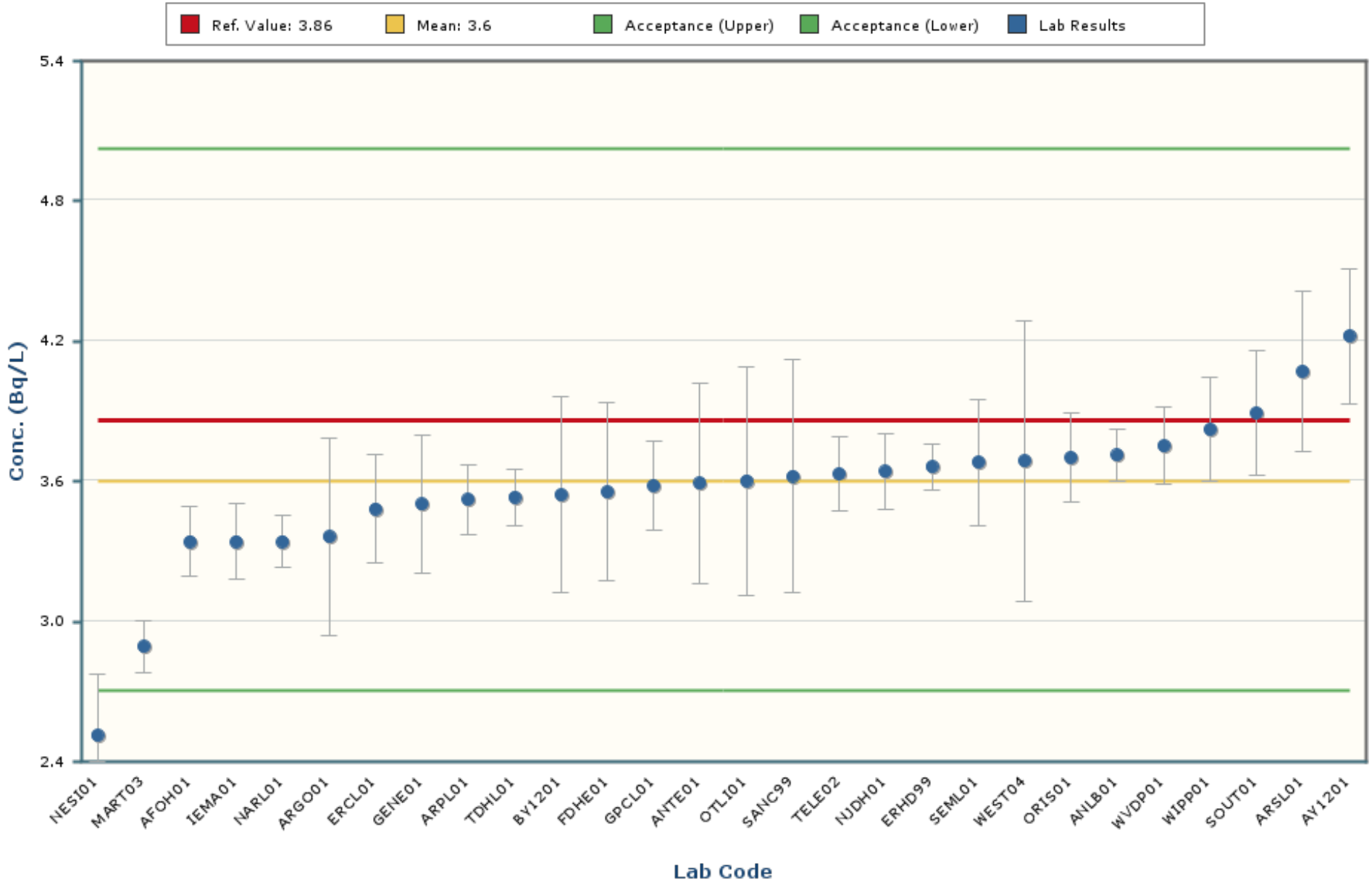
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 0.089 and 0.361 ( $\pm 5$  Standard Deviations).

The error bars encompassing each result are plotted at  $\pm 1$  standard deviation.

# Strontium-90

## MAPEP-21-MaW45



### Notes:

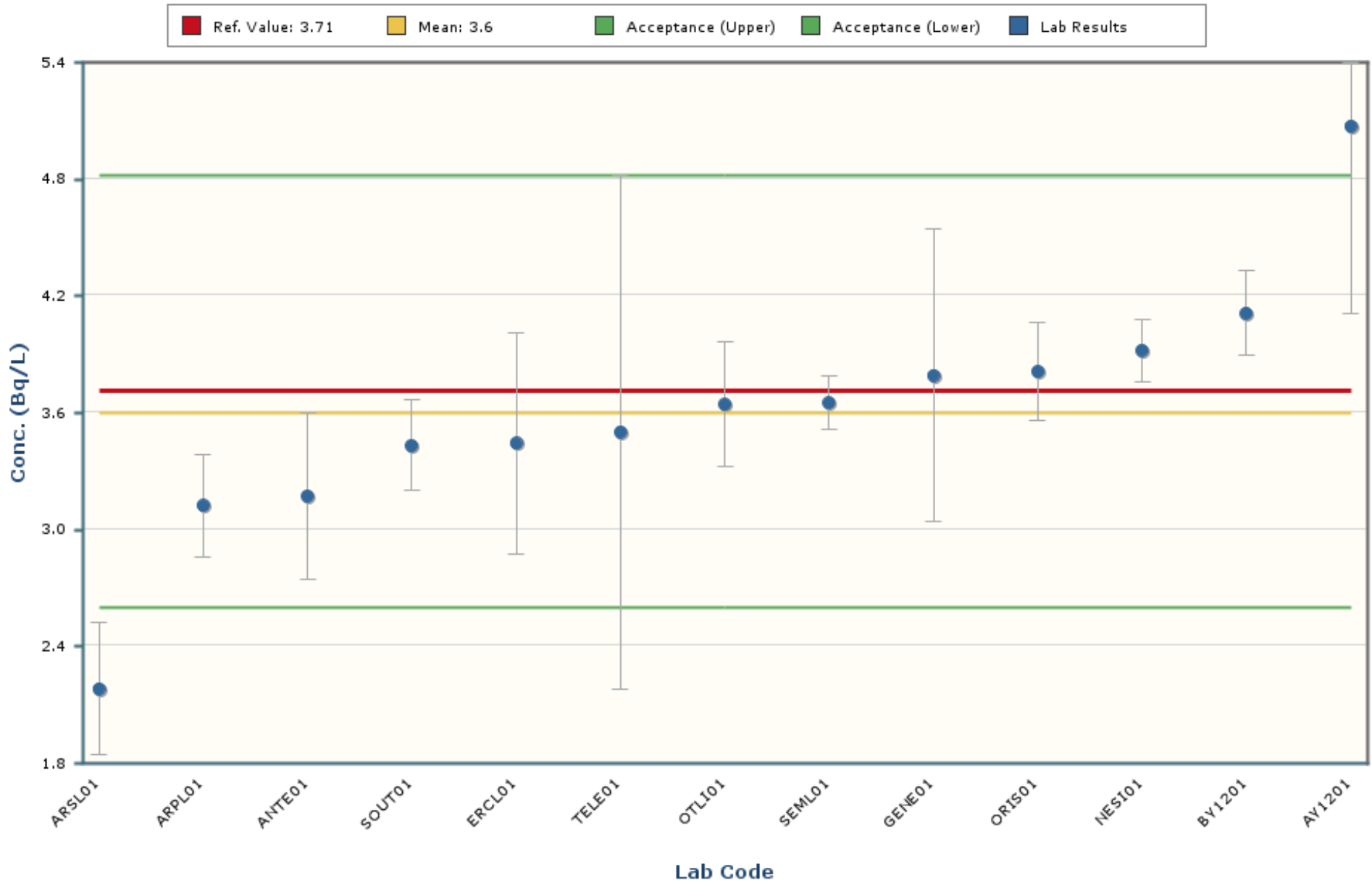
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 2.36 and 4.84 ( $\pm 5$  Standard Deviations).

The error bars encompassing each result are plotted at  $\pm 1$  standard deviation.

# Technetium-99

## MAPEP-21-MaW45



### Notes:

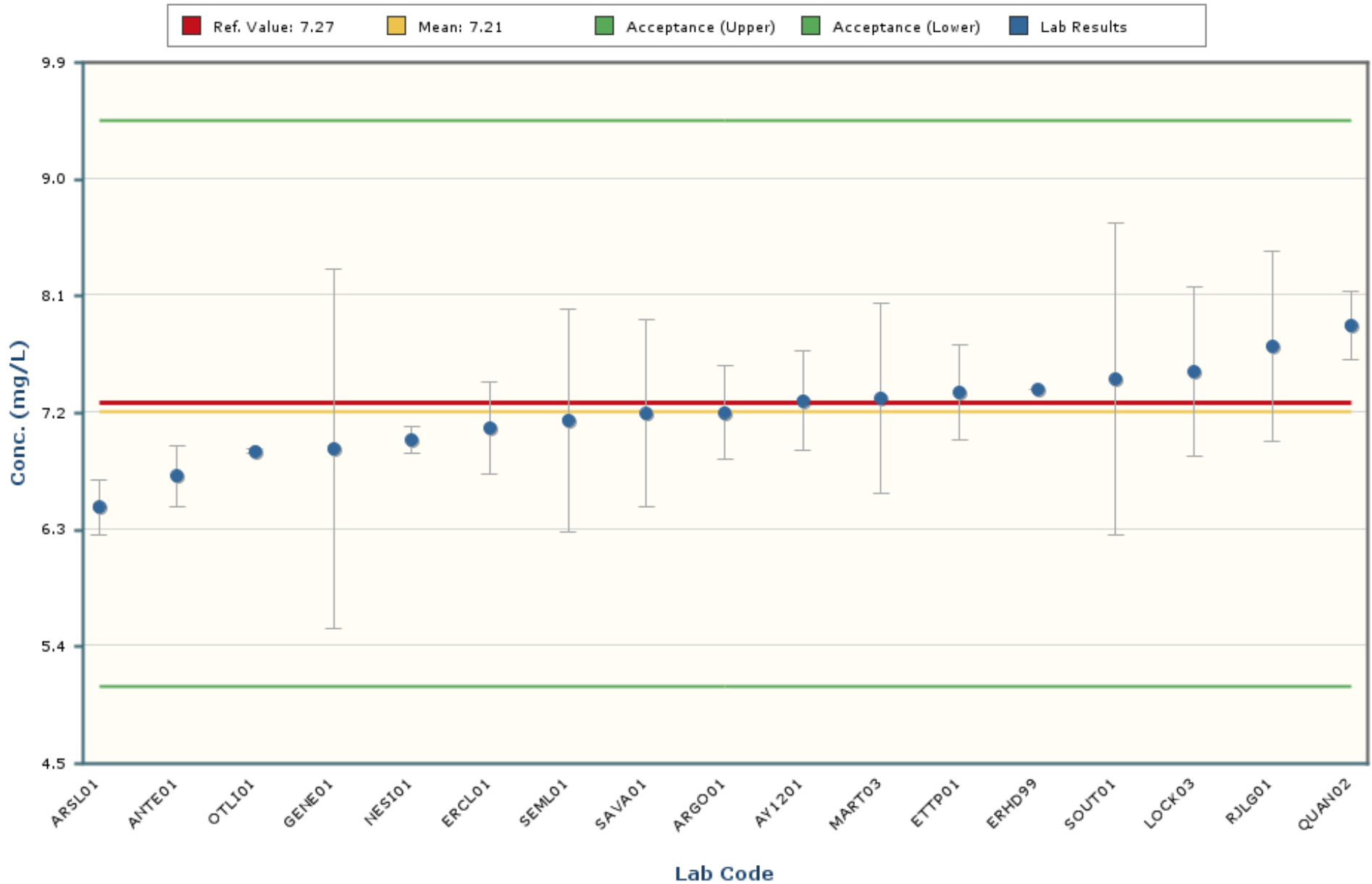
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 2.08 and 5.12 ( $\pm 5$  Standard Deviations).

The error bars encompassing each result are plotted at  $\pm 1$  standard deviation.

# Antimony

## MAPEP-21-MaW45



### Notes:

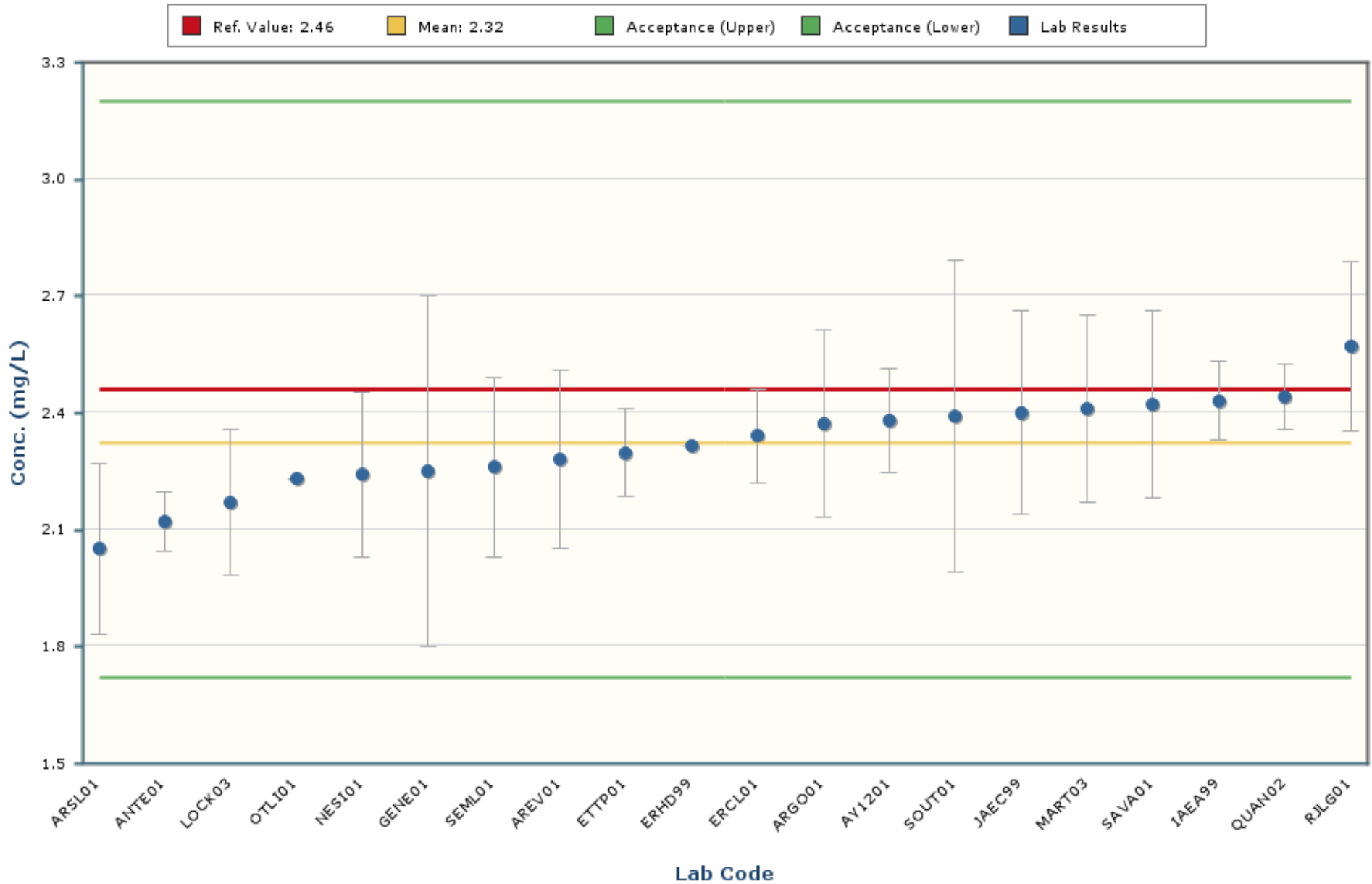
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 5.46 and 8.95 ( $\pm 5$  Standard Deviations).

The error bars encompassing each result are plotted at  $\pm$  one standard deviation.

# Arsenic

## MAPEP-21-MaW45



### Notes:

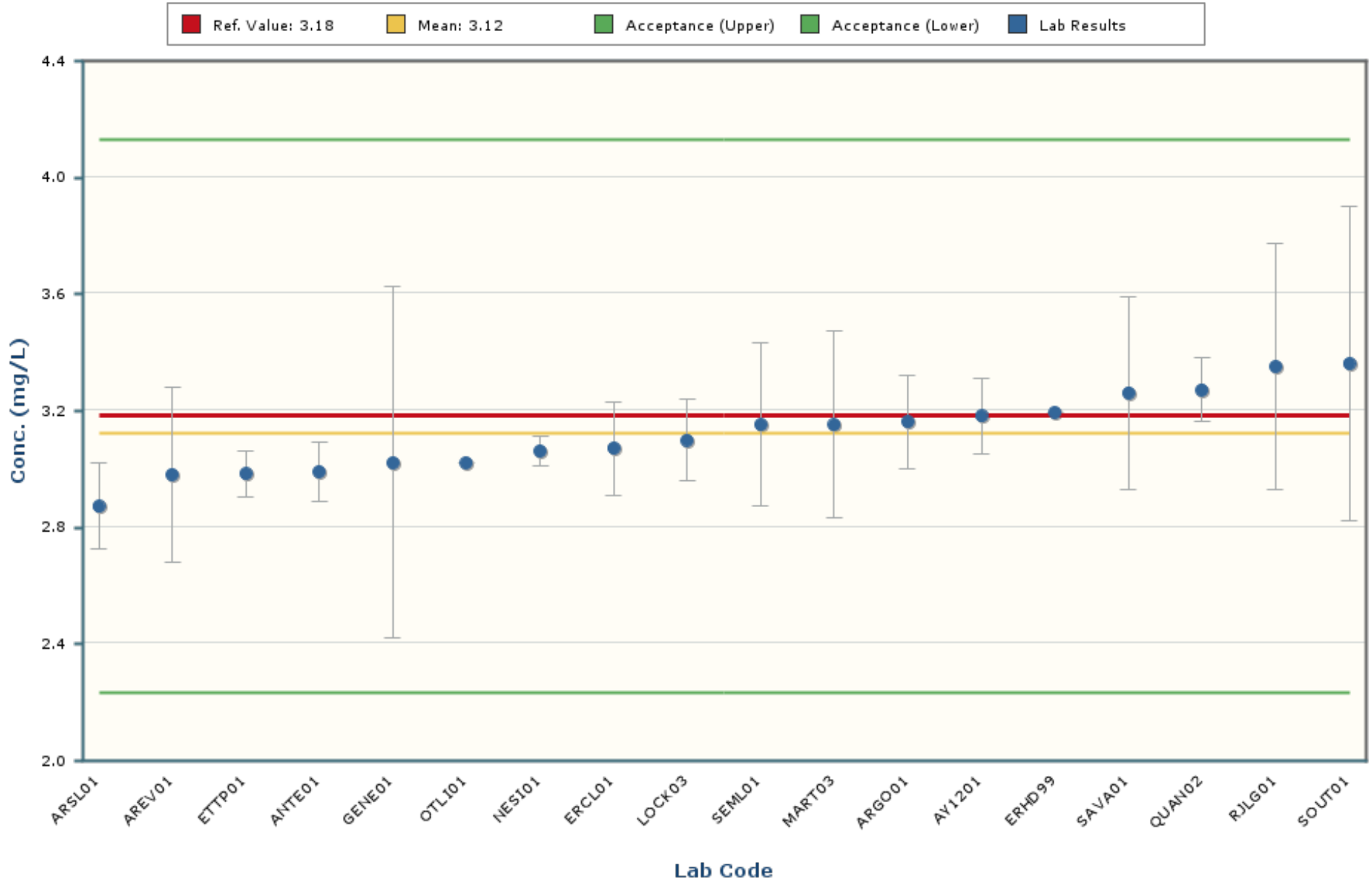
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 1.70 and 2.93 ( $\pm 5$  Standard Deviations).

The error bars encompassing each result are plotted at  $\pm$  one standard deviation.

# Barium

MAPEP-21-MaW45



## Notes:

The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

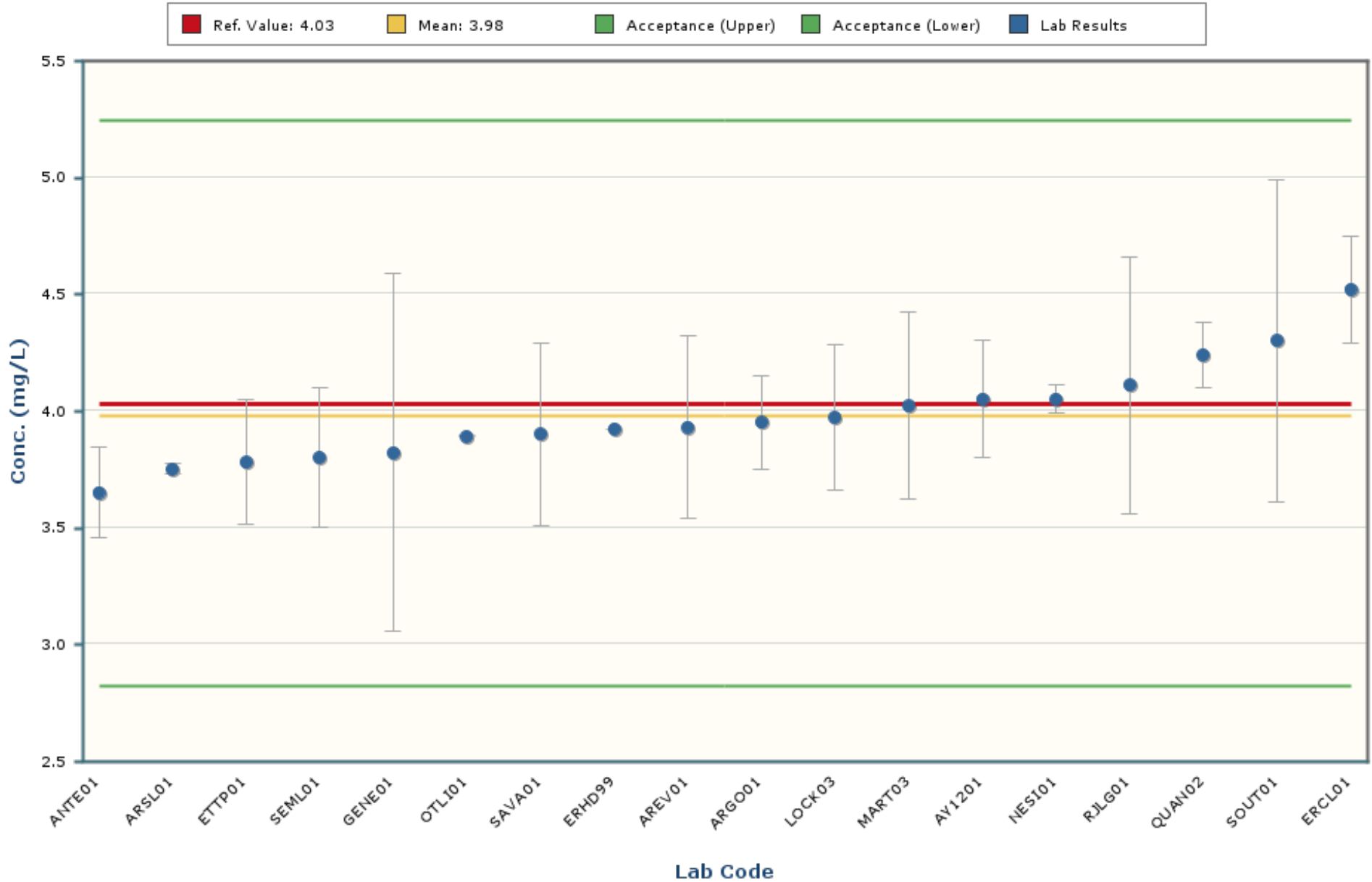
The chart shows only data points with values between 2.45 and 3.79 ( $\pm 5$  Standard Deviations).

The error bars encompassing each result are plotted at  $\pm 1$  standard deviation.



# Beryllium

MAPEP-21-MaW45



## Notes:

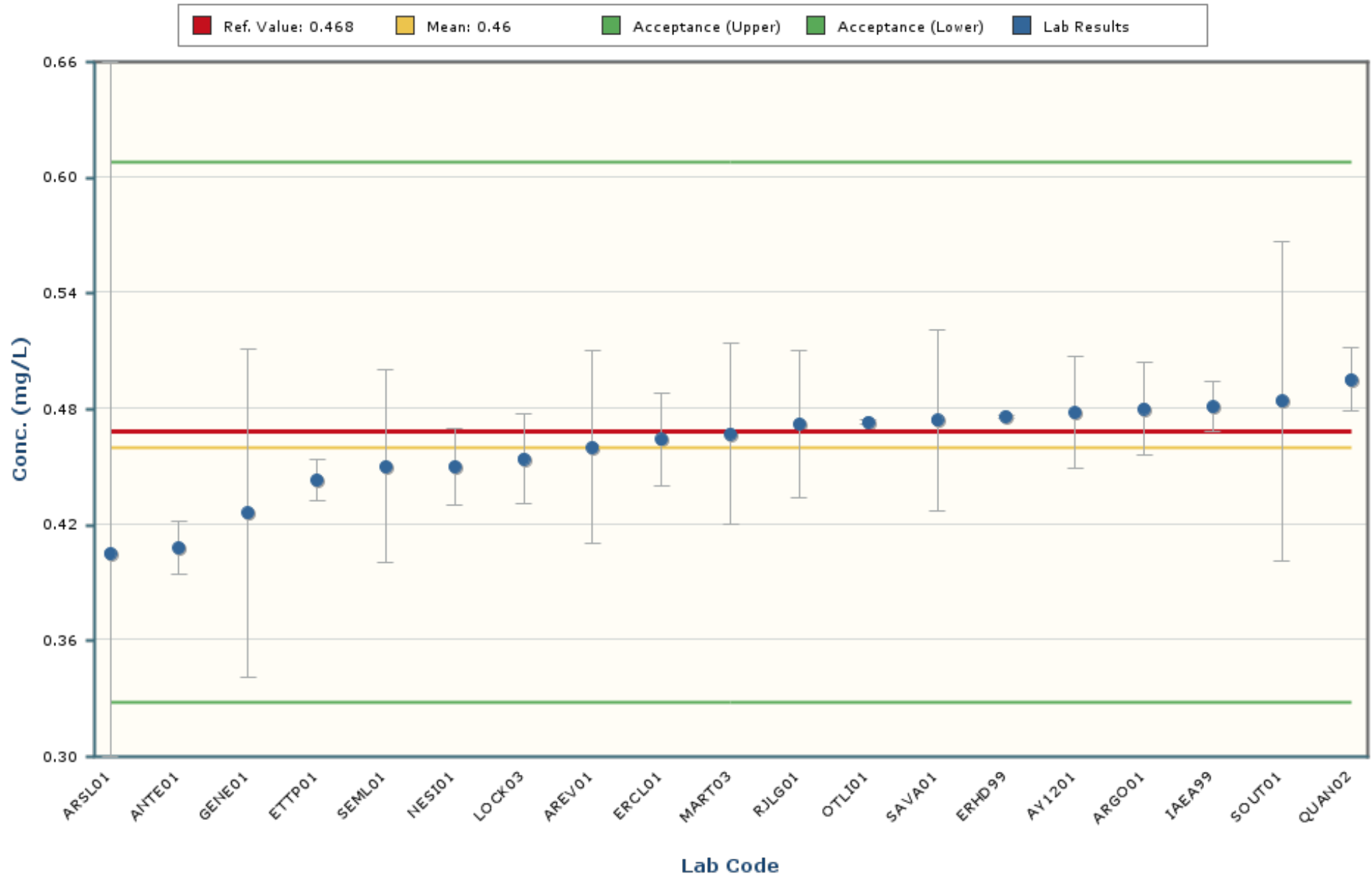
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 2.92 and 5.05 ( $\pm 5$  Standard Deviations).

The error bars encompassing each result are plotted at  $\pm 1$  standard deviation.

# Cadmium

## MAPEP-21-MaW45



### Notes:

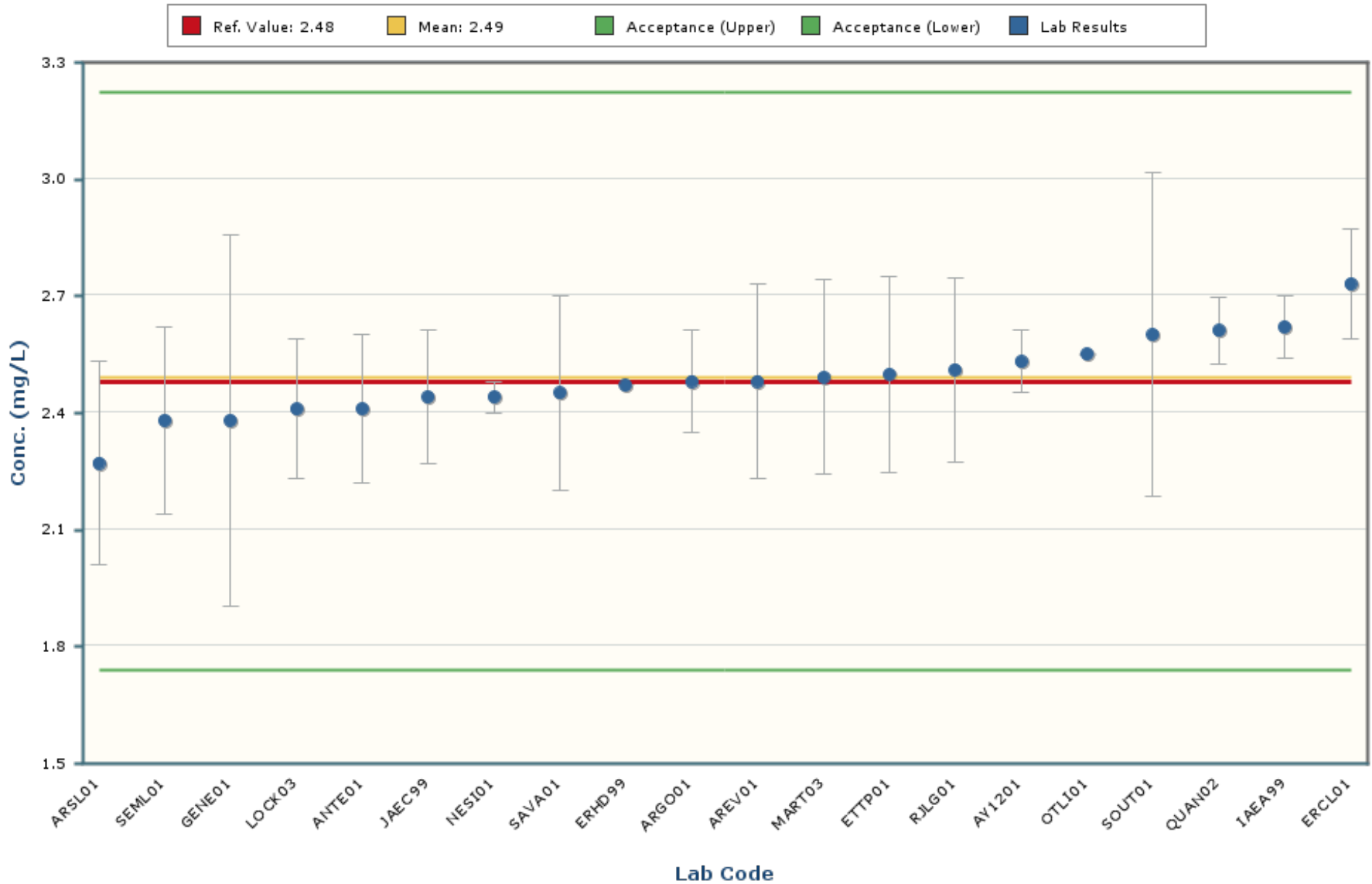
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 0.335 and 0.585 ( $\pm 5$  Standard Deviations).

The error bars encompassing each result are plotted at  $\pm$  one standard deviation.

# Chromium

## MAPEP-21-MaW45



### Notes:

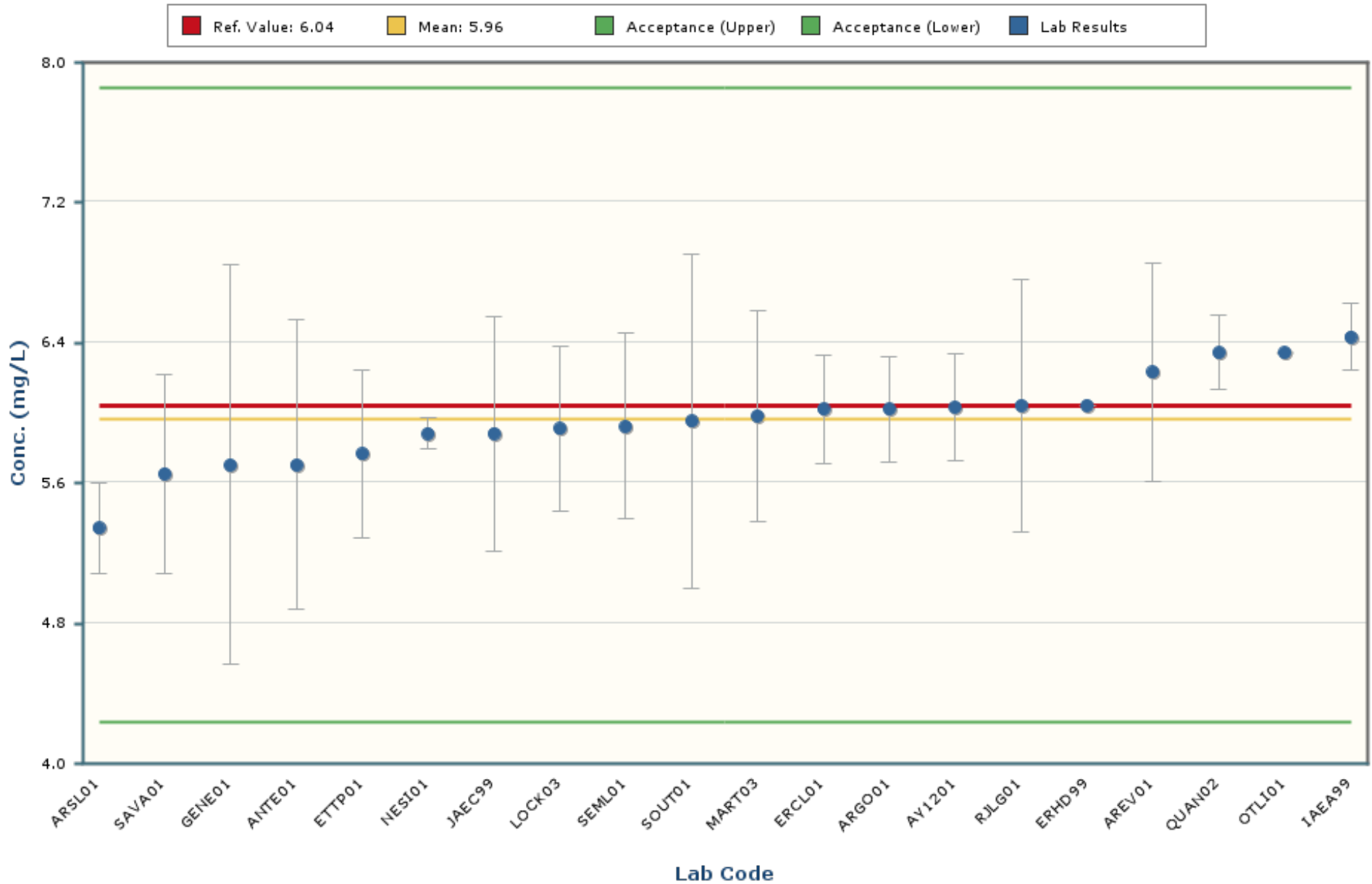
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 1.98 and 3.00 ( $\pm 5$  Standard Deviations).

The error bars encompassing each result are plotted at  $\pm 1$  standard deviation.

# Cobalt

## MAPEP-21-MaW45



### Notes:

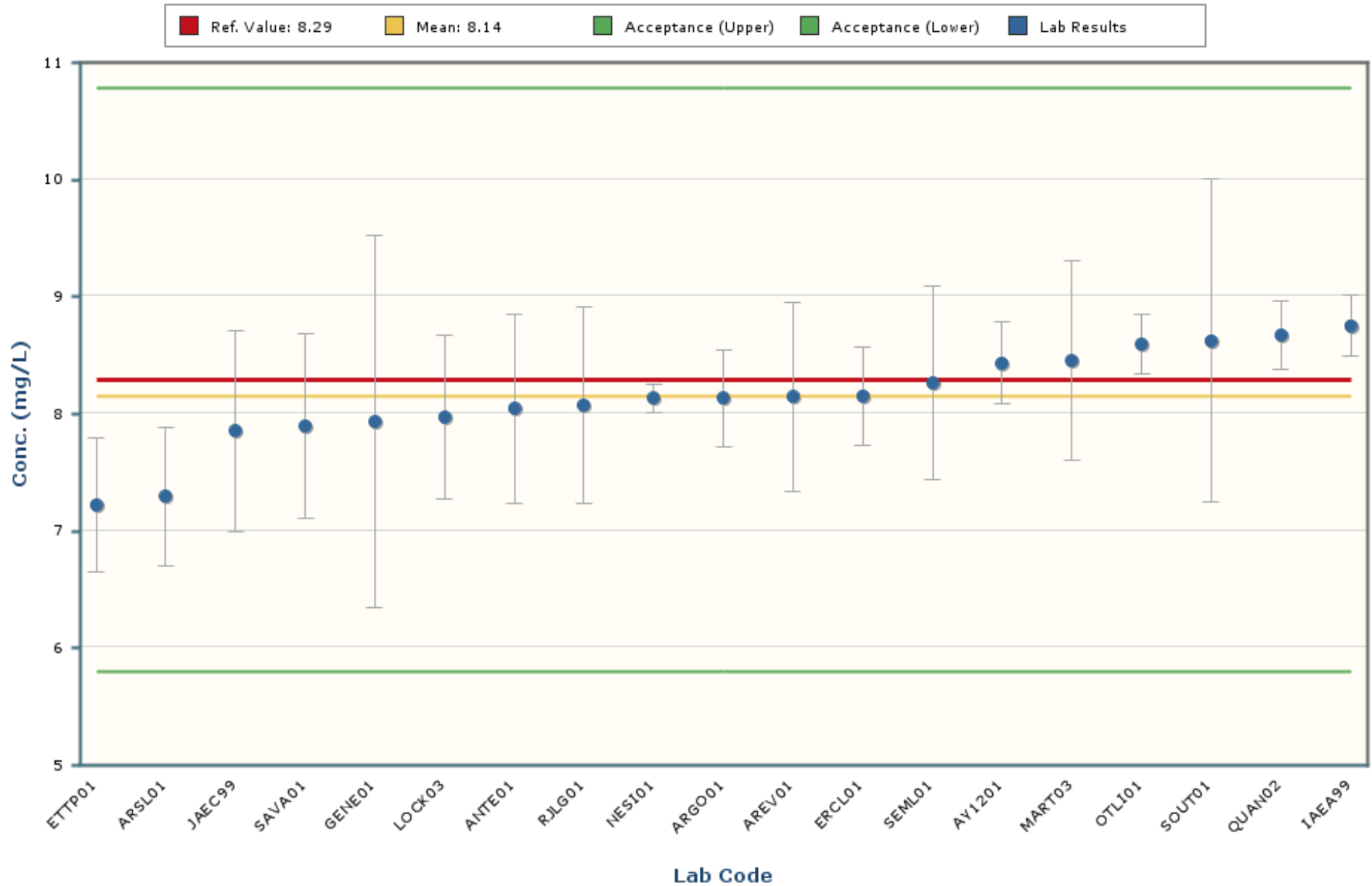
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 4.66 and 7.26 ( $\pm 5$  Standard Deviations).

The error bars encompassing each result are plotted at  $\pm 1$  standard deviation.

# Copper

## MAPEP-21-MaW45



### Notes:

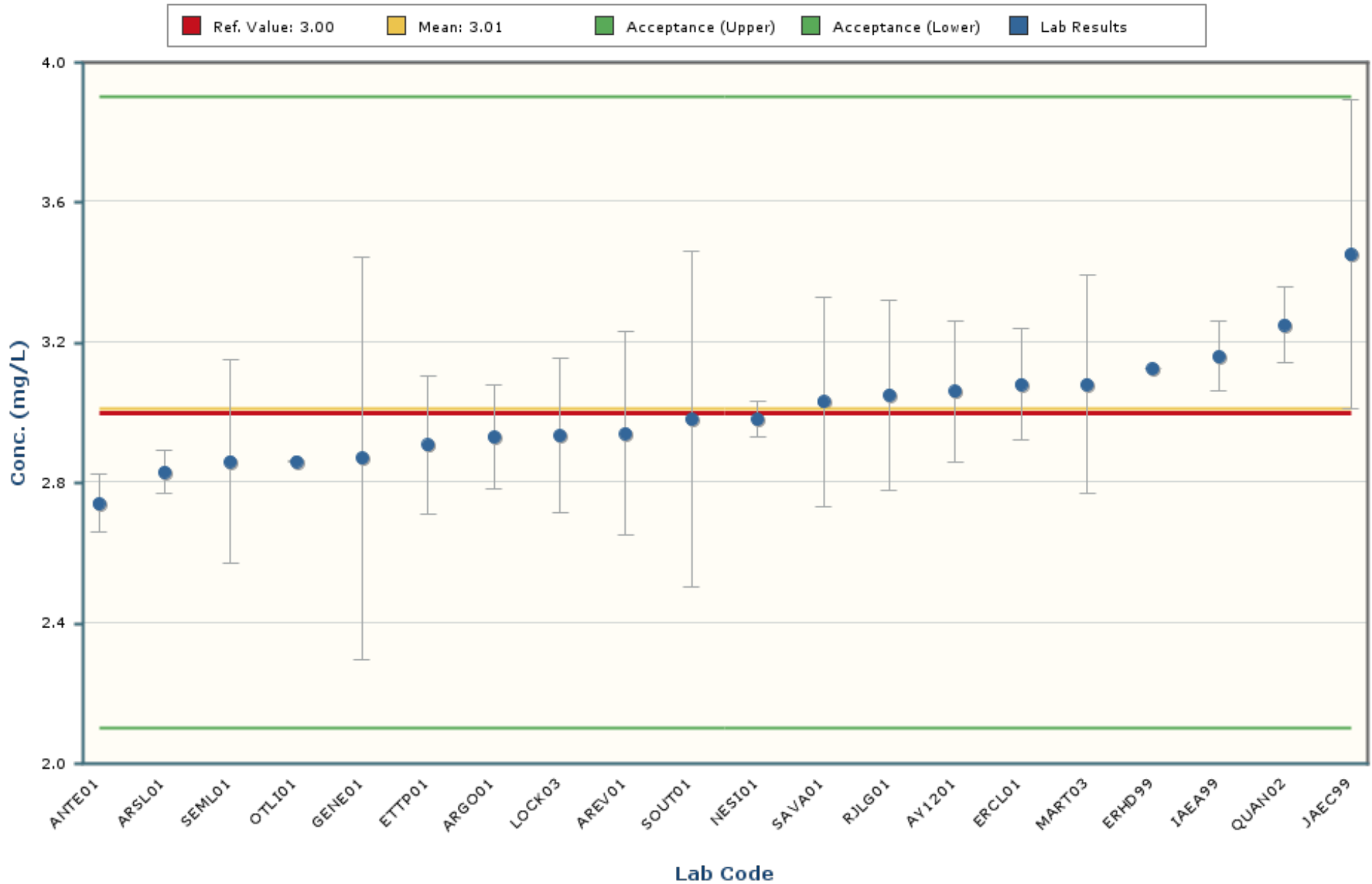
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 6.06 and 10.21 ( $\pm 5$  Standard Deviations).

The error bars encompassing each result are plotted at  $\pm 1$  standard deviation.

# Lead

## MAPEP-21-MaW45



### Notes:

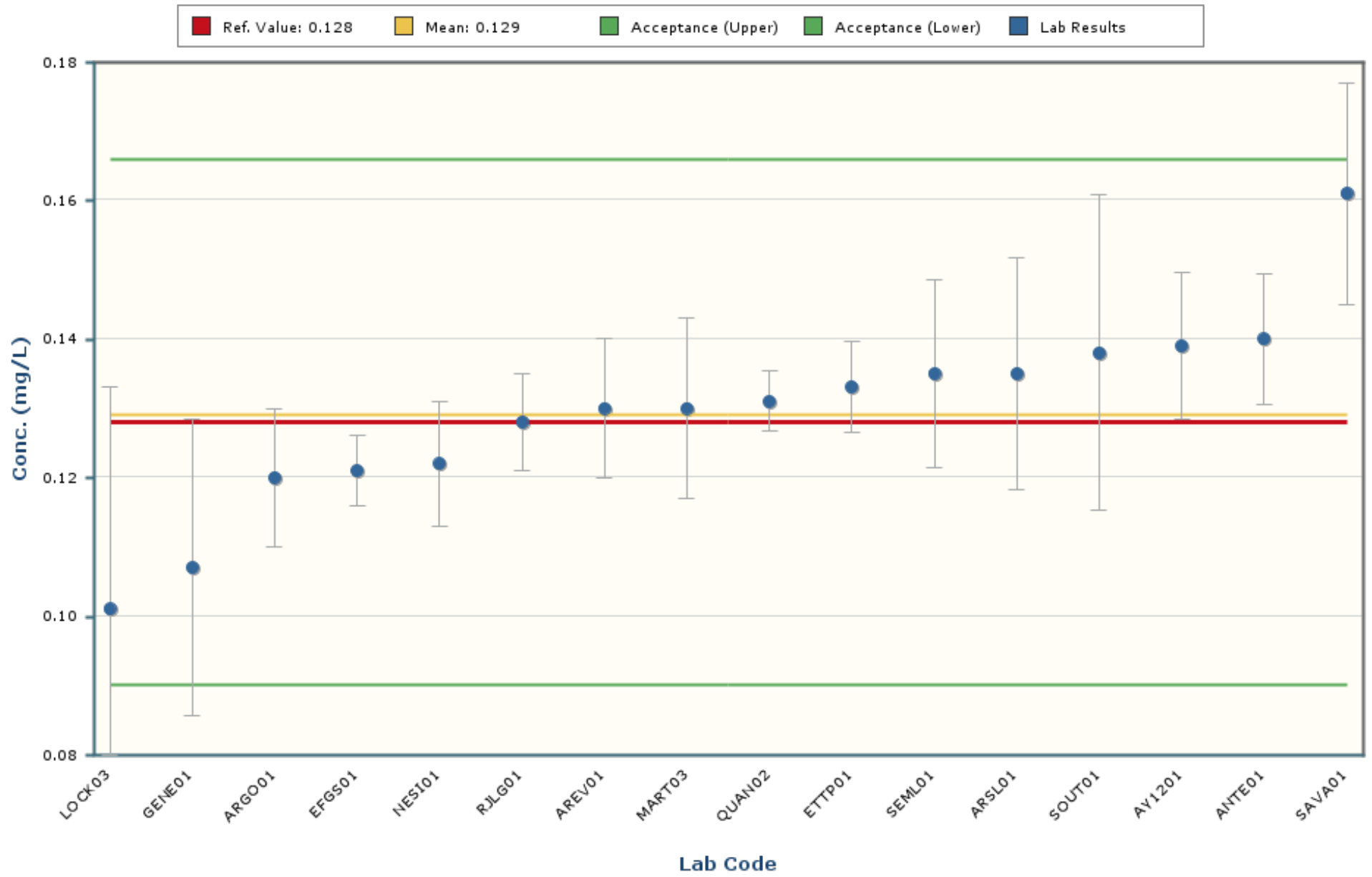
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 2.19 and 3.82 ( $\pm 5$  Standard Deviations).

The error bars encompassing each result are plotted at  $\pm 1$  standard deviation.

# Mercury

## MAPEP-21-MaW45

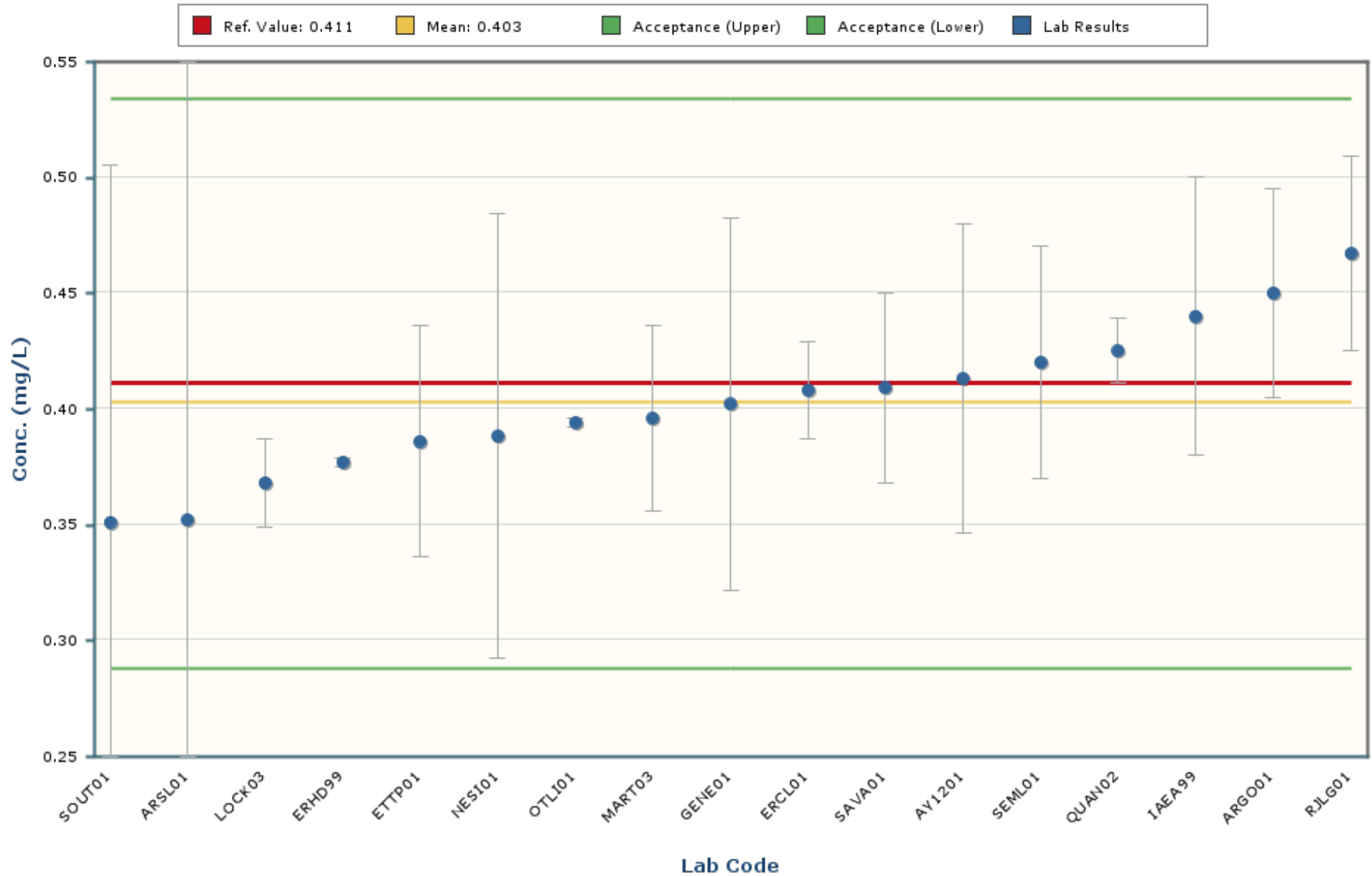


### Notes:

The chart mean excludes values outside of a bias range of  $\pm 30\%$ .  
The chart shows only data points with values between 0.060 and 0.199 ( $\pm 5$  Standard Deviations).  
The error bars encompassing each result are plotted at  $\pm$  one standard deviation.

# Selenium

## MAPEP-21-MaW45



### Notes:

The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

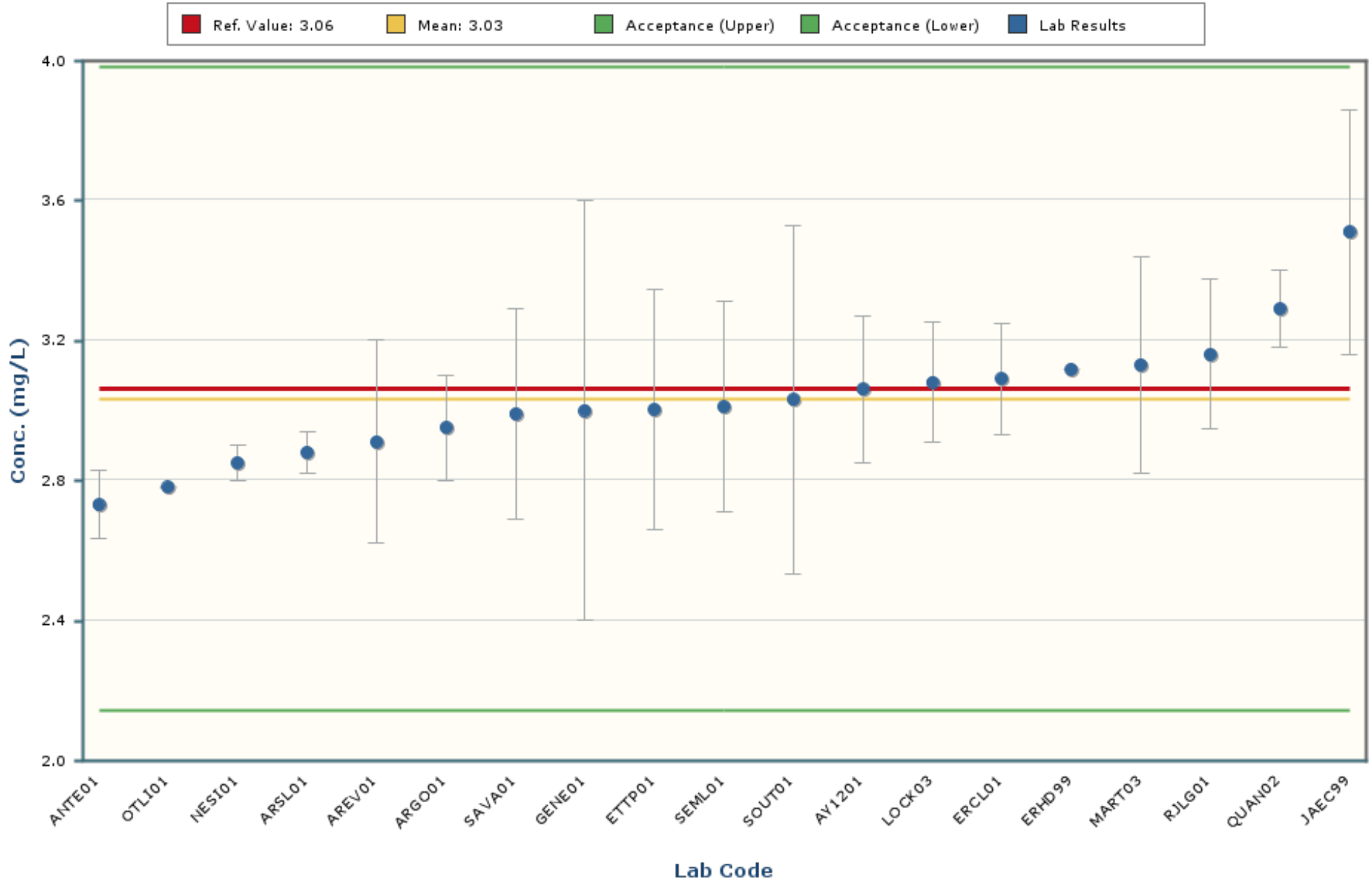
The chart shows only data points with values between 0.242 and 0.563 ( $\pm 5$  Standard Deviations).

The error bars encompassing each result are plotted at  $\pm 1$  standard deviation.



# Thallium

## MAPEP-21-MaW45



### Notes:

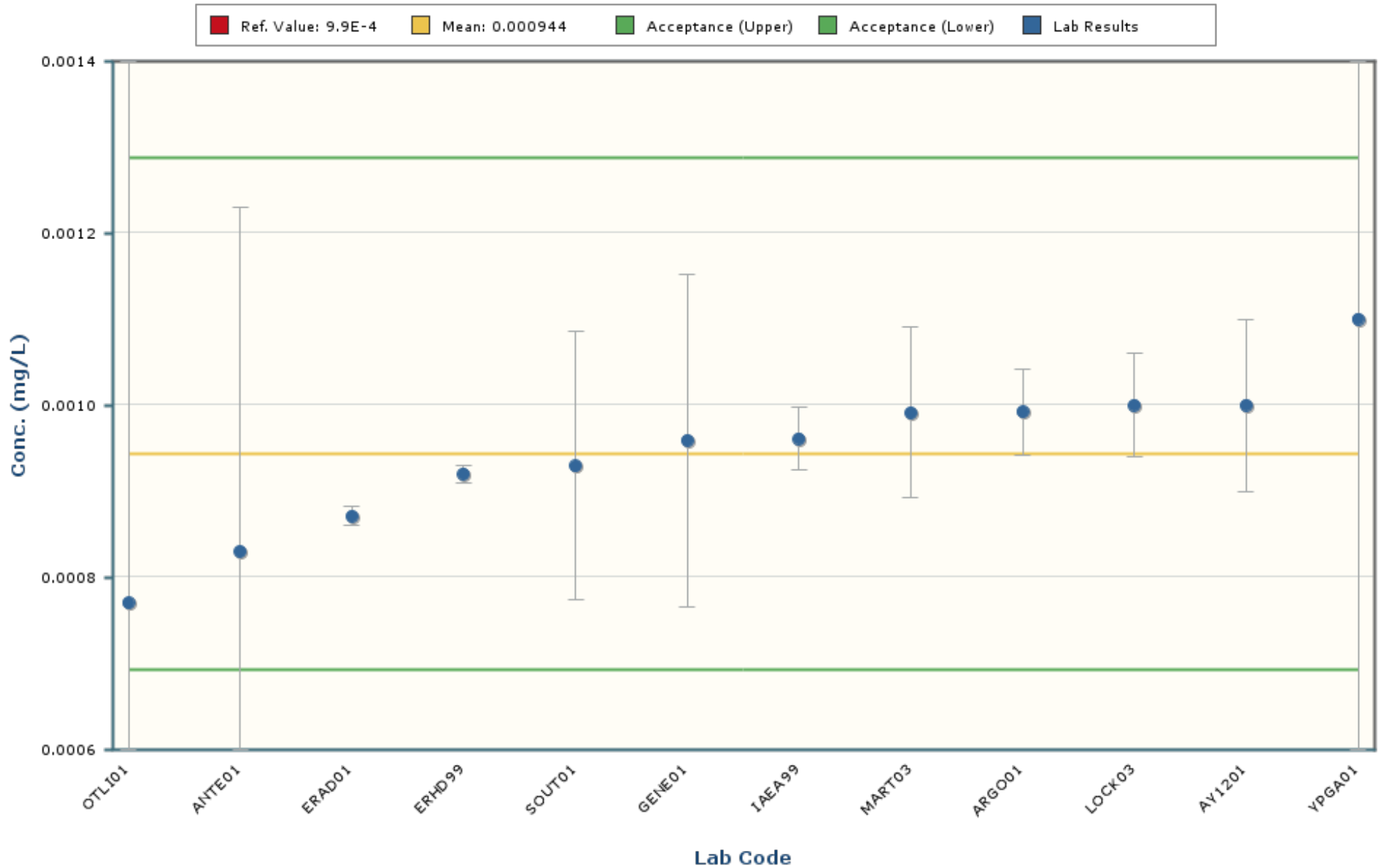
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 2.14 and 3.92 ( $\pm 5$  Standard Deviations).

The error bars encompassing each result are plotted at  $\pm 1$  standard deviation.

# Uranium-238

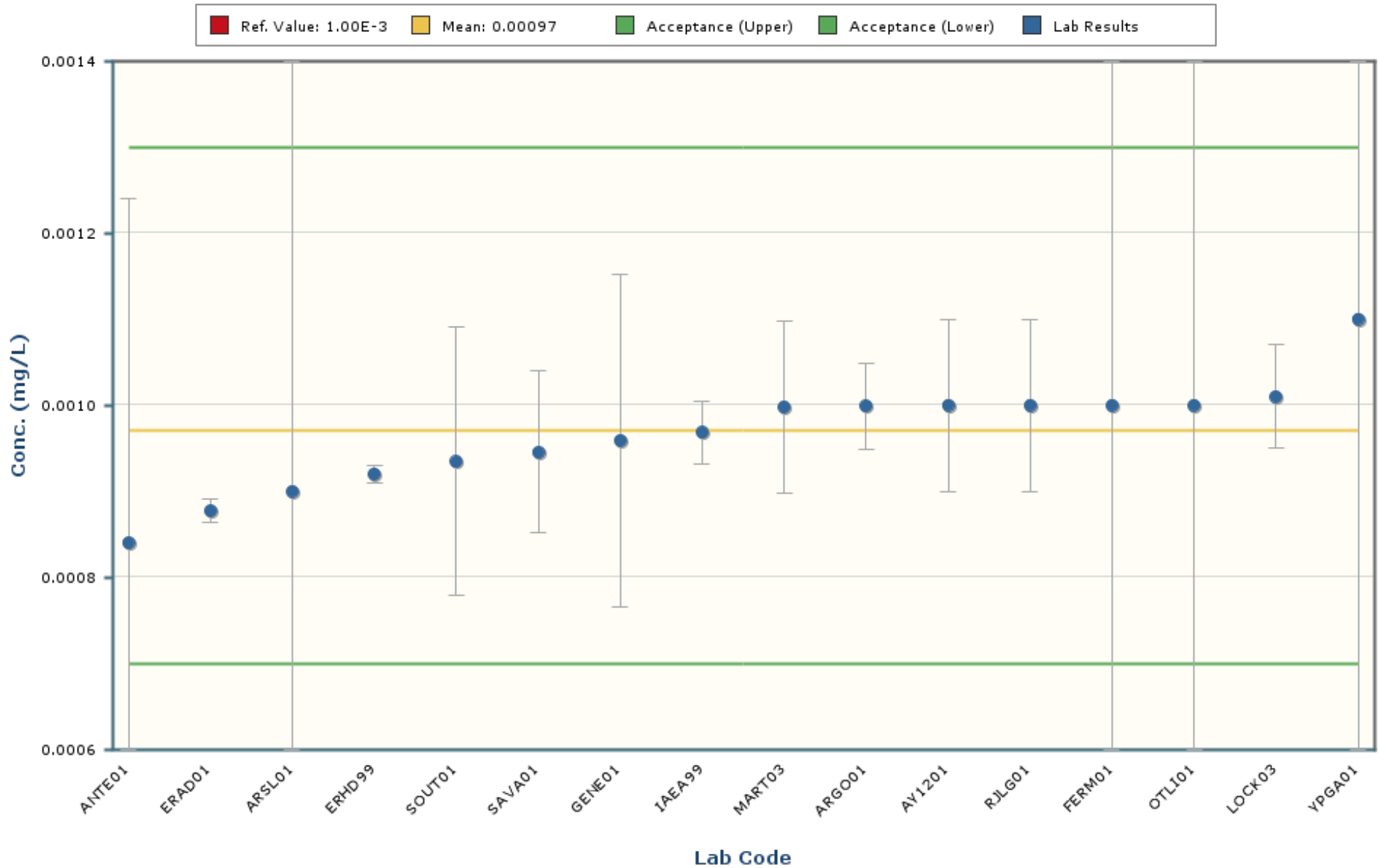
## MAPEP-21-MaW45



Notes:  
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .  
The chart shows only data points with values between 0.000504 and 0.001383 ( $\pm 5$  Standard Deviations).  
The error bars encompassing each result are plotted at  $\pm$  one standard deviation.

# Uranium-Total

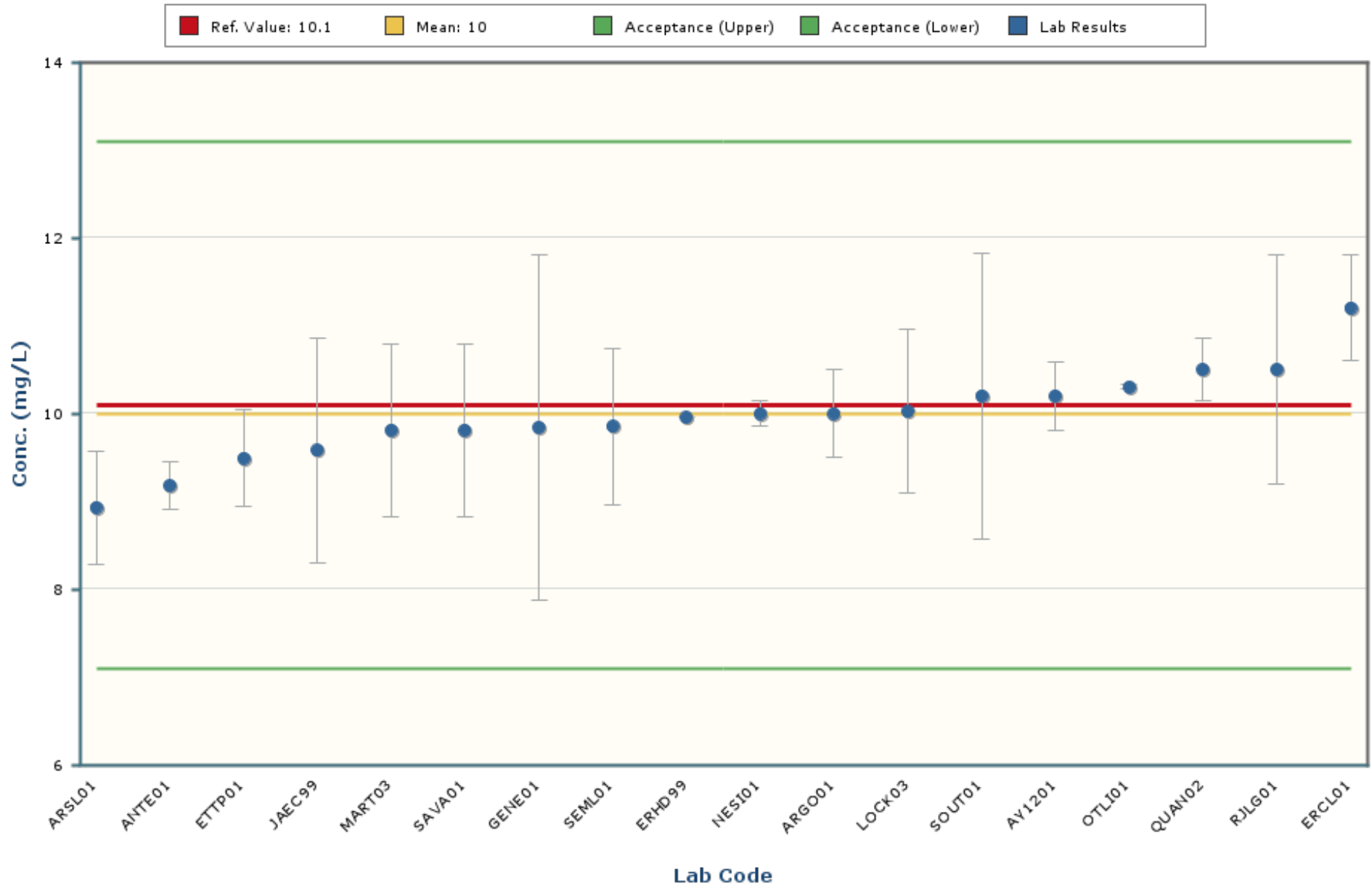
## MAPEP-21-MaW45



Notes:  
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .  
The chart shows only data points with values between 0.00065 and 0.00128 ( $\pm 5$  Standard Deviations).  
The error bars encompassing each result are plotted at  $\pm 1$  standard deviation.

# Vanadium

MAPEP-21-MaW45



## Notes:

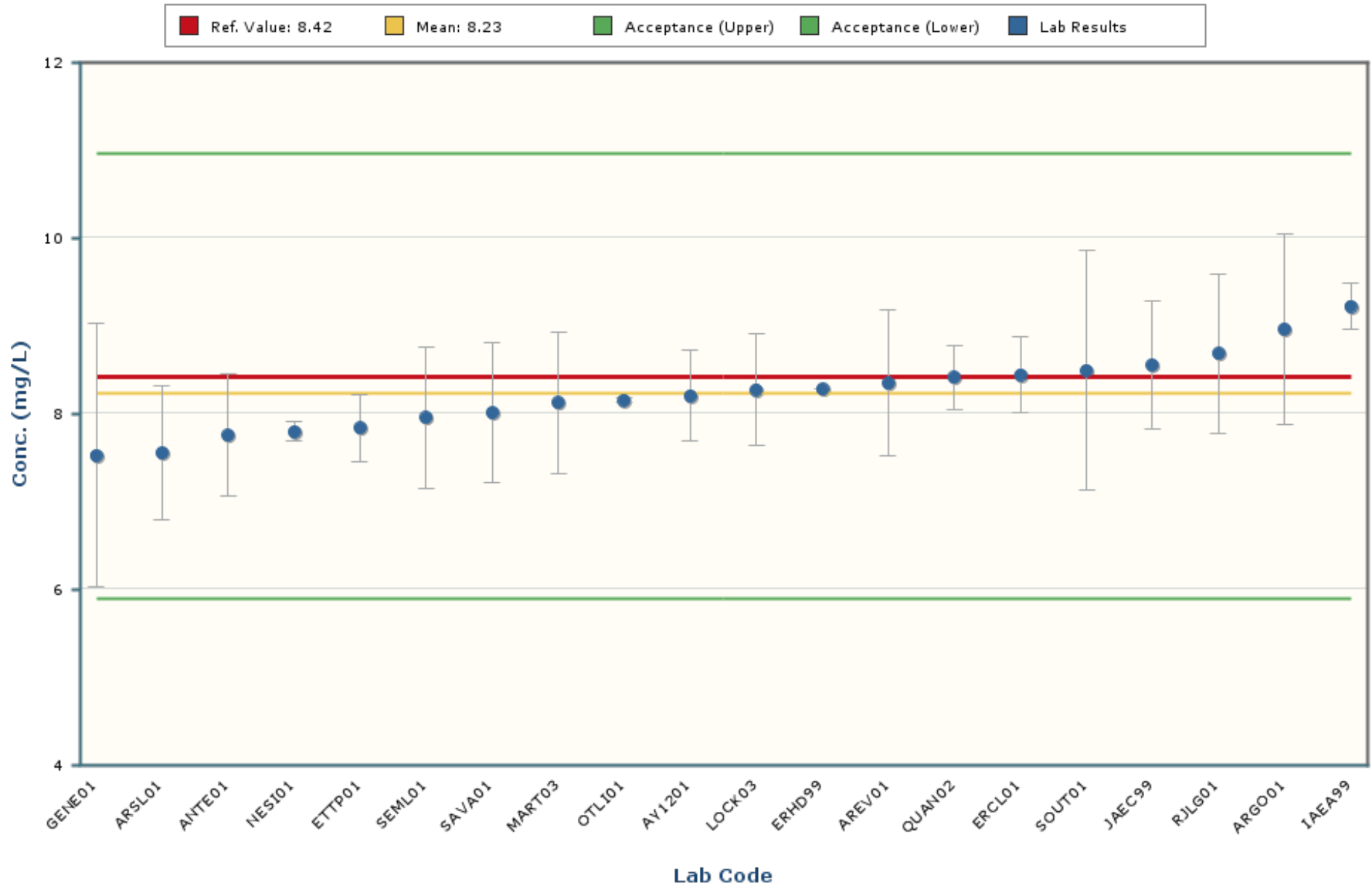
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 7.4 and 12.5 ( $\pm 5$  Standard Deviations).

The error bars encompassing each result are plotted at  $\pm$  one standard deviation.

# Zinc

## MAPEP-21-MaW45



### Notes:

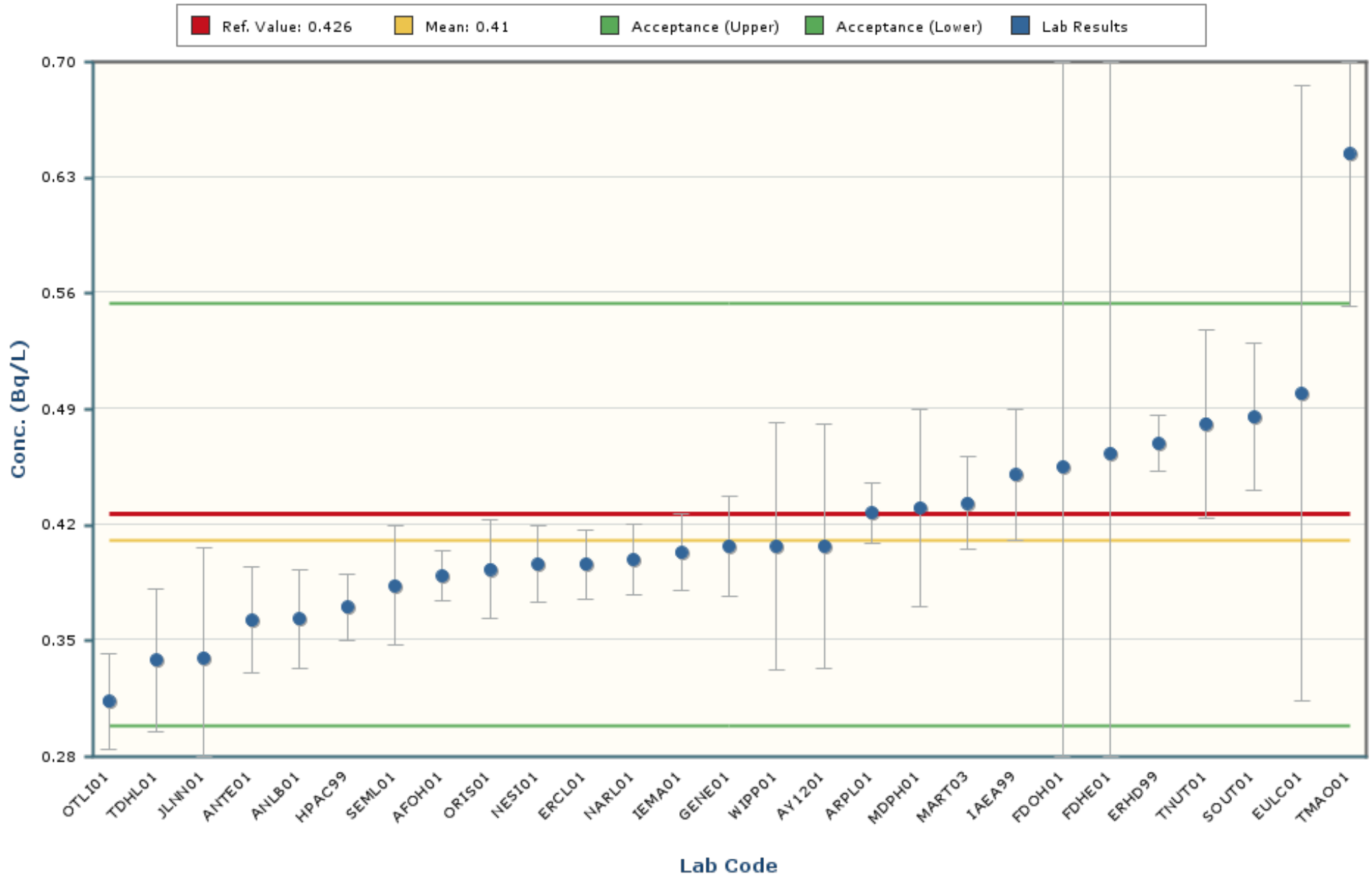
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 6.03 and 10.42 ( $\pm 5$  Standard Deviations).

The error bars encompassing each result are plotted at  $\pm 1$  standard deviation.

# Americium-241

## MAPEP-21-MaW45



### Notes:

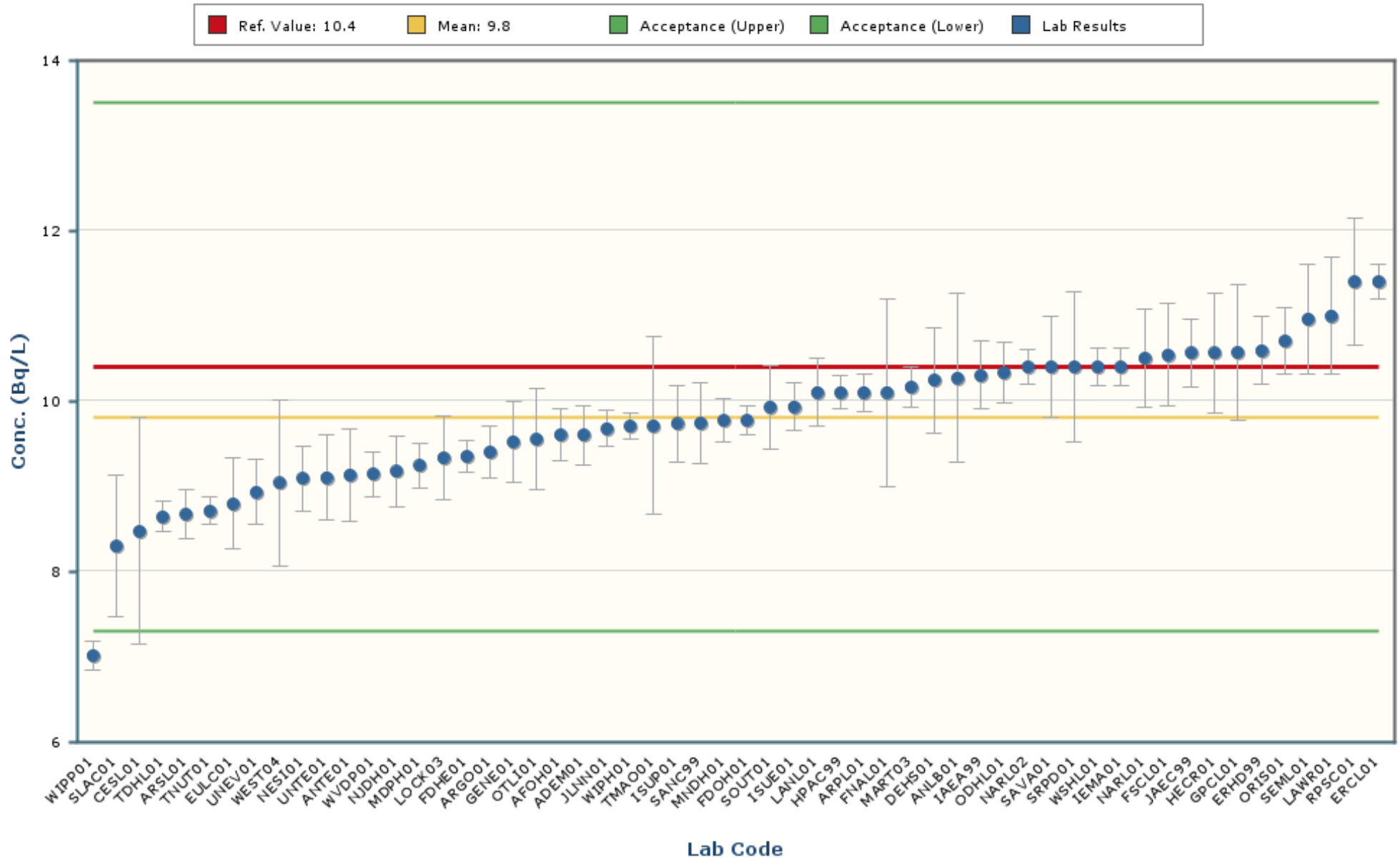
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 0.170 and 0.650 ( $\pm 5$  Standard Deviations).

The error bars encompassing each result are plotted at  $\pm 1$  standard deviation.

# Cesium-134

MAPEP-21-MaW45



## Notes:

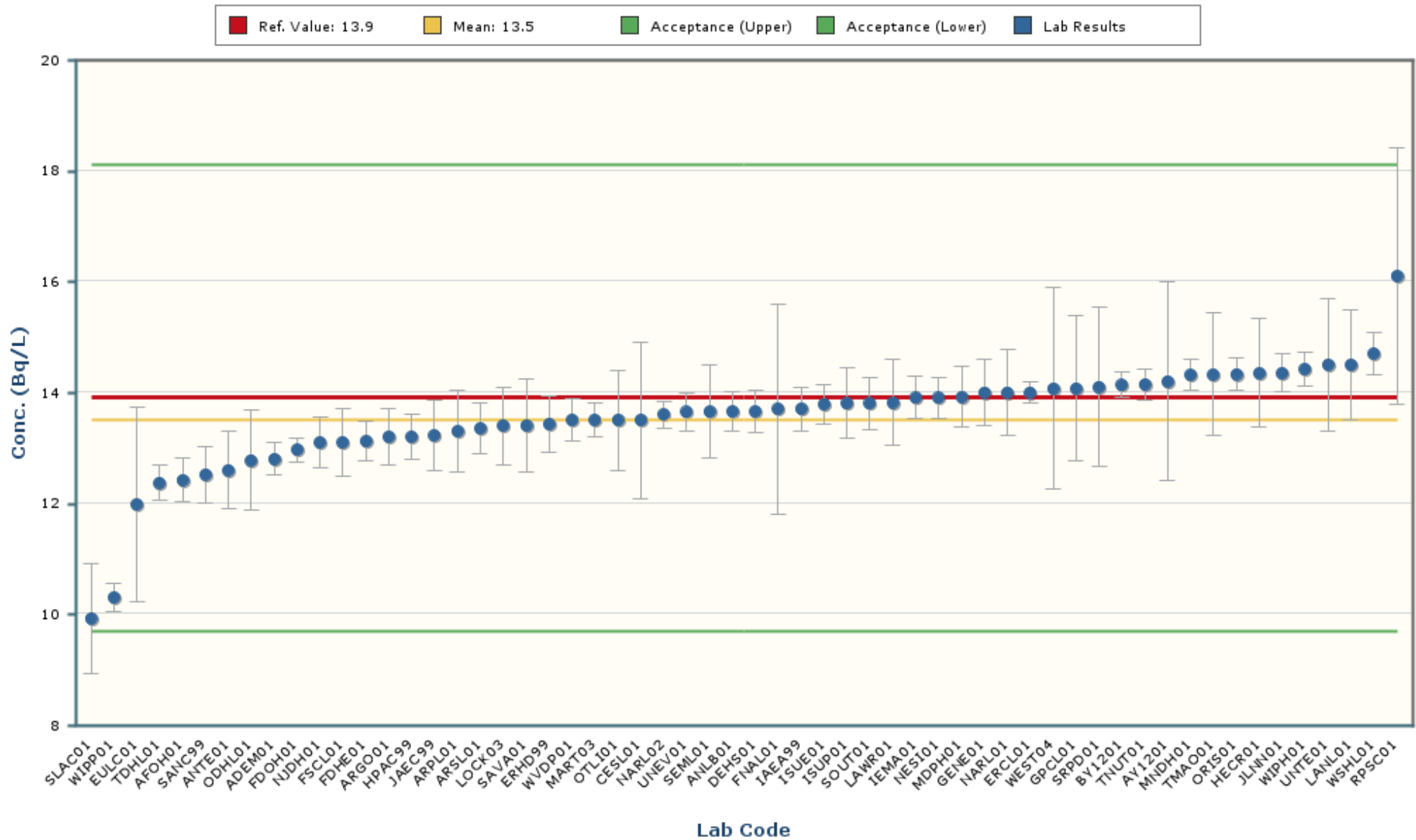
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 6.2 and 13.5 ( $\pm 5$  Standard Deviations).

The error bars encompassing each result are plotted at  $\pm$  one standard deviation.

# Cobalt-57

## MAPEP-21-MaW45



### Notes:

The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

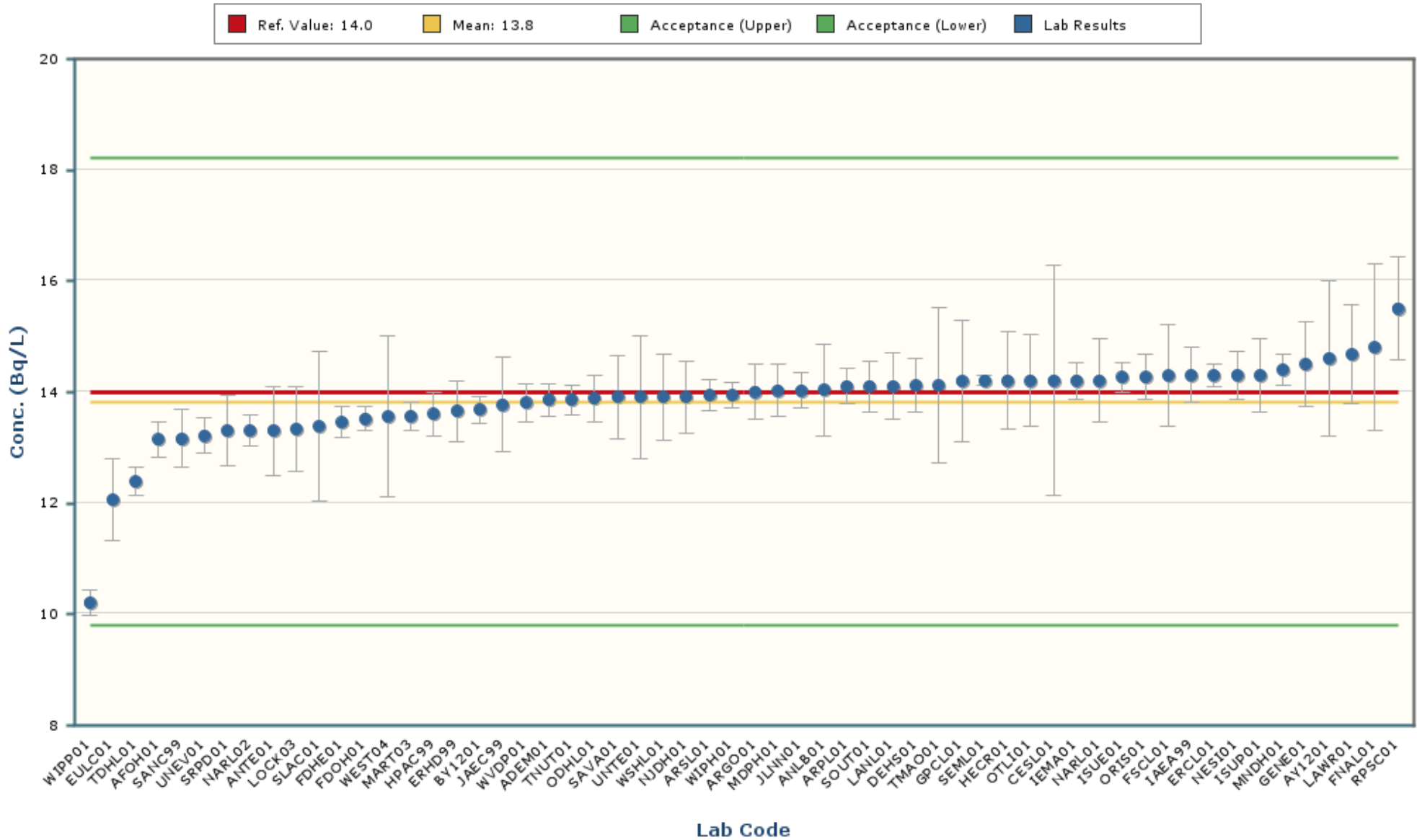
The chart shows only data points with values between 8.9 and 18.2 ( $\pm 5$  Standard Deviations).

The error bars encompassing each result are plotted at  $\pm$  one standard deviation.



# Cobalt-60

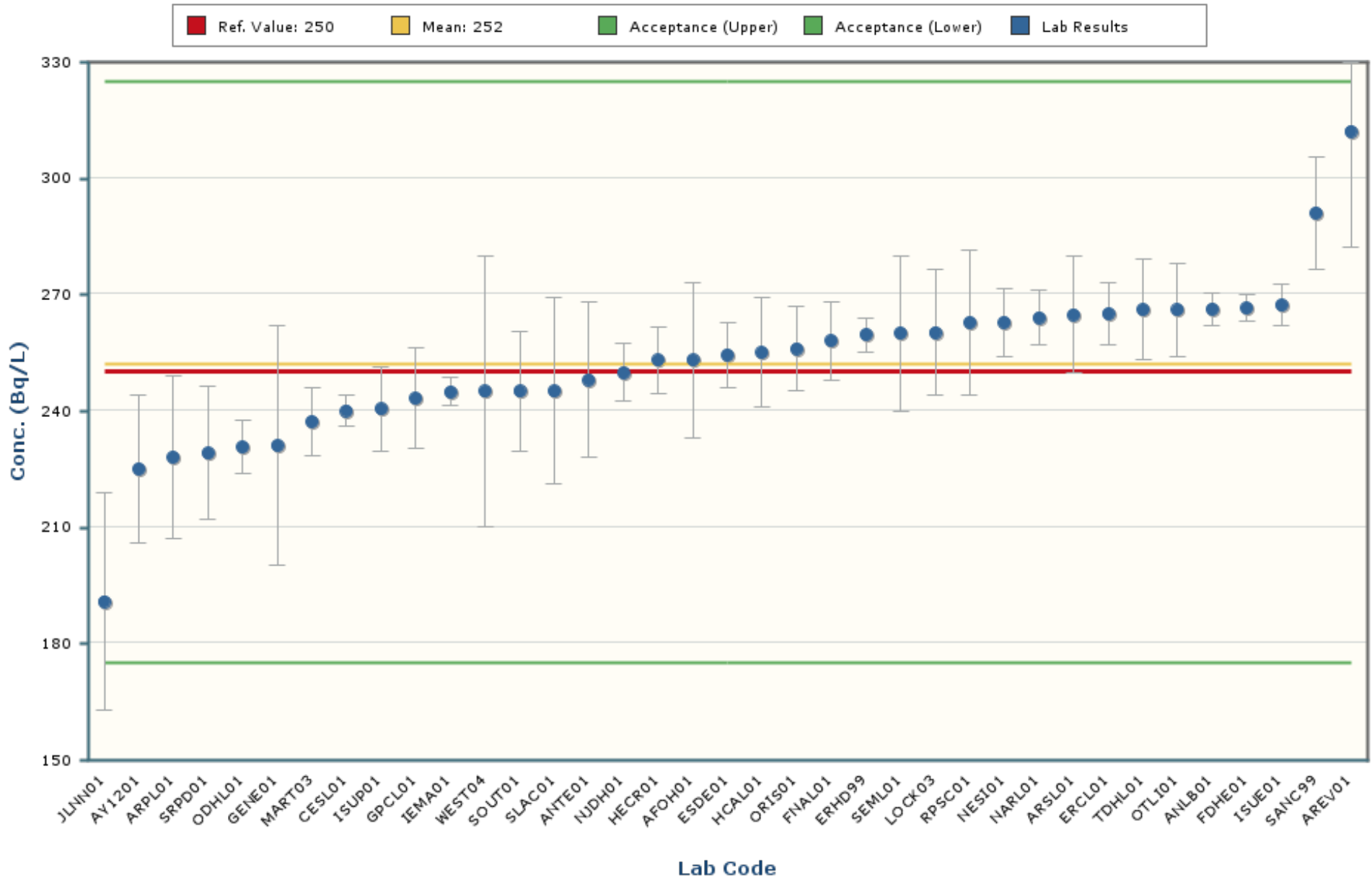
## MAPEP-21-MaW45



Notes:  
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .  
The chart shows only data points with values between 10.2 and 17.5 ( $\pm 5$  Standard Deviations).  
The error bars encompassing each result are plotted at  $\pm$  one standard deviation.

# Hydrogen-3

MAPEP-21-MaW45



## Notes:

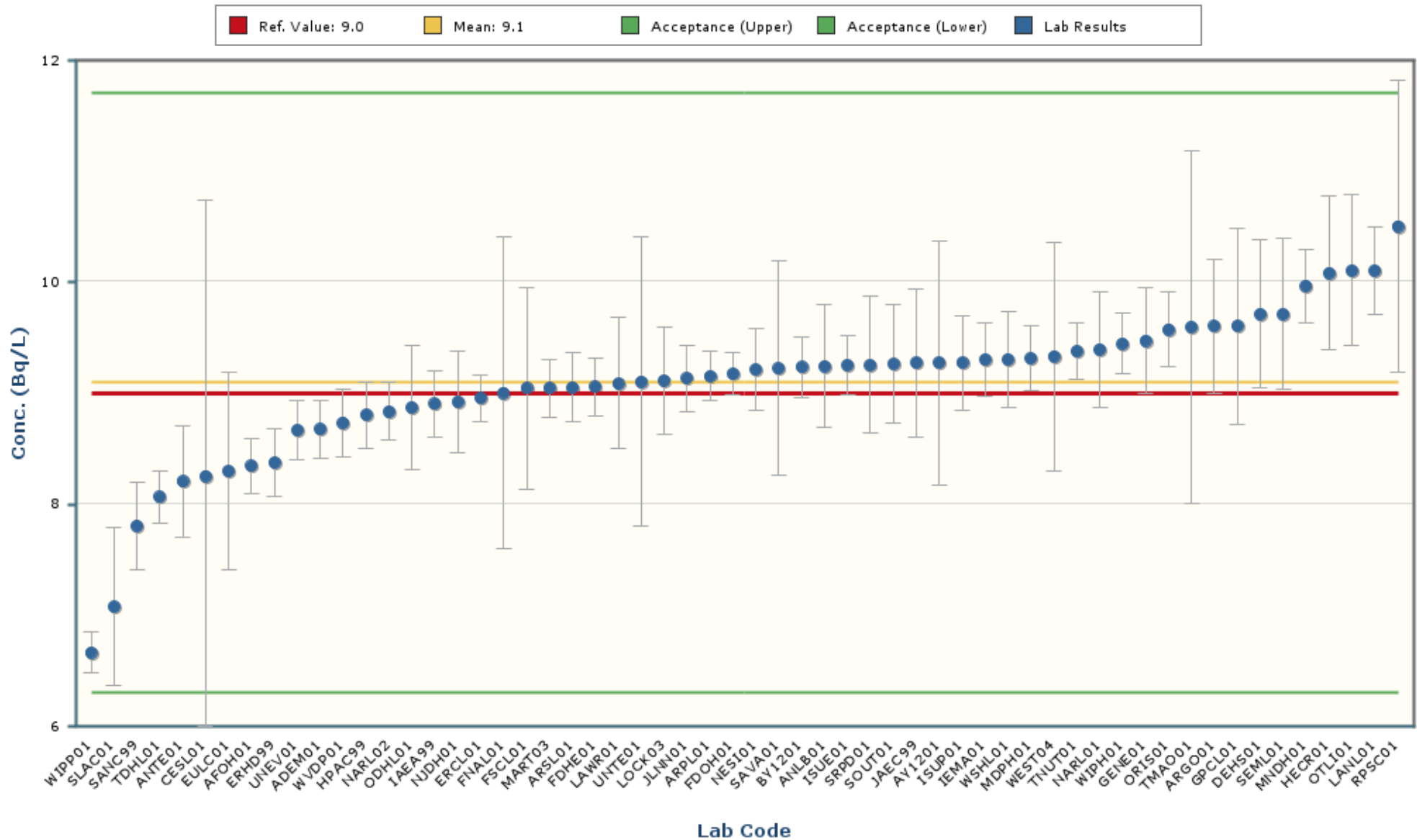
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 152 and 352 ( $\pm 5$  Standard Deviations).

The error bars encompassing each result are plotted at  $\pm$  one standard deviation.

# Manganese-54

MAPEP-21-MaW45



Notes:

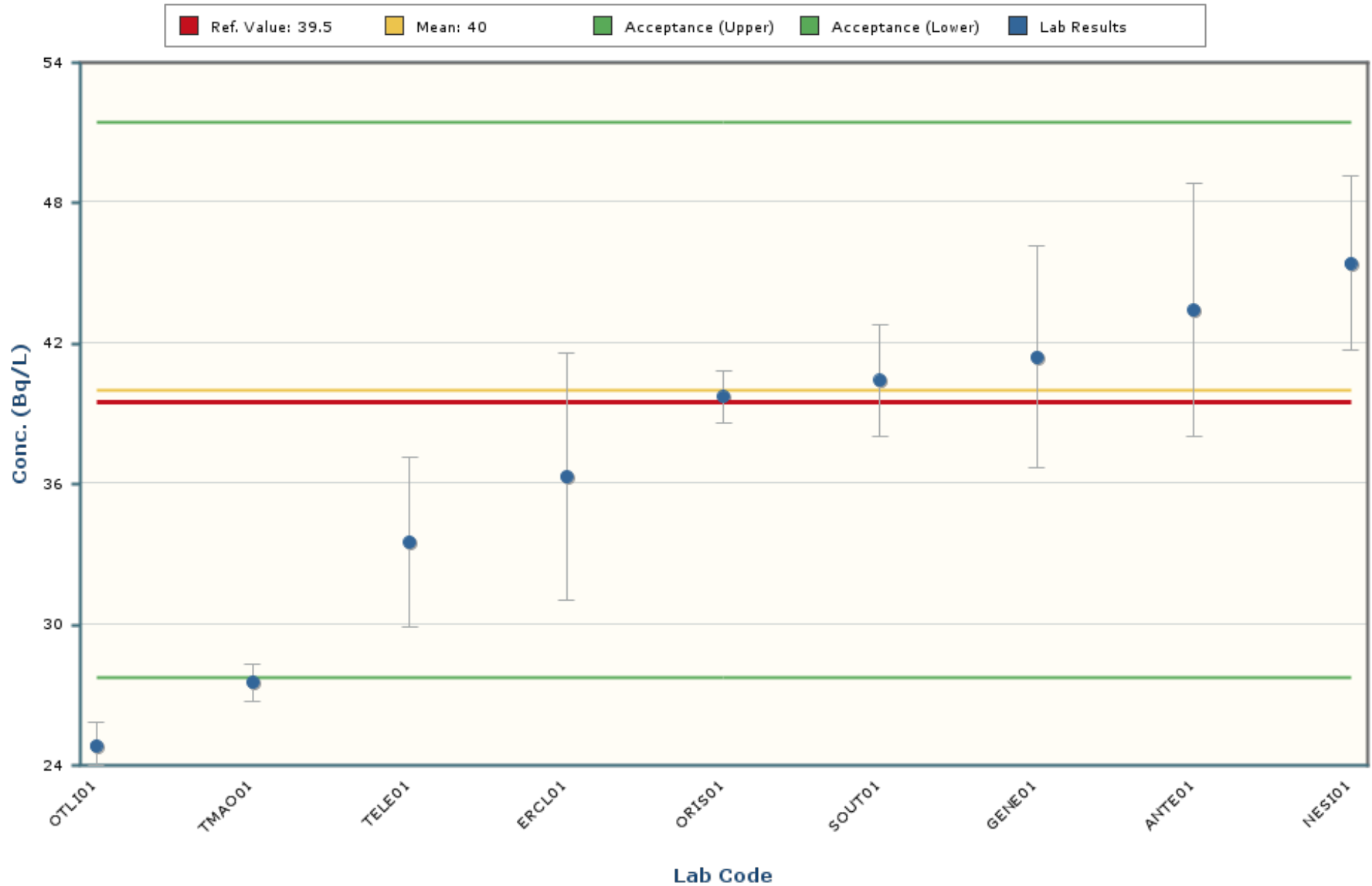
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 5.8 and 12.4 ( $\pm 5$  Standard Deviations).

The error bars encompassing each result are plotted at  $\pm 1$  standard deviation.

# Nickel-63

## MAPEP-21-MaW45



### Notes:

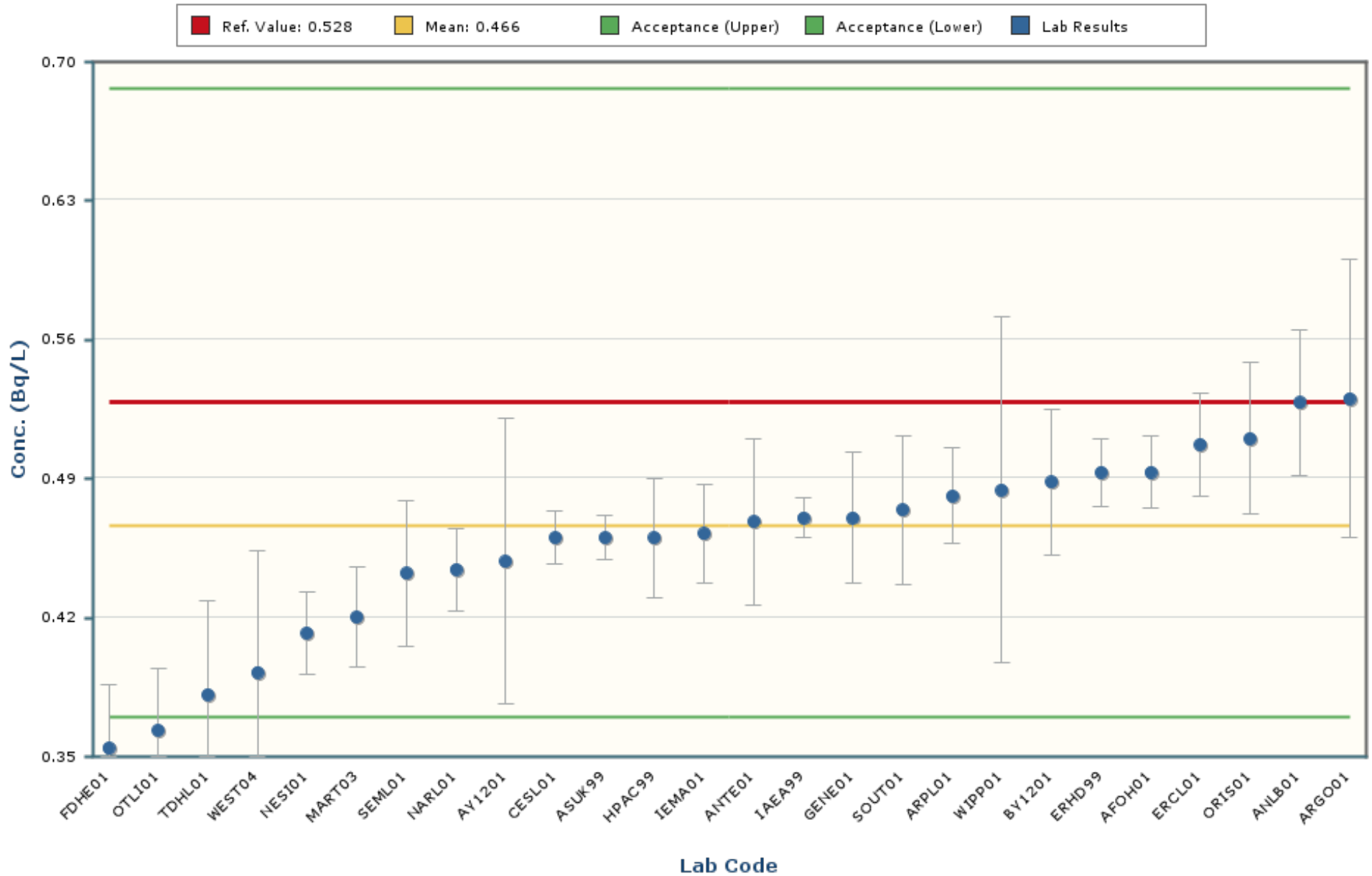
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 19.7 and 60.3 ( $\pm 5$  Standard Deviations).

The error bars encompassing each result are plotted at  $\pm$  one standard deviation.

# Plutonium-239/240

## MAPEP-21-MaW45



### Notes:

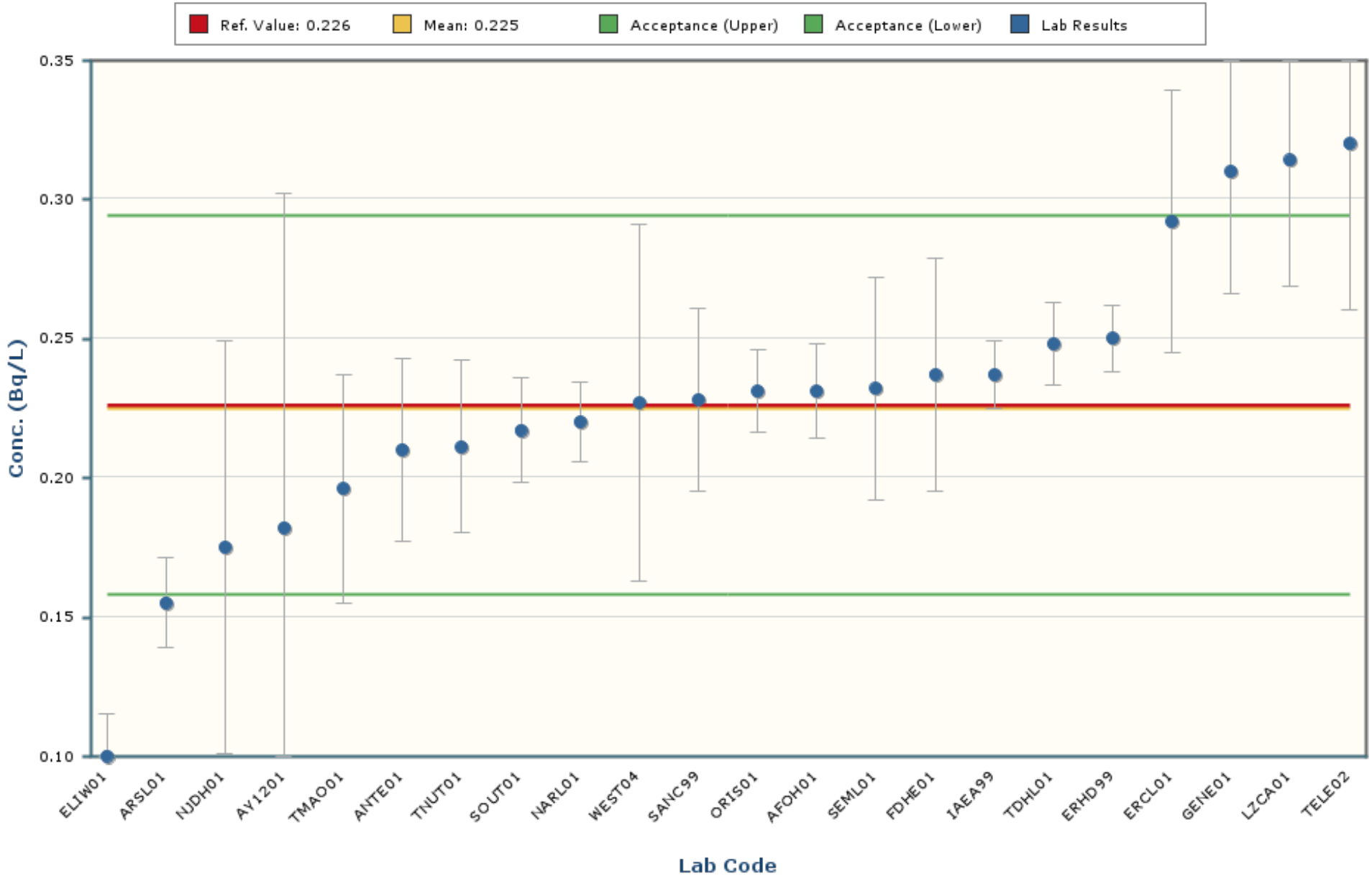
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 0.275 and 0.656 ( $\pm 5$  Standard Deviations).

The error bars encompassing each result are plotted at  $\pm$  one standard deviation.

# Radium-226

## MAPEP-21-MaW45



### Notes:

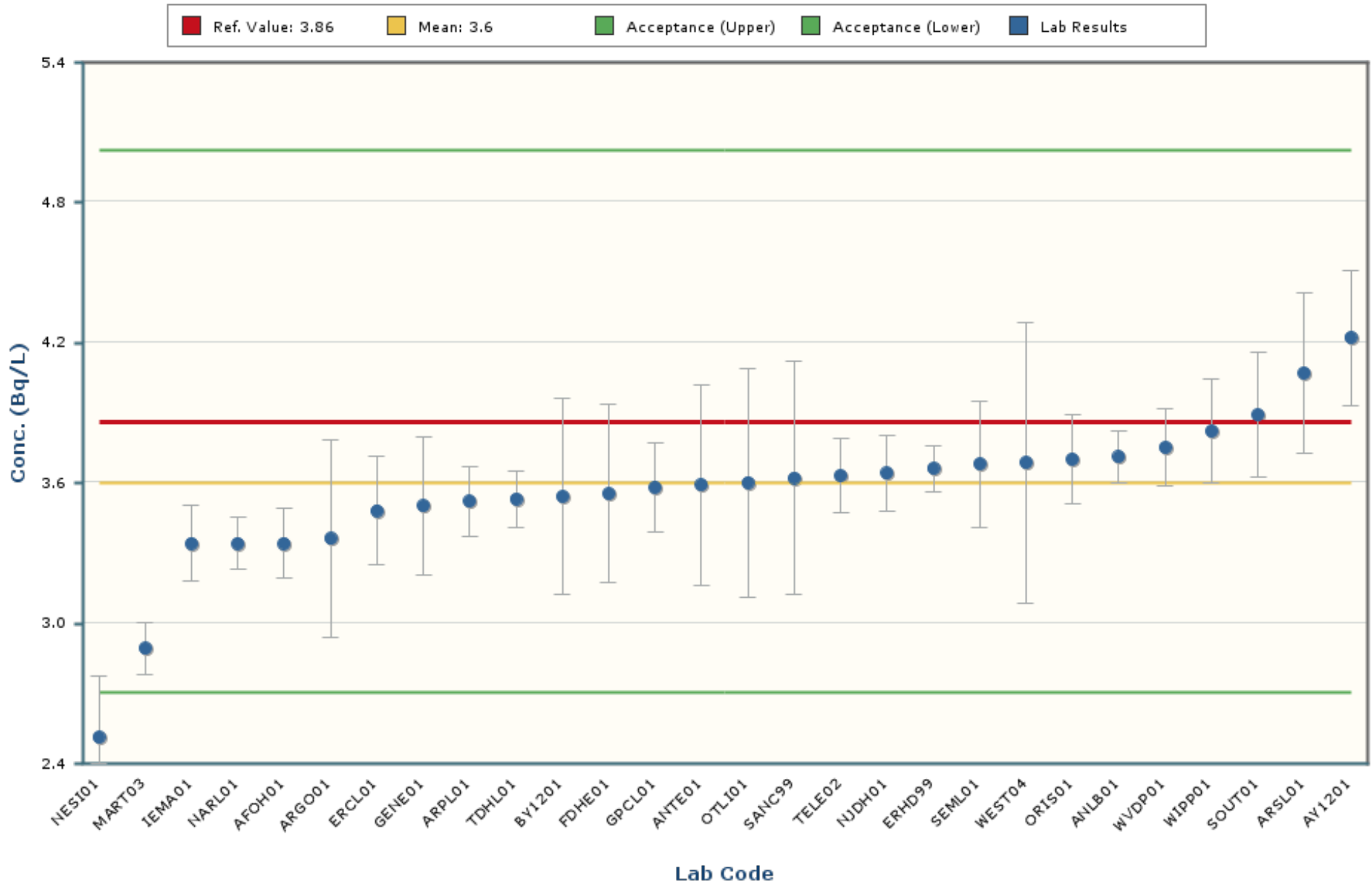
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 0.089 and 0.361 ( $\pm 5$  Standard Deviations).

The error bars encompassing each result are plotted at  $\pm$  one standard deviation.

# Strontium-90

MAPEP-21-MaW45



## Notes:

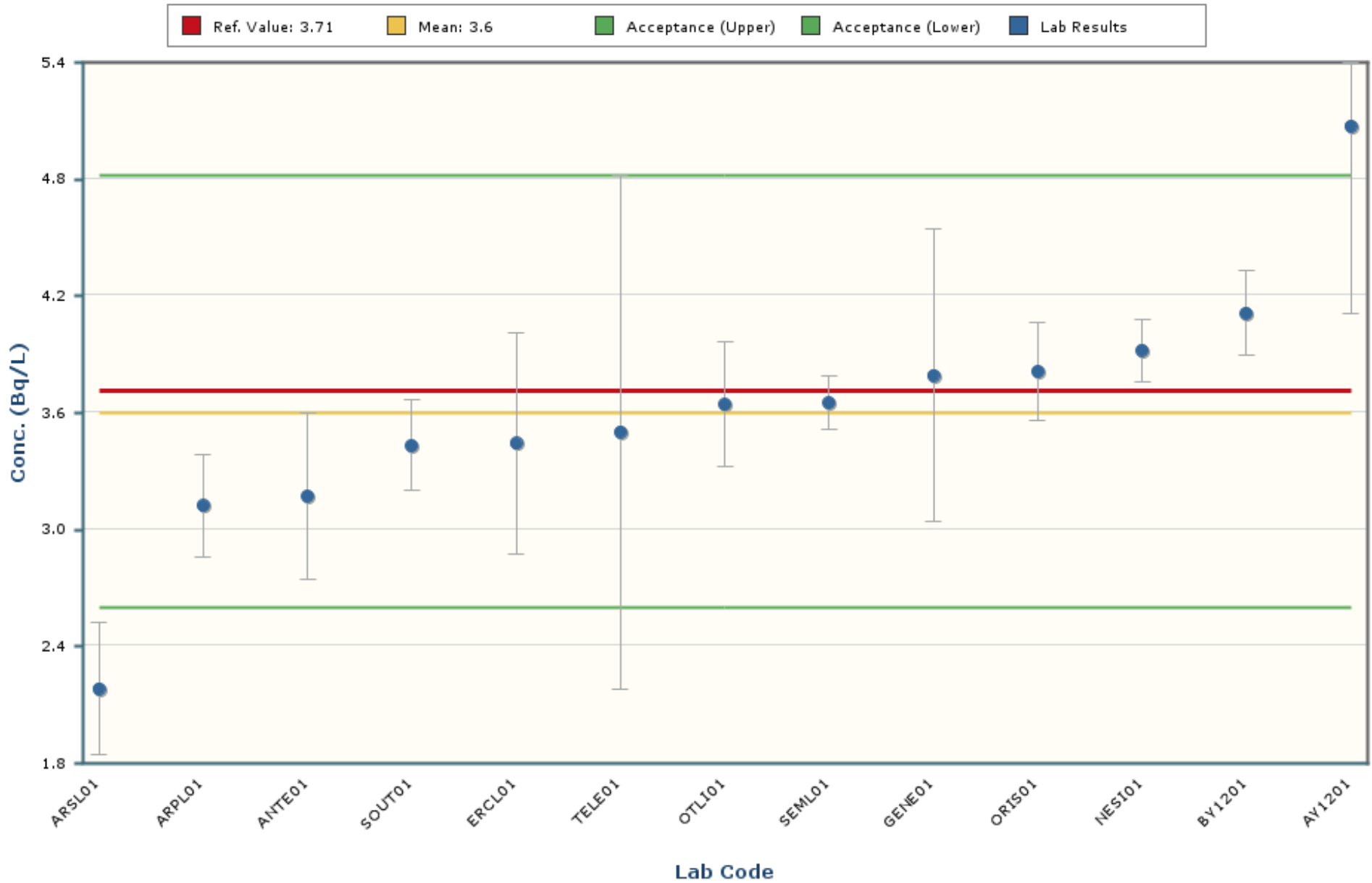
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 2.36 and 4.84 ( $\pm 5$  Standard Deviations).

The error bars encompassing each result are plotted at  $\pm 1$  standard deviation.

# Technetium-99

## MAPEP-21-MaW45



### Notes:

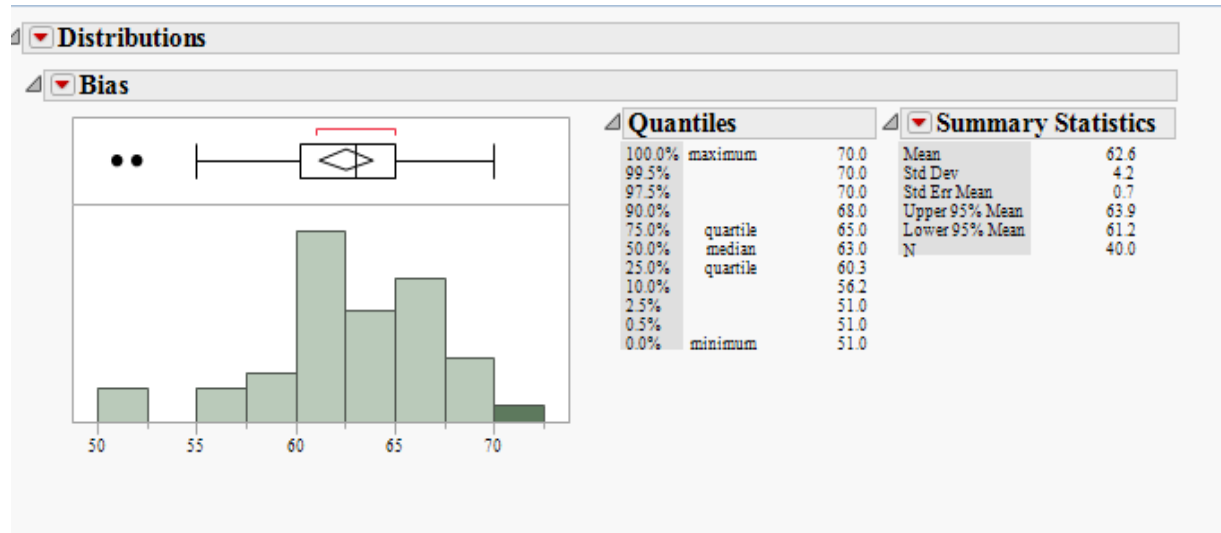
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 2.08 and 5.12 ( $\pm 5$  Standard Deviations).

The error bars encompassing each result are plotted at  $\pm$  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.

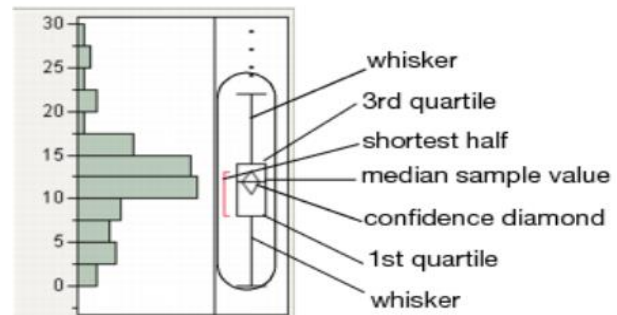


### Outlier Box Plot

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 1<sup>st</sup> and 3<sup>rd</sup> quartile. The difference between the 1<sup>st</sup> and 3<sup>rd</sup> 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)

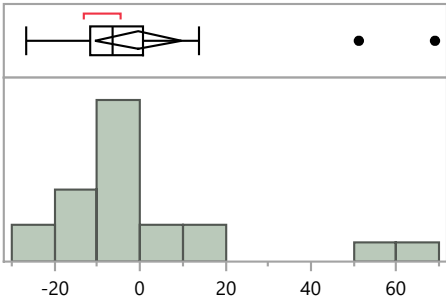


If the data points do not reach the computed ranges, then the whiskers are determined by the upper and lower data point values (not including outliers). The bracket outside of the box identifies the *shortest half*, which is the most dense 50% of the observations (Rousseuw and Leroy 1987).

**MaW Distribution by Detection Method**

**Distributions Analyte\_Detection=Americium-241 Alpha Spectrometry**

**Bias**



**Quantiles**

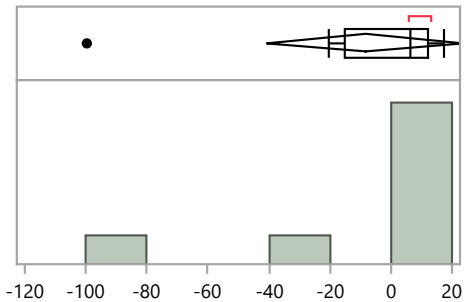
100.0%	maximum	69.0
99.5%		69.0
97.5%		69.0
90.0%		43.7
75.0%	quartile	0.9
50.0%	median	-6.3
25.0%	quartile	-11.6
10.0%		-19.6
2.5%		-26.5
0.5%		-26.5
0.0%	minimum	-26.5

**Summary Statistics**

Mean	-0.5
Std Dev	22.2
Std Err Mean	4.9
Upper 95% Mean	9.7
Lower 95% Mean	-10.6
N	21.0

**Distributions Analyte\_Detection=Americium-241 Gamma Spectrometry**

**Bias**



**Quantiles**

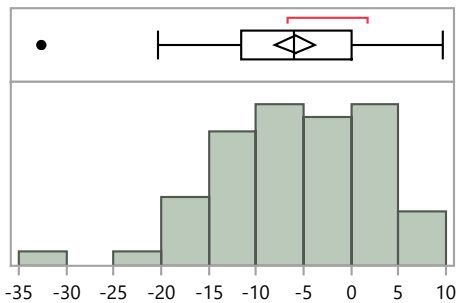
100.0%	maximum	17.1
99.5%		17.1
97.5%		17.1
90.0%		17.1
75.0%	quartile	11.9
50.0%	median	6.2
25.0%	quartile	-15.0
10.0%		-99.6
2.5%		-99.6
0.5%		-99.6
0.0%	minimum	-99.6

**Summary Statistics**

Mean	-8.5
Std Dev	38.5
Std Err Mean	13.6
Upper 95% Mean	23.7
Lower 95% Mean	-40.7
N	8.0

**Distributions Analyte\_Detection=Cesium-134 Gamma Spectrometry**

**Bias**



**Quantiles**

100.0%	maximum	9.6
99.5%		9.6
97.5%		9.6
90.0%		2.1
75.0%	quartile	0.0
50.0%	median	-6.1
25.0%	quartile	-11.7
10.0%		-16.4
2.5%		-27.4
0.5%		-32.6
0.0%	minimum	-32.6

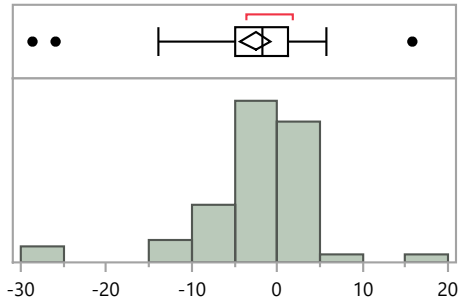
**Summary Statistics**

Mean	-5.9
Std Dev	7.9
Std Err Mean	1.1
Upper 95% Mean	-3.8
Lower 95% Mean	-8.0
N	56.0

**MaW Distribution by Detection Method**

**Distributions Analyte\_Detection=Cobalt-57 Gamma Spectrometry**

**Bias**



**Quantiles**

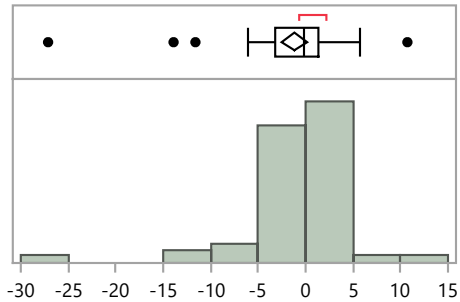
100.0%	maximum	15.8
99.5%		15.8
97.5%		11.0
90.0%		3.3
75.0%	quartile	1.3
50.0%	median	-1.7
25.0%	quartile	-5.0
10.0%		-10.0
2.5%		-27.3
0.5%		-28.6
0.0%	minimum	-28.6

**Summary Statistics**

Mean	-2.5
Std Dev	6.7
Std Err Mean	0.9
Upper 95% Mean	-0.8
Lower 95% Mean	-4.3
N	58.0

**Distributions Analyte\_Detection=Cobalt-60 Gamma Spectrometry**

**Bias**



**Quantiles**

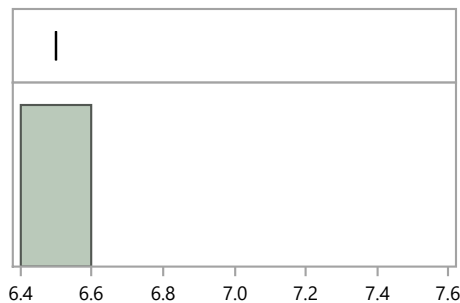
100.0%	maximum	10.7
99.5%		10.7
97.5%		8.3
90.0%		3.0
75.0%	quartile	1.4
50.0%	median	-0.2
25.0%	quartile	-3.1
10.0%		-5.7
2.5%		-20.8
0.5%		-27.1
0.0%	minimum	-27.1

**Summary Statistics**

Mean	-1.1
Std Dev	5.2
Std Err Mean	0.7
Upper 95% Mean	0.2
Lower 95% Mean	-2.5
N	58.0

**Distributions Analyte\_Detection=Hydrogen-3 Gas Flow Proportional Counter**

**Bias**



**Quantiles**

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

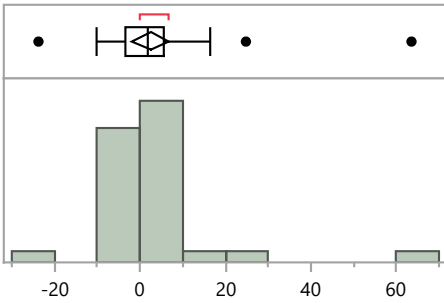
**Summary Statistics**

Mean	6.5
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

**MaW Distribution by Detection Method**

**Distributions Analyte\_Detection=Hydrogen-3 Liquid Scintillation Counter**

**Bias**



**Quantiles**

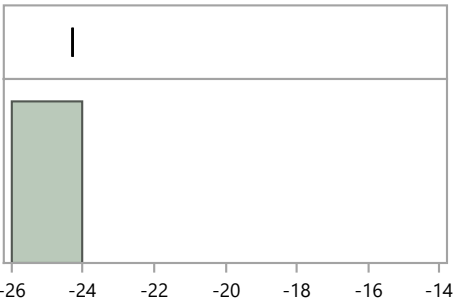
100.0%	maximum	63.5
99.5%		63.5
97.5%		63.5
90.0%		8.8
75.0%	quartile	5.8
50.0%	median	1.8
25.0%	quartile	-3.3
10.0%		-8.5
2.5%		-23.7
0.5%		-23.7
0.0%	minimum	-23.7

**Summary Statistics**

Mean	2.5
Std Dev	13.0
Std Err Mean	2.1
Upper 95% Mean	6.8
Lower 95% Mean	-1.9
N	37.0

**Distributions Analyte\_Detection=Iron-55 Gamma Spectrometry**

**Bias**



**Quantiles**

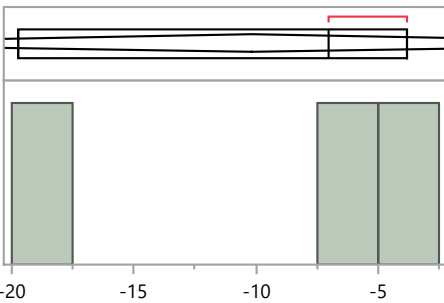
100.0%	maximum	-24.3
99.5%		-24.3
97.5%		-24.3
90.0%		-24.3
75.0%	quartile	-24.3
50.0%	median	-24.3
25.0%	quartile	-24.3
10.0%		-24.3
2.5%		-24.3
0.5%		-24.3
0.0%	minimum	-24.3

**Summary Statistics**

Mean	-24.3
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

**Distributions Analyte\_Detection=Iron-55 Liquid Scintillation Counter**

**Bias**



**Quantiles**

100.0%	maximum	-3.8
99.5%		-3.8
97.5%		-3.8
90.0%		-3.8
75.0%	quartile	-3.8
50.0%	median	-7.0
25.0%	quartile	-19.7
10.0%		-19.7
2.5%		-19.7
0.5%		-19.7
0.0%	minimum	-19.7

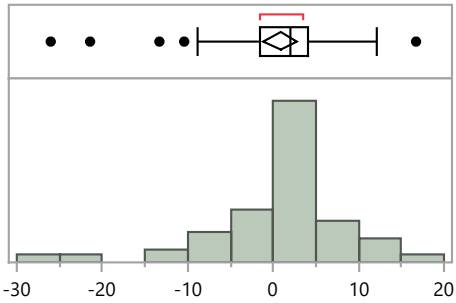
**Summary Statistics**

Mean	-10.2
Std Dev	8.4
Std Err Mean	4.9
Upper 95% Mean	10.7
Lower 95% Mean	-31.1
N	3.0

**MaW Distribution by Detection Method**

**Distributions Analyte\_Detection=Manganese-54 Gamma Spectrometry**

**Bias**



**Quantiles**

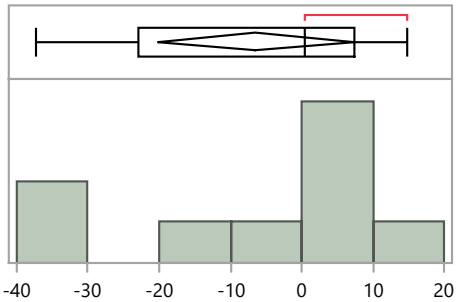
100.0%	maximum	16.7
99.5%		16.7
97.5%		14.6
90.0%		8.2
75.0%	quartile	4.2
50.0%	median	2.1
25.0%	quartile	-1.6
10.0%		-8.4
2.5%		-23.8
0.5%		-26.0
0.0%	minimum	-26.0

**Summary Statistics**

Mean	0.8
Std Dev	7.4
Std Err Mean	1.0
Upper 95% Mean	2.7
Lower 95% Mean	-1.1
N	58.0

**Distributions Analyte\_Detection=Nickel-63 Liquid Scintillation Counter**

**Bias**



**Quantiles**

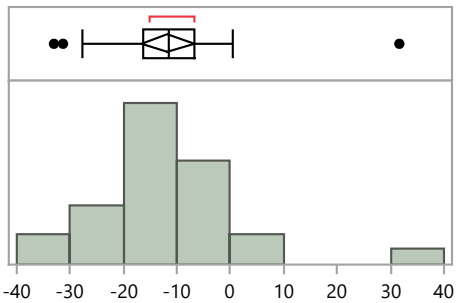
100.0%	maximum	14.9
99.5%		14.9
97.5%		14.9
90.0%		14.9
75.0%	quartile	7.4
50.0%	median	0.5
25.0%	quartile	-22.8
10.0%		-37.2
2.5%		-37.2
0.5%		-37.2
0.0%	minimum	-37.2

**Summary Statistics**

Mean	-6.5
Std Dev	17.9
Std Err Mean	6.0
Upper 95% Mean	7.3
Lower 95% Mean	-20.3
N	9.0

**Distributions Analyte\_Detection=Plutonium-239/240 Alpha Spectrometry**

**Bias**



**Quantiles**

100.0%	maximum	31.6
99.5%		31.6
97.5%		31.6
90.0%		0.1
75.0%	quartile	-6.6
50.0%	median	-11.4
25.0%	quartile	-16.3
10.0%		-28.5
2.5%		-33.0
0.5%		-33.0
0.0%	minimum	-33.0

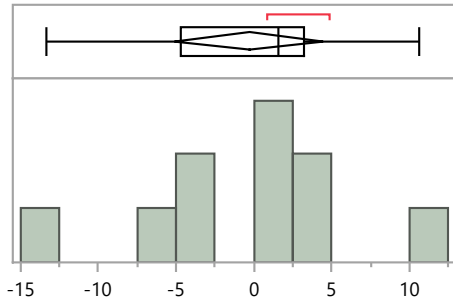
**Summary Statistics**

Mean	-11.7
Std Dev	12.3
Std Err Mean	2.4
Upper 95% Mean	-6.8
Lower 95% Mean	-16.6
N	27.0

**MaW Distribution by Detection Method**

**Distributions Analyte\_Detection=Radium-226 Alpha Spectrometry**

**Bias**



**Quantiles**

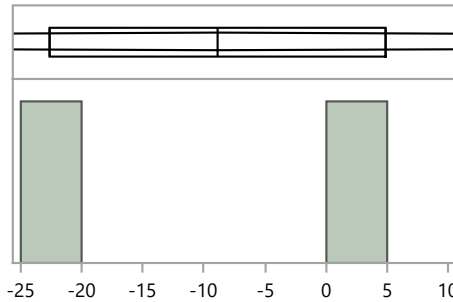
100.0%	maximum	10.6
99.5%		10.6
97.5%		10.6
90.0%		10.0
75.0%	quartile	3.3
50.0%	median	1.6
25.0%	quartile	-4.7
10.0%		-12.6
2.5%		-13.3
0.5%		-13.3
0.0%	minimum	-13.3

**Summary Statistics**

Mean	-0.3
Std Dev	6.6
Std Err Mean	2.1
Upper 95% Mean	4.4
Lower 95% Mean	-5.1
N	10.0

**Distributions Analyte\_Detection=Radium-226 Gamma Spectrometry**

**Bias**



**Quantiles**

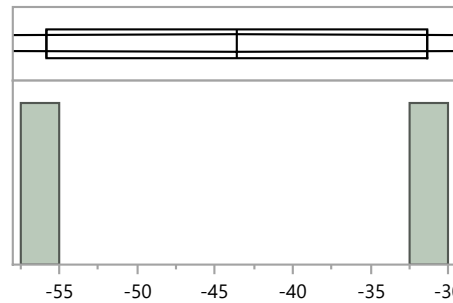
100.0%	maximum	4.9
99.5%		4.9
97.5%		4.9
90.0%		4.9
75.0%	quartile	4.9
50.0%	median	-8.9
25.0%	quartile	-22.6
10.0%		-22.6
2.5%		-22.6
0.5%		-22.6
0.0%	minimum	-22.6

**Summary Statistics**

Mean	-8.9
Std Dev	19.4
Std Err Mean	13.8
Upper 95% Mean	165.9
Lower 95% Mean	-183.6
N	2.0

**Distributions Analyte\_Detection=Radium-226 Gas Flow Proportional Counter**

**Bias**



**Quantiles**

100.0%	maximum	-31.4
99.5%		-31.4
97.5%		-31.4
90.0%		-31.4
75.0%	quartile	-31.4
50.0%	median	-43.6
25.0%	quartile	-55.8
10.0%		-55.8
2.5%		-55.8
0.5%		-55.8
0.0%	minimum	-55.8

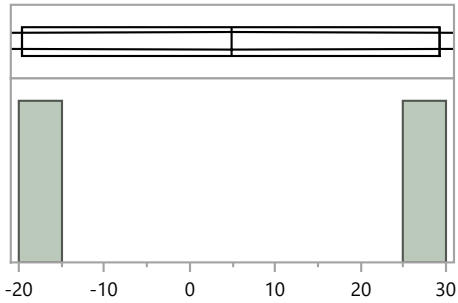
**Summary Statistics**

Mean	-43.6
Std Dev	17.3
Std Err Mean	12.2
Upper 95% Mean	111.4
Lower 95% Mean	-198.6
N	2.0

**MaW Distribution by Detection Method**

**Distributions Analyte\_Detection=Radium-226 Gross Alpha/Beta - 2 pi gas flow proportional counter**

**Bias**



**Quantiles**

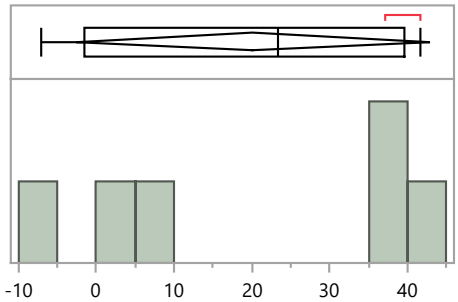
100.0%	maximum	29.2
99.5%		29.2
97.5%		29.2
90.0%		29.2
75.0%	quartile	29.2
50.0%	median	4.9
25.0%	quartile	-19.5
10.0%		-19.5
2.5%		-19.5
0.5%		-19.5
0.0%	minimum	-19.5

**Summary Statistics**

Mean	4.9
Std Dev	34.4
Std Err Mean	24.4
Upper 95% Mean	314.2
Lower 95% Mean	-304.5
N	2.0

**Distributions Analyte\_Detection=Radium-226 Other**

**Bias**



**Quantiles**

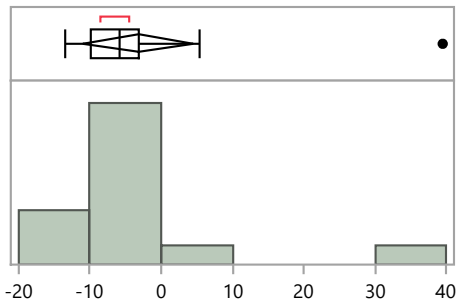
100.0%	maximum	41.6
99.5%		41.6
97.5%		41.6
90.0%		41.6
75.0%	quartile	39.6
50.0%	median	23.5
25.0%	quartile	-1.5
10.0%		-7.1
2.5%		-7.1
0.5%		-7.1
0.0%	minimum	-7.1

**Summary Statistics**

Mean	20.1
Std Dev	21.7
Std Err Mean	8.8
Upper 95% Mean	42.8
Lower 95% Mean	-2.6
N	6.0

**Distributions Analyte\_Detection=Strontium-90 Gas Flow Proportional Counter**

**Bias**



**Quantiles**

100.0%	maximum	39.5
99.5%		39.5
97.5%		39.5
90.0%		22.5
75.0%	quartile	-3.2
50.0%	median	-5.9
25.0%	quartile	-9.8
10.0%		-13.5
2.5%		-13.5
0.5%		-13.5
0.0%	minimum	-13.5

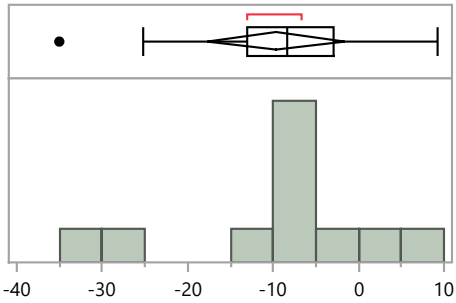
**Summary Statistics**

Mean	-3.2
Std Dev	13.3
Std Err Mean	3.6
Upper 95% Mean	4.5
Lower 95% Mean	-10.9
N	14.0

**MaW Distribution by Detection Method**

**Distributions Analyte\_Detection=Strontium-90 Gross Alpha/Beta - 2 pi gas flow proportional counter**

**Bias**



**Quantiles**

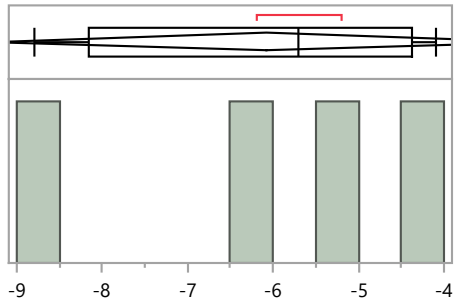
100.0%	maximum	9.3
99.5%		9.3
97.5%		9.3
90.0%		7.6
75.0%	quartile	-2.9
50.0%	median	-8.3
25.0%	quartile	-13.0
10.0%		-33.0
2.5%		-35.0
0.5%		-35.0
0.0%	minimum	-35.0

**Summary Statistics**

Mean	-9.7
Std Dev	11.9
Std Err Mean	3.6
Upper 95% Mean	-1.7
Lower 95% Mean	-17.7
N	11.0

**Distributions Analyte\_Detection=Strontium-90 Liquid Scintillation Counter**

**Bias**



**Quantiles**

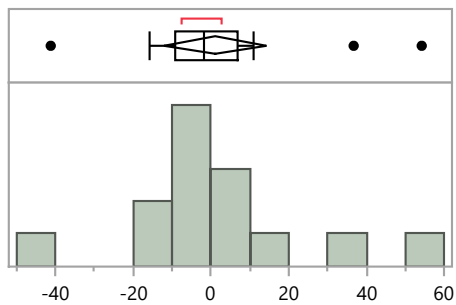
100.0%	maximum	-4.1
99.5%		-4.1
97.5%		-4.1
90.0%		-4.1
75.0%	quartile	-4.4
50.0%	median	-5.7
25.0%	quartile	-8.2
10.0%		-8.8
2.5%		-8.8
0.5%		-8.8
0.0%	minimum	-8.8

**Summary Statistics**

Mean	-6.1
Std Dev	2.0
Std Err Mean	1.0
Upper 95% Mean	-2.9
Lower 95% Mean	-9.3
N	4.0

**Distributions Analyte\_Detection=Technetium-99 Liquid Scintillation Counter**

**Bias**



**Quantiles**

100.0%	maximum	54.2
99.5%		54.2
97.5%		54.2
90.0%		45.5
75.0%	quartile	7.0
50.0%	median	-1.8
25.0%	quartile	-9.3
10.0%		-28.6
2.5%		-41.2
0.5%		-41.2
0.0%	minimum	-41.2

**Summary Statistics**

Mean	1.2
Std Dev	22.8
Std Err Mean	6.1
Upper 95% Mean	14.3
Lower 95% Mean	-12.0
N	14.0

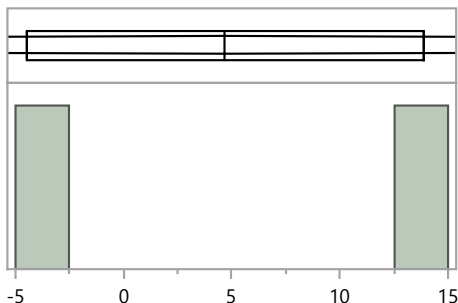


MaW45 Distribution by Preparation Method

**MaW Distribution by Prep Method**

**Distributions Analyte\_Method=Americium-241 Acid dissolution with hydrofluoric acid**

**Bias**



**Quantiles**

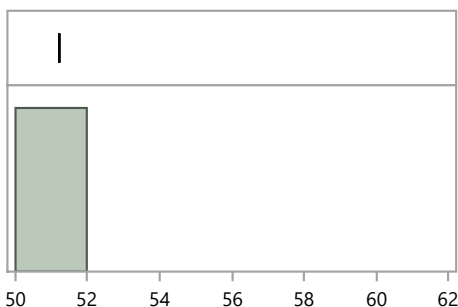
Quantile	Value
100.0% maximum	13.9
99.5%	13.9
97.5%	13.9
90.0%	13.9
75.0% quartile	13.9
50.0% median	4.7
25.0% quartile	-4.5
10.0%	-4.5
2.5%	-4.5
0.5%	-4.5
0.0% minimum	-4.5

**Summary Statistics**

Mean	4.7
Std Dev	13.0
Std Err Mean	9.2
Upper 95% Mean	121.6
Lower 95% Mean	-112.2
N	2.0

**Distributions Analyte\_Method=Americium-241 Coprecipitation, acidified**

**Bias**



**Quantiles**

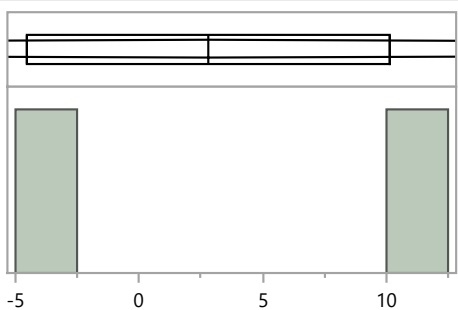
Quantile	Value
100.0% maximum	51.2
99.5%	51.2
97.5%	51.2
90.0%	51.2
75.0% quartile	51.2
50.0% median	51.2
25.0% quartile	51.2
10.0%	51.2
2.5%	51.2
0.5%	51.2
0.0% minimum	51.2

**Summary Statistics**

Mean	51.2
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

**Distributions Analyte\_Method=Americium-241 Coprecipitation, straight**

**Bias**



**Quantiles**

Quantile	Value
100.0% maximum	10.1
99.5%	10.1
97.5%	10.1
90.0%	10.1
75.0% quartile	10.1
50.0% median	2.8
25.0% quartile	-4.5
10.0%	-4.5
2.5%	-4.5
0.5%	-4.5
0.0% minimum	-4.5

**Summary Statistics**

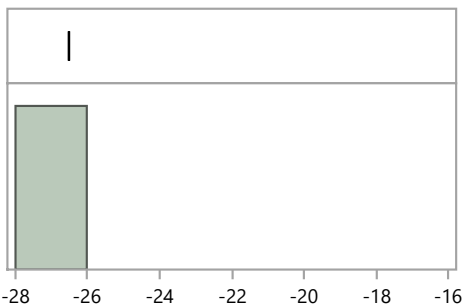
Mean	2.8
Std Dev	10.3
Std Err Mean	7.3
Upper 95% Mean	95.6
Lower 95% Mean	-90.0
N	2.0

MaW45 Distribution by Preparation Method

**MaW Distribution by Prep Method**

**Distributions Analyte\_Method=Americium-241 EPA 907, Actinide Elements, 600/4/80-032**

**Bias**



**Quantiles**

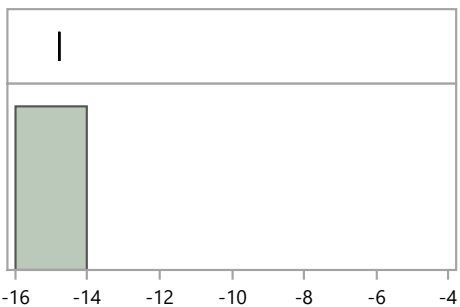
100.0%	maximum	-26.5
99.5%		-26.5
97.5%		-26.5
90.0%		-26.5
75.0%	quartile	-26.5
50.0%	median	-26.5
25.0%	quartile	-26.5
10.0%		-26.5
2.5%		-26.5
0.5%		-26.5
0.0%	minimum	-26.5

**Summary Statistics**

Mean	-26.5
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

**Distributions Analyte\_Method=Americium-241 Evaporation, straight**

**Bias**



**Quantiles**

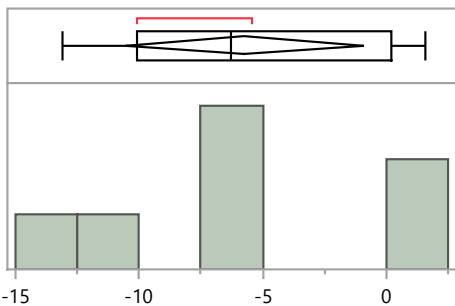
100.0%	maximum	-14.8
99.5%		-14.8
97.5%		-14.8
90.0%		-14.8
75.0%	quartile	-14.8
50.0%	median	-14.8
25.0%	quartile	-14.8
10.0%		-14.8
2.5%		-14.8
0.5%		-14.8
0.0%	minimum	-14.8

**Summary Statistics**

Mean	-14.8
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

**Distributions Analyte\_Method=Americium-241 Ion Exchange Chromatography / Ion Chromatography**

**Bias**



**Quantiles**

100.0%	maximum	1.6
99.5%		1.6
97.5%		1.6
90.0%		1.6
75.0%	quartile	0.2
50.0%	median	-6.3
25.0%	quartile	-10.1
10.0%		-13.1
2.5%		-13.1
0.5%		-13.1
0.0%	minimum	-13.1

**Summary Statistics**

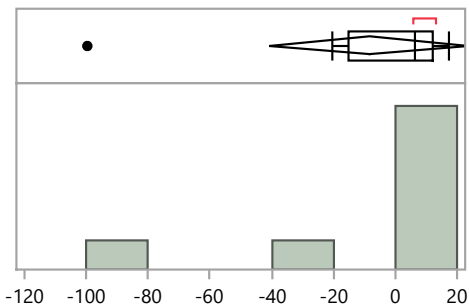
Mean	-5.7
Std Dev	5.2
Std Err Mean	2.0
Upper 95% Mean	-0.9
Lower 95% Mean	-10.6
N	7.0

MaW45 Distribution by Preparation Method

**MaW Distribution by Prep Method**

**Distributions Analyte\_Method=Americium-241 No preparation - analyzed as received**

**Bias**



**Quantiles**

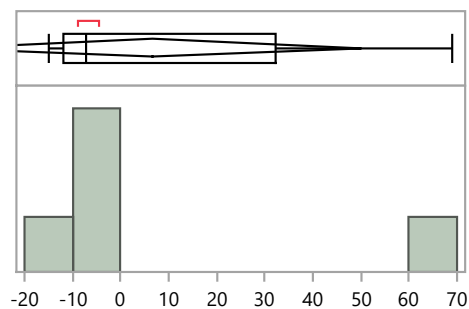
100.0%	maximum	17.1
99.5%		17.1
97.5%		17.1
90.0%		17.1
75.0%	quartile	11.9
50.0%	median	6.2
25.0%	quartile	-15.0
10.0%		-99.6
2.5%		-99.6
0.5%		-99.6
0.0%	minimum	-99.6

**Summary Statistics**

Mean	-8.5
Std Dev	38.5
Std Err Mean	13.6
Upper 95% Mean	23.7
Lower 95% Mean	-40.7
N	8.0

**Distributions Analyte\_Method=Americium-241 Other**

**Bias**



**Quantiles**

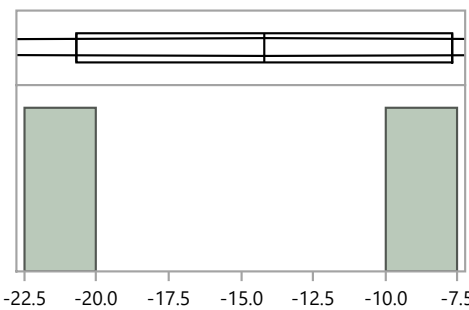
100.0%	maximum	69.0
99.5%		69.0
97.5%		69.0
90.0%		69.0
75.0%	quartile	32.3
50.0%	median	-7.0
25.0%	quartile	-11.9
10.0%		-15.0
2.5%		-15.0
0.5%		-15.0
0.0%	minimum	-15.0

**Summary Statistics**

Mean	6.8
Std Dev	35.0
Std Err Mean	15.7
Upper 95% Mean	50.2
Lower 95% Mean	-36.7
N	5.0

**Distributions Analyte\_Method=Americium-241 Total dissolution by fusion**

**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	-14.2
25.0%	quartile	-20.7
10.0%		-20.7
2.5%		-20.7
0.5%		-20.7
0.0%	minimum	-20.7

**Summary Statistics**

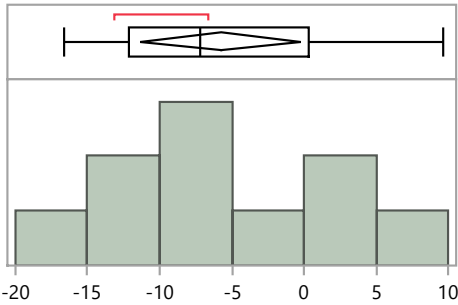
Mean	-14.2
Std Dev	9.2
Std Err Mean	6.5
Upper 95% Mean	68.4
Lower 95% Mean	-96.8
N	2.0

MaW45 Distribution by Preparation Method

**MaW Distribution by Prep Method**

**Distributions Analyte\_Method=Cesium-134 EPA 901.1, Gamma Emitting, 600/4-80-032**

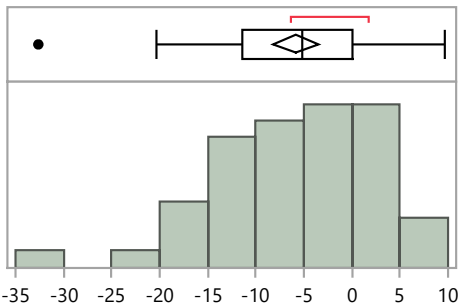
**Bias**



Quantiles			Summary Statistics	
100.0%	maximum	9.6	Mean	-5.7
99.5%		9.6	Std Dev	7.8
97.5%		9.6	Std Err Mean	2.5
90.0%		8.8	Upper 95% Mean	-0.2
75.0%	quartile	0.4	Lower 95% Mean	-11.3
50.0%	median	-7.2	N	10.0
25.0%	quartile	-12.1		
10.0%		-16.3		
2.5%		-16.6		
0.5%		-16.6		
0.0%	minimum	-16.6		

**Distributions Analyte\_Method=Cesium-134 No preparation - analyzed as received**

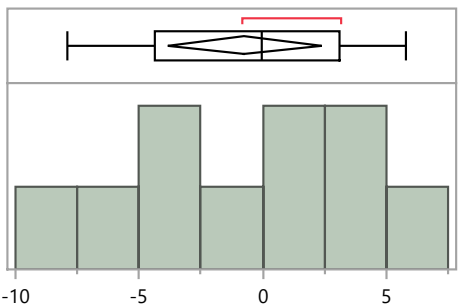
**Bias**



Quantiles			Summary Statistics	
100.0%	maximum	9.6	Mean	-5.9
99.5%		9.6	Std Dev	8.0
97.5%		8.9	Std Err Mean	1.2
90.0%		2.1	Upper 95% Mean	-3.5
75.0%	quartile	0.0	Lower 95% Mean	-8.3
50.0%	median	-5.3	N	46.0
25.0%	quartile	-11.4		
10.0%		-16.5		
2.5%		-30.4		
0.5%		-32.6		
0.0%	minimum	-32.6		

**Distributions Analyte\_Method=Cobalt-57 EPA 901.1, Gamma Emitting, 600/4-80-032**

**Bias**



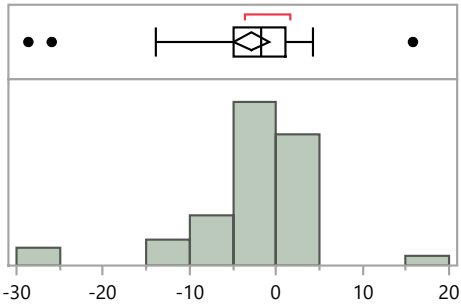
Quantiles			Summary Statistics	
100.0%	maximum	5.8	Mean	-0.7
99.5%		5.8	Std Dev	4.4
97.5%		5.8	Std Err Mean	1.4
90.0%		5.5	Upper 95% Mean	2.4
75.0%	quartile	3.1	Lower 95% Mean	-3.8
50.0%	median	-0.1	N	10.0
25.0%	quartile	-4.4		
10.0%		-7.7		
2.5%		-7.9		
0.5%		-7.9		
0.0%	minimum	-7.9		

MaW45 Distribution by Preparation Method

**MaW Distribution by Prep Method**

**Distributions Analyte\_Method=Cobalt-57 No preparation - analyzed as received**

**Bias**



**Quantiles**

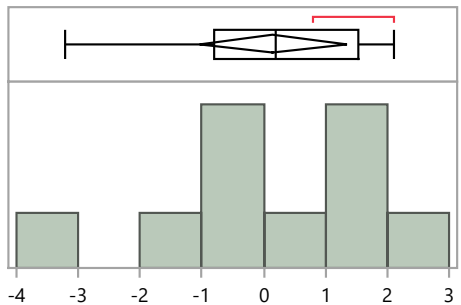
100.0%	maximum	15.8
99.5%		15.8
97.5%		13.2
90.0%		3.3
75.0%	quartile	1.1
50.0%	median	-1.8
25.0%	quartile	-5.0
10.0%		-10.6
2.5%		-28.0
0.5%		-28.6
0.0%	minimum	-28.6

**Summary Statistics**

Mean	-2.9
Std Dev	7.1
Std Err Mean	1.0
Upper 95% Mean	-0.9
Lower 95% Mean	-5.0
N	48.0

**Distributions Analyte\_Method=Cobalt-60 EPA 901.1, Gamma Emitting, 600/4-80-032**

**Bias**



**Quantiles**

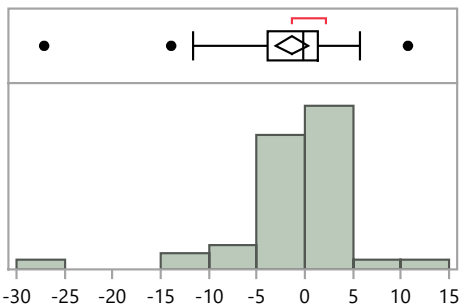
100.0%	maximum	2.1
99.5%		2.1
97.5%		2.1
90.0%		2.1
75.0%	quartile	1.5
50.0%	median	0.2
25.0%	quartile	-0.8
10.0%		-3.0
2.5%		-3.2
0.5%		-3.2
0.0%	minimum	-3.2

**Summary Statistics**

Mean	0.1
Std Dev	1.7
Std Err Mean	0.5
Upper 95% Mean	1.3
Lower 95% Mean	-1.0
N	10.0

**Distributions Analyte\_Method=Cobalt-60 No preparation - analyzed as received**

**Bias**



**Quantiles**

100.0%	maximum	10.7
99.5%		10.7
97.5%		9.6
90.0%		3.7
75.0%	quartile	1.4
50.0%	median	-0.2
25.0%	quartile	-3.8
10.0%		-6.1
2.5%		-24.1
0.5%		-27.1
0.0%	minimum	-27.1

**Summary Statistics**

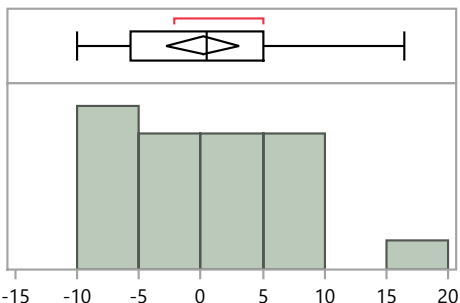
Mean	-1.4
Std Dev	5.6
Std Err Mean	0.8
Upper 95% Mean	0.2
Lower 95% Mean	-3.0
N	48.0

MaW45 Distribution by Preparation Method

**MaW Distribution by Prep Method**

**Distributions Analyte\_Method=Hydrogen-3 Distillation**

**Bias**



**Quantiles**

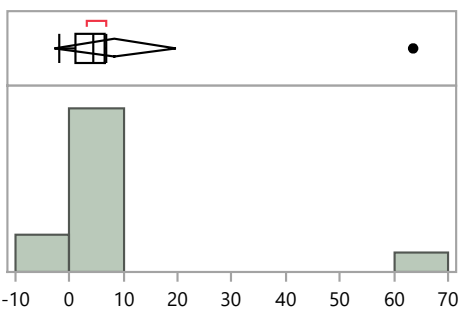
100.0%	maximum	16.4
99.5%		16.4
97.5%		16.4
90.0%		6.4
75.0%	quartile	5.1
50.0%	median	0.5
25.0%	quartile	-5.7
10.0%		-8.7
2.5%		-10.0
0.5%		-10.0
0.0%	minimum	-10.0

**Summary Statistics**

Mean	0.2
Std Dev	6.5
Std Err Mean	1.4
Upper 95% Mean	3.1
Lower 95% Mean	-2.7
N	22.0

**Distributions Analyte\_Method=Hydrogen-3 EPA 906, Tritium, 600/4/80-032**

**Bias**



**Quantiles**

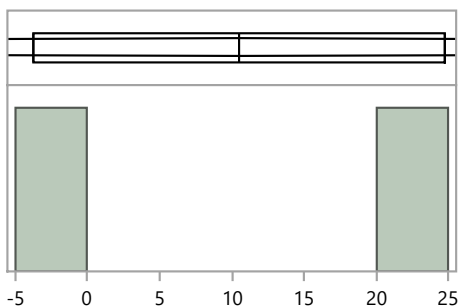
100.0%	maximum	63.5
99.5%		63.5
97.5%		63.5
90.0%		46.5
75.0%	quartile	6.6
50.0%	median	4.6
25.0%	quartile	1.2
10.0%		-1.4
2.5%		-2.0
0.5%		-2.0
0.0%	minimum	-2.0

**Summary Statistics**

Mean	8.4
Std Dev	17.6
Std Err Mean	5.1
Upper 95% Mean	19.6
Lower 95% Mean	-2.7
N	12.0

**Distributions Analyte\_Method=Hydrogen-3 No preparation - analyzed as received**

**Bias**



**Quantiles**

100.0%	maximum	24.8
99.5%		24.8
97.5%		24.8
90.0%		24.8
75.0%	quartile	24.8
50.0%	median	10.5
25.0%	quartile	-3.8
10.0%		-3.8
2.5%		-3.8
0.5%		-3.8
0.0%	minimum	-3.8

**Summary Statistics**

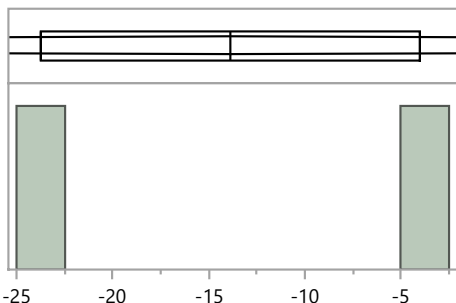
Mean	10.5
Std Dev	20.2
Std Err Mean	14.3
Upper 95% Mean	192.2
Lower 95% Mean	-171.2
N	2.0

MaW45 Distribution by Preparation Method

**MaW Distribution by Prep Method**

**Distributions Analyte\_Method=Hydrogen-3 Other**

**Bias**



**Quantiles**

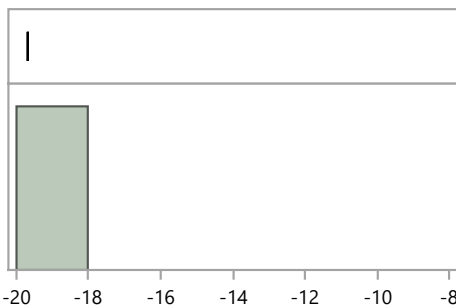
100.0%	maximum	-4.0
99.5%		-4.0
97.5%		-4.0
90.0%		-4.0
75.0%	quartile	-4.0
50.0%	median	-13.9
25.0%	quartile	-23.7
10.0%		-23.7
2.5%		-23.7
0.5%		-23.7
0.0%	minimum	-23.7

**Summary Statistics**

Mean	-13.9
Std Dev	13.9
Std Err Mean	9.8
Upper 95% Mean	111.3
Lower 95% Mean	-139.0
N	2.0

**Distributions Analyte\_Method=Iron-55 Acid dissolution with hydrofluoric acid**

**Bias**



**Quantiles**

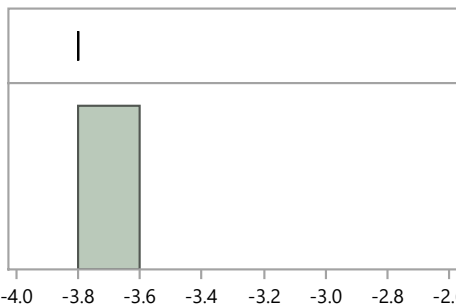
100.0%	maximum	-19.7
99.5%		-19.7
97.5%		-19.7
90.0%		-19.7
75.0%	quartile	-19.7
50.0%	median	-19.7
25.0%	quartile	-19.7
10.0%		-19.7
2.5%		-19.7
0.5%		-19.7
0.0%	minimum	-19.7

**Summary Statistics**

Mean	-19.7
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

**Distributions Analyte\_Method=Iron-55 Coprecipitation, straight**

**Bias**



**Quantiles**

100.0%	maximum	-3.8
99.5%		-3.8
97.5%		-3.8
90.0%		-3.8
75.0%	quartile	-3.8
50.0%	median	-3.8
25.0%	quartile	-3.8
10.0%		-3.8
2.5%		-3.8
0.5%		-3.8
0.0%	minimum	-3.8

**Summary Statistics**

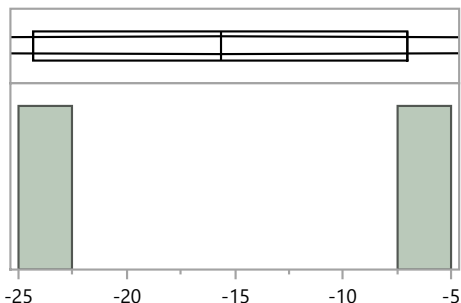
Mean	-3.8
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

MaW45 Distribution by Preparation Method

**MaW Distribution by Prep Method**

**Distributions Analyte\_Method=Iron-55 Ion Exchange Chromatography / Ion Chromatography**

**Bias**



**Quantiles**

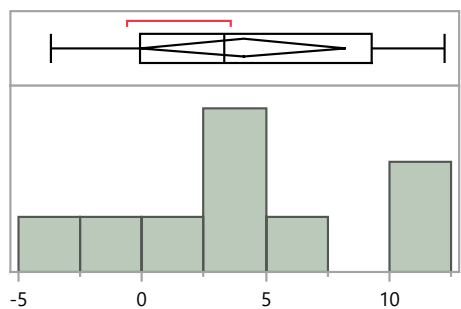
100.0%	maximum	-7.0
99.5%		-7.0
97.5%		-7.0
90.0%		-7.0
75.0%	quartile	-7.0
50.0%	median	-15.7
25.0%	quartile	-24.3
10.0%		-24.3
2.5%		-24.3
0.5%		-24.3
0.0%	minimum	-24.3

**Summary Statistics**

Mean	-15.7
Std Dev	12.2
Std Err Mean	8.7
Upper 95% Mean	94.3
Lower 95% Mean	-125.6
N	2.0

**Distributions Analyte\_Method=Manganese-54 EPA 901.1, Gamma Emitting, 600/4-80-032**

**Bias**



**Quantiles**

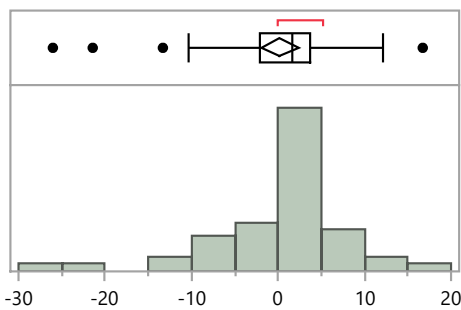
100.0%	maximum	12.2
99.5%		12.2
97.5%		12.2
90.0%		12.2
75.0%	quartile	9.3
50.0%	median	3.3
25.0%	quartile	-0.1
10.0%		-3.7
2.5%		-3.7
0.5%		-3.7
0.0%	minimum	-3.7

**Summary Statistics**

Mean	4.1
Std Dev	5.4
Std Err Mean	1.8
Upper 95% Mean	8.2
Lower 95% Mean	-0.1
N	9.0

**Distributions Analyte\_Method=Manganese-54 No preparation - analyzed as received**

**Bias**



**Quantiles**

100.0%	maximum	16.7
99.5%		16.7
97.5%		15.6
90.0%		7.9
75.0%	quartile	3.8
50.0%	median	1.7
25.0%	quartile	-2.1
10.0%		-8.9
2.5%		-24.9
0.5%		-26.0
0.0%	minimum	-26.0

**Summary Statistics**

Mean	0.2
Std Dev	7.6
Std Err Mean	1.1
Upper 95% Mean	2.4
Lower 95% Mean	-2.0
N	49.0

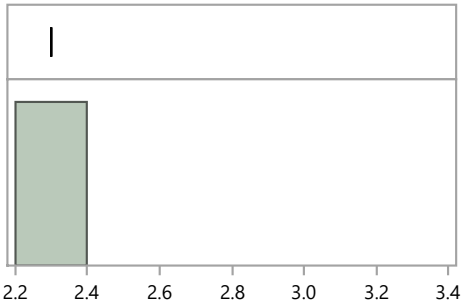


MaW45 Distribution by Preparation Method

**MaW Distribution by Prep Method**

**Distributions Analyte\_Method=Nickel-63 Acid dissolution with hydrofluoric acid**

**Bias**



**Quantiles**

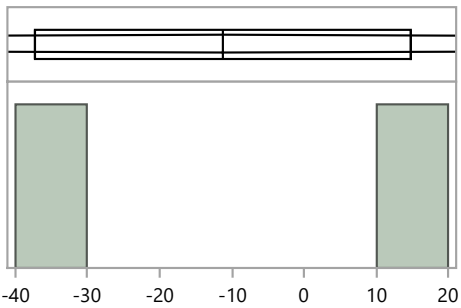
100.0%	maximum	2.3
99.5%		2.3
97.5%		2.3
90.0%		2.3
75.0%	quartile	2.3
50.0%	median	2.3
25.0%	quartile	2.3
10.0%		2.3
2.5%		2.3
0.5%		2.3
0.0%	minimum	2.3

**Summary Statistics**

Mean	2.3
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

**Distributions Analyte\_Method=Nickel-63 Coprecipitation, acidified**

**Bias**



**Quantiles**

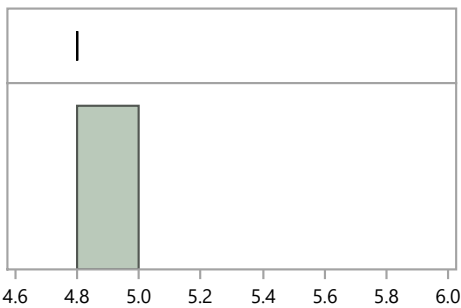
100.0%	maximum	14.9
99.5%		14.9
97.5%		14.9
90.0%		14.9
75.0%	quartile	14.9
50.0%	median	-11.2
25.0%	quartile	-37.2
10.0%		-37.2
2.5%		-37.2
0.5%		-37.2
0.0%	minimum	-37.2

**Summary Statistics**

Mean	-11.2
Std Dev	36.8
Std Err Mean	26.1
Upper 95% Mean	319.8
Lower 95% Mean	-342.1
N	2.0

**Distributions Analyte\_Method=Nickel-63 Coprecipitation, straight**

**Bias**



**Quantiles**

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

**Summary Statistics**

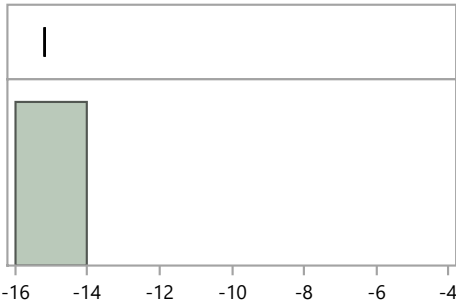
Mean	4.8
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

MaW45 Distribution by Preparation Method

**MaW Distribution by Prep Method**

**Distributions Analyte\_Method=Nickel-63 Evaporation, acidified**

**Bias**



**Quantiles**

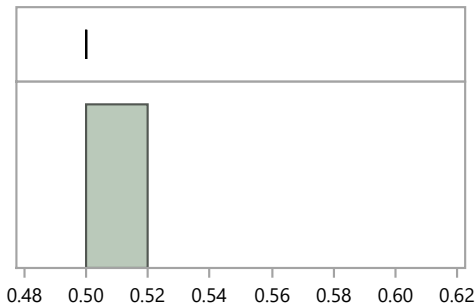
100.0%	maximum	-15.2
99.5%		-15.2
97.5%		-15.2
90.0%		-15.2
75.0%	quartile	-15.2
50.0%	median	-15.2
25.0%	quartile	-15.2
10.0%		-15.2
2.5%		-15.2
0.5%		-15.2
0.0%	minimum	-15.2

**Summary Statistics**

Mean	-15.2
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

**Distributions Analyte\_Method=Nickel-63 Ion Exchange Chromatography / Ion Chromatography**

**Bias**



**Quantiles**

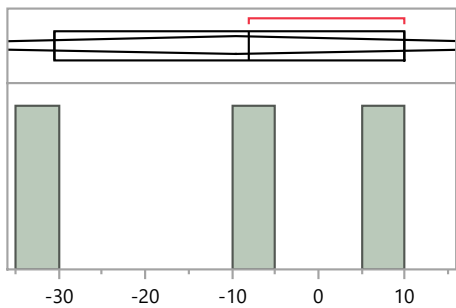
100.0%	maximum	0.5
99.5%		0.5
97.5%		0.5
90.0%		0.5
75.0%	quartile	0.5
50.0%	median	0.5
25.0%	quartile	0.5
10.0%		0.5
2.5%		0.5
0.5%		0.5
0.0%	minimum	0.5

**Summary Statistics**

Mean	0.5
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	9.9
99.5%		9.9
97.5%		9.9
90.0%		9.9
75.0%	quartile	9.9
50.0%	median	-8.1
25.0%	quartile	-30.4
10.0%		-30.4
2.5%		-30.4
0.5%		-30.4
0.0%	minimum	-30.4

**Summary Statistics**

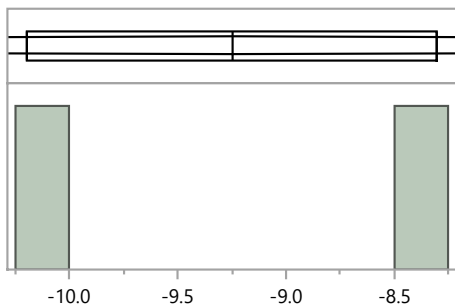
Mean	-9.5
Std Dev	20.2
Std Err Mean	11.7
Upper 95% Mean	40.6
Lower 95% Mean	-59.7
N	3.0

MaW45 Distribution by Preparation Method

**MaW Distribution by Prep Method**

**Distributions Analyte\_Method=Plutonium-239/240 Acid dissolution with hydrofluoric acid**

**Bias**



**Quantiles**

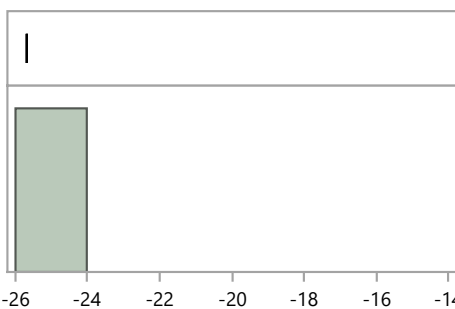
100.0%	maximum	-8.3
99.5%		-8.3
97.5%		-8.3
90.0%		-8.3
75.0%	quartile	-8.3
50.0%	median	-9.3
25.0%	quartile	-10.2
10.0%		-10.2
2.5%		-10.2
0.5%		-10.2
0.0%	minimum	-10.2

**Summary Statistics**

Mean	-9.3
Std Dev	1.3
Std Err Mean	0.9
Upper 95% Mean	2.8
Lower 95% Mean	-21.3
N	2.0

**Distributions Analyte\_Method=Plutonium-239/240 Coprecipitation, acidified**

**Bias**



**Quantiles**

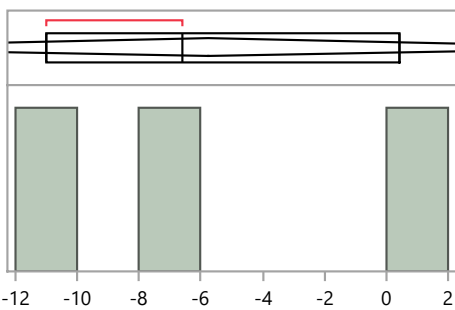
100.0%	maximum	-25.7
99.5%		-25.7
97.5%		-25.7
90.0%		-25.7
75.0%	quartile	-25.7
50.0%	median	-25.7
25.0%	quartile	-25.7
10.0%		-25.7
2.5%		-25.7
0.5%		-25.7
0.0%	minimum	-25.7

**Summary Statistics**

Mean	-25.7
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

**Distributions Analyte\_Method=Plutonium-239/240 Coprecipitation, straight**

**Bias**



**Quantiles**

100.0%	maximum	0.4
99.5%		0.4
97.5%		0.4
90.0%		0.4
75.0%	quartile	0.4
50.0%	median	-6.6
25.0%	quartile	-11.0
10.0%		-11.0
2.5%		-11.0
0.5%		-11.0
0.0%	minimum	-11.0

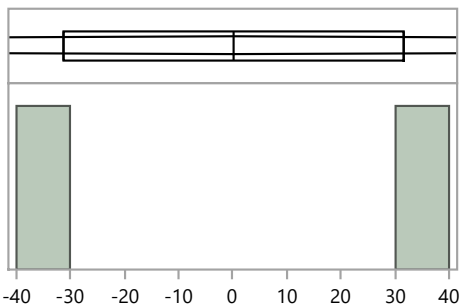
**Summary Statistics**

Mean	-5.7
Std Dev	5.7
Std Err Mean	3.3
Upper 95% Mean	8.5
Lower 95% Mean	-20.0
N	3.0

**MaW Distribution by Prep Method**

**Distributions Analyte\_Method=Plutonium-239/240 EPA 907, Actinide Elements, 600/4/80-032**

**Bias**



**Quantiles**

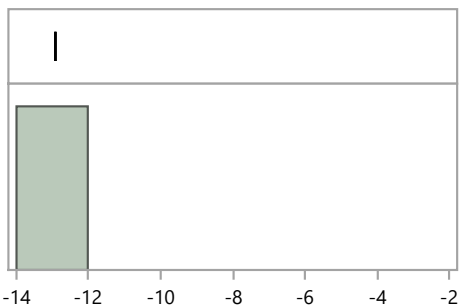
100.0%	maximum	31.6
99.5%		31.6
97.5%		31.6
90.0%		31.6
75.0%	quartile	31.6
50.0%	median	0.2
25.0%	quartile	-31.3
10.0%		-31.3
2.5%		-31.3
0.5%		-31.3
0.0%	minimum	-31.3

**Summary Statistics**

Mean	0.2
Std Dev	44.5
Std Err Mean	31.5
Upper 95% Mean	399.8
Lower 95% Mean	-399.5
N	2.0

**Distributions Analyte\_Method=Plutonium-239/240 Evaporation, acidified**

**Bias**



**Quantiles**

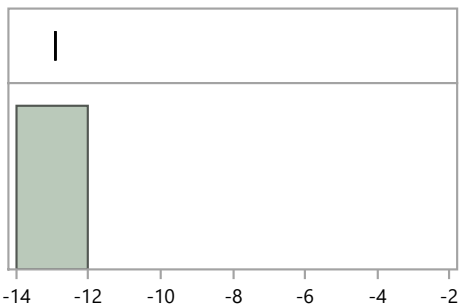
100.0%	maximum	-12.9
99.5%		-12.9
97.5%		-12.9
90.0%		-12.9
75.0%	quartile	-12.9
50.0%	median	-12.9
25.0%	quartile	-12.9
10.0%		-12.9
2.5%		-12.9
0.5%		-12.9
0.0%	minimum	-12.9

**Summary Statistics**

Mean	-12.9
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

**Distributions Analyte\_Method=Plutonium-239/240 Evaporation, straight**

**Bias**



**Quantiles**

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

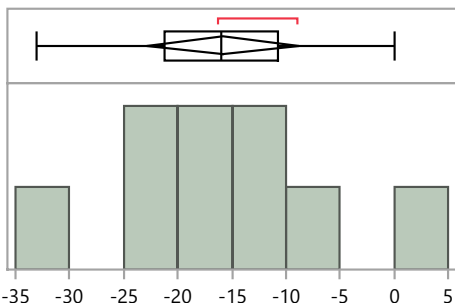
**Summary Statistics**

Mean	-12.9
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

**MaW Distribution by Prep Method**

**Distributions Analyte\_Method=Plutonium-239/240 Ion Exchange Chromatography / Ion Chromatography**

**Bias**



**Quantiles**

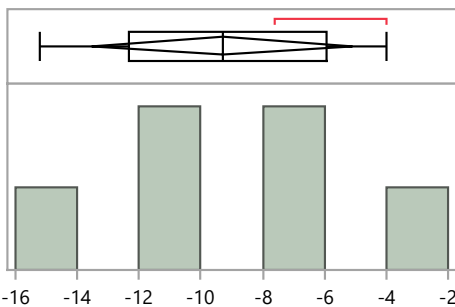
100.0%	maximum	0.0
99.5%		0.0
97.5%		0.0
90.0%		0.0
75.0%	quartile	-10.7
50.0%	median	-15.9
25.0%	quartile	-21.3
10.0%		-33.0
2.5%		-33.0
0.5%		-33.0
0.0%	minimum	-33.0

**Summary Statistics**

Mean	-15.8
Std Dev	9.2
Std Err Mean	3.1
Upper 95% Mean	-8.7
Lower 95% Mean	-22.8
N	9.0

**Distributions Analyte\_Method=Plutonium-239/240 Other**

**Bias**



**Quantiles**

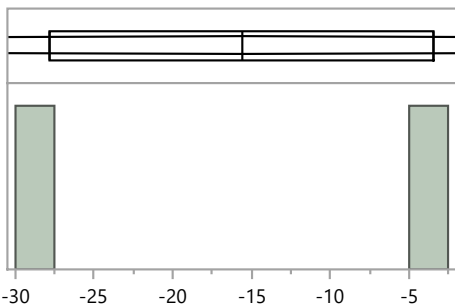
100.0%	maximum	-4.0
99.5%		-4.0
97.5%		-4.0
90.0%		-4.0
75.0%	quartile	-6.0
50.0%	median	-9.3
25.0%	quartile	-12.4
10.0%		-15.2
2.5%		-15.2
0.5%		-15.2
0.0%	minimum	-15.2

**Summary Statistics**

Mean	-9.3
Std Dev	4.0
Std Err Mean	1.6
Upper 95% Mean	-5.1
Lower 95% Mean	-13.5
N	6.0

**Distributions Analyte\_Method=Plutonium-239/240 Total dissolution by fusion**

**Bias**



**Quantiles**

100.0%	maximum	-3.4
99.5%		-3.4
97.5%		-3.4
90.0%		-3.4
75.0%	quartile	-3.4
50.0%	median	-15.6
25.0%	quartile	-27.8
10.0%		-27.8
2.5%		-27.8
0.5%		-27.8
0.0%	minimum	-27.8

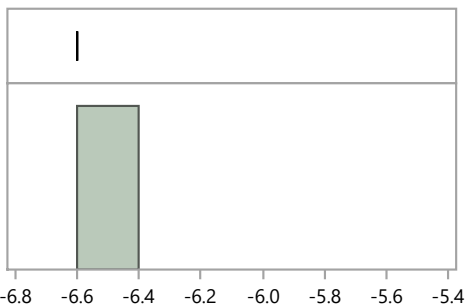
**Summary Statistics**

Mean	-15.6
Std Dev	17.3
Std Err Mean	12.2
Upper 95% Mean	139.4
Lower 95% Mean	-170.6
N	2.0

**MaW Distribution by Prep Method**

**Distributions Analyte\_Method=Radium-226 Acid dissolution with hydrofluoric acid**

**Bias**



**Quantiles**

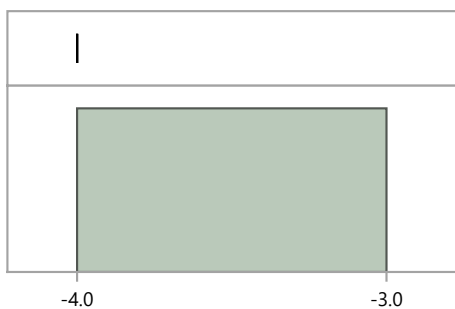
100.0%	maximum	-6.6
99.5%		-6.6
97.5%		-6.6
90.0%		-6.6
75.0%	quartile	-6.6
50.0%	median	-6.6
25.0%	quartile	-6.6
10.0%		-6.6
2.5%		-6.6
0.5%		-6.6
0.0%	minimum	-6.6

**Summary Statistics**

Mean	-6.6
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

**Distributions Analyte\_Method=Radium-226 Acid leaching without hydrofluoric acid**

**Bias**



**Quantiles**

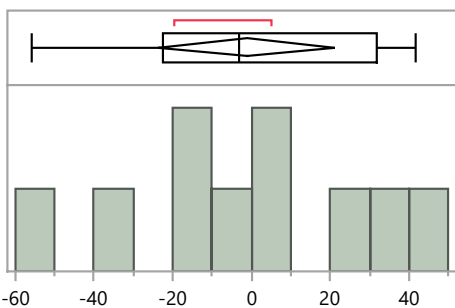
100.0%	maximum	-4.0
99.5%		-4.0
97.5%		-4.0
90.0%		-4.0
75.0%	quartile	-4.0
50.0%	median	-4.0
25.0%	quartile	-4.0
10.0%		-4.0
2.5%		-4.0
0.5%		-4.0
0.0%	minimum	-4.0

**Summary Statistics**

Mean	-4.0
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

**Distributions Analyte\_Method=Radium-226 Coprecipitation, acidified**

**Bias**



**Quantiles**

100.0%	maximum	41.6
99.5%		41.6
97.5%		41.6
90.0%		41.3
75.0%	quartile	31.6
50.0%	median	-3.1
25.0%	quartile	-22.5
10.0%		-53.4
2.5%		-55.8
0.5%		-55.8
0.0%	minimum	-55.8

**Summary Statistics**

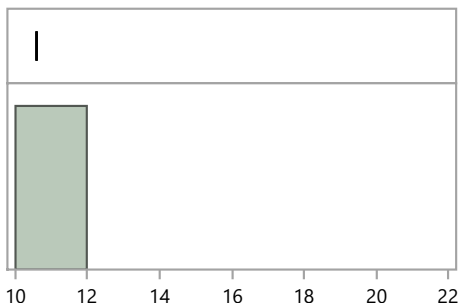
Mean	-1.2
Std Dev	31.3
Std Err Mean	9.9
Upper 95% Mean	21.2
Lower 95% Mean	-23.5
N	10.0

MaW45 Distribution by Preparation Method

**MaW Distribution by Prep Method**

**Distributions Analyte\_Method=Radium-226 Coprecipitation, straight**

**Bias**



**Quantiles**

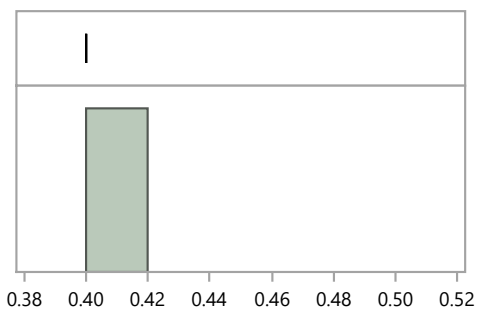
100.0%	maximum	10.6
99.5%		10.6
97.5%		10.6
90.0%		10.6
75.0%	quartile	10.6
50.0%	median	10.6
25.0%	quartile	10.6
10.0%		10.6
2.5%		10.6
0.5%		10.6
0.0%	minimum	10.6

**Summary Statistics**

Mean	10.6
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

**Distributions Analyte\_Method=Radium-226 EPA 00-07 - Radiochemistry Procedures Manual**

**Bias**



**Quantiles**

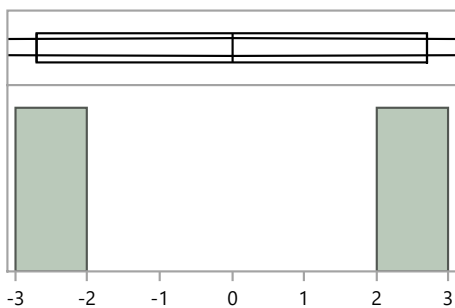
100.0%	maximum	0.4
99.5%		0.4
97.5%		0.4
90.0%		0.4
75.0%	quartile	0.4
50.0%	median	0.4
25.0%	quartile	0.4
10.0%		0.4
2.5%		0.4
0.5%		0.4
0.0%	minimum	0.4

**Summary Statistics**

Mean	0.4
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

**Distributions Analyte\_Method=Radium-226 Ion Exchange Chromatography / Ion Chromatography**

**Bias**



**Quantiles**

100.0%	maximum	2.7
99.5%		2.7
97.5%		2.7
90.0%		2.7
75.0%	quartile	2.7
50.0%	median	0.0
25.0%	quartile	-2.7
10.0%		-2.7
2.5%		-2.7
0.5%		-2.7
0.0%	minimum	-2.7

**Summary Statistics**

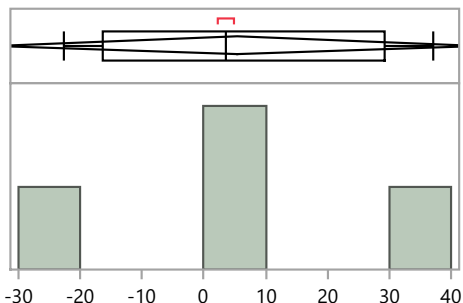
Mean	0.0
Std Dev	3.8
Std Err Mean	2.7
Upper 95% Mean	34.3
Lower 95% Mean	-34.3
N	2.0

MaW45 Distribution by Preparation Method

**MaW Distribution by Prep Method**

**Distributions Analyte\_Method=Radium-226 Other**

**Bias**



**Quantiles**

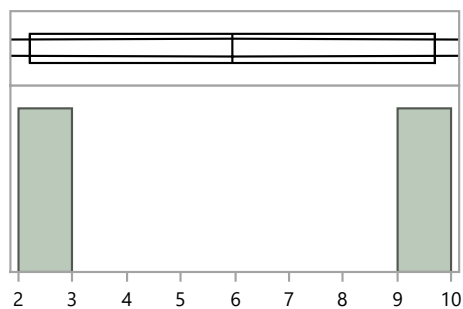
100.0%	maximum	37.2
99.5%		37.2
97.5%		37.2
90.0%		37.2
75.0%	quartile	29.1
50.0%	median	3.6
25.0%	quartile	-16.4
10.0%		-22.6
2.5%		-22.6
0.5%		-22.6
0.0%	minimum	-22.6

**Summary Statistics**

Mean	5.4
Std Dev	24.5
Std Err Mean	12.3
Upper 95% Mean	44.5
Lower 95% Mean	-33.6
N	4.0

**Distributions Analyte\_Method=Radium-226 Total dissolution by fusion**

**Bias**



**Quantiles**

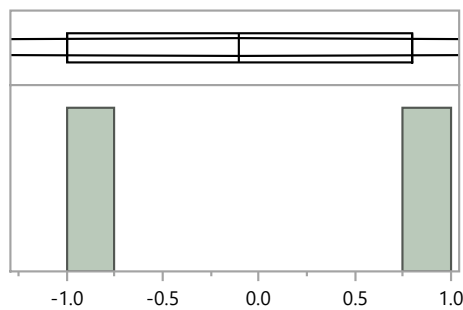
100.0%	maximum	9.7
99.5%		9.7
97.5%		9.7
90.0%		9.7
75.0%	quartile	9.7
50.0%	median	6.0
25.0%	quartile	2.2
10.0%		2.2
2.5%		2.2
0.5%		2.2
0.0%	minimum	2.2

**Summary Statistics**

Mean	6.0
Std Dev	5.3
Std Err Mean	3.8
Upper 95% Mean	53.6
Lower 95% Mean	-41.7
N	2.0

**Distributions Analyte\_Method=Strontium-90 Acid dissolution with hydrofluoric acid**

**Bias**



**Quantiles**

100.0%	maximum	0.8
99.5%		0.8
97.5%		0.8
90.0%		0.8
75.0%	quartile	0.8
50.0%	median	-0.1
25.0%	quartile	-1.0
10.0%		-1.0
2.5%		-1.0
0.5%		-1.0
0.0%	minimum	-1.0

**Summary Statistics**

Mean	-0.1
Std Dev	1.3
Std Err Mean	0.9
Upper 95% Mean	11.3
Lower 95% Mean	-11.5
N	2.0

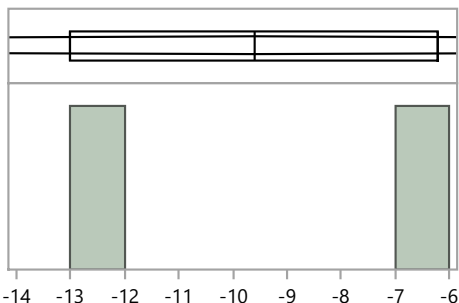


MaW45 Distribution by Preparation Method

**MaW Distribution by Prep Method**

**Distributions Analyte\_Method=Strontium-90 Coprecipitation, acidified**

**Bias**



**Quantiles**

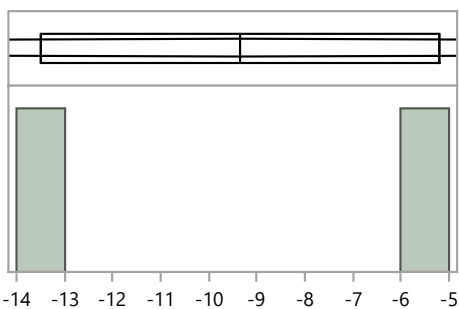
100.0%	maximum	-6.2
99.5%		-6.2
97.5%		-6.2
90.0%		-6.2
75.0%	quartile	-6.2
50.0%	median	-9.6
25.0%	quartile	-13.0
10.0%		-13.0
2.5%		-13.0
0.5%		-13.0
0.0%	minimum	-13.0

**Summary Statistics**

Mean	-9.6
Std Dev	4.8
Std Err Mean	3.4
Upper 95% Mean	33.6
Lower 95% Mean	-52.8
N	2.0

**Distributions Analyte\_Method=Strontium-90 Coprecipitation, straight**

**Bias**



**Quantiles**

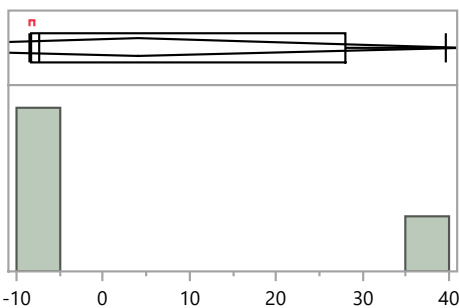
100.0%	maximum	-5.2
99.5%		-5.2
97.5%		-5.2
90.0%		-5.2
75.0%	quartile	-5.2
50.0%	median	-9.4
25.0%	quartile	-13.5
10.0%		-13.5
2.5%		-13.5
0.5%		-13.5
0.0%	minimum	-13.5

**Summary Statistics**

Mean	-9.4
Std Dev	5.9
Std Err Mean	4.2
Upper 95% Mean	43.4
Lower 95% Mean	-62.1
N	2.0

**Distributions Analyte\_Method=Strontium-90 EPA 905, Radioactive Strontium, 600/4-80-032**

**Bias**



**Quantiles**

100.0%	maximum	39.5
99.5%		39.5
97.5%		39.5
90.0%		39.5
75.0%	quartile	28.0
50.0%	median	-7.4
25.0%	quartile	-8.4
10.0%		-8.5
2.5%		-8.5
0.5%		-8.5
0.0%	minimum	-8.5

**Summary Statistics**

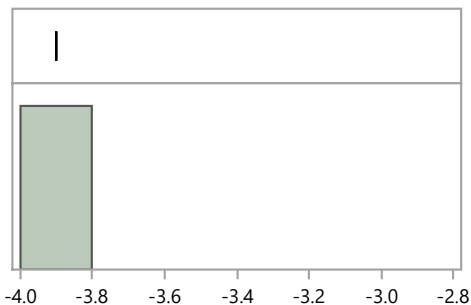
Mean	4.1
Std Dev	23.6
Std Err Mean	11.8
Upper 95% Mean	41.7
Lower 95% Mean	-33.5
N	4.0

MaW45 Distribution by Preparation Method

**MaW Distribution by Prep Method**

**Distributions Analyte\_Method=Strontium-90 Evaporation, straight**

**Bias**



**Quantiles**

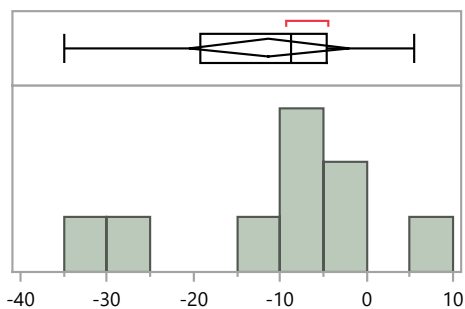
100.0%	maximum	-3.9
99.5%		-3.9
97.5%		-3.9
90.0%		-3.9
75.0%	quartile	-3.9
50.0%	median	-3.9
25.0%	quartile	-3.9
10.0%		-3.9
2.5%		-3.9
0.5%		-3.9
0.0%	minimum	-3.9

**Summary Statistics**

Mean	-3.9
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

**Distributions Analyte\_Method=Strontium-90 Ion Exchange Chromatography / Ion Chromatography**

**Bias**



**Quantiles**

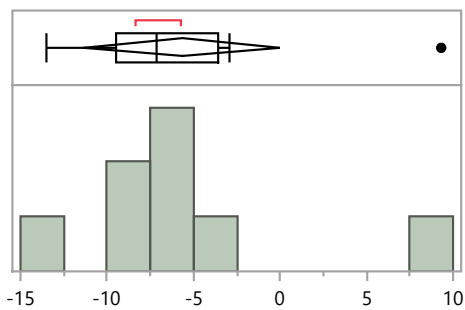
100.0%	maximum	5.4
99.5%		5.4
97.5%		5.4
90.0%		5.4
75.0%	quartile	-4.6
50.0%	median	-8.8
25.0%	quartile	-19.3
10.0%		-35.0
2.5%		-35.0
0.5%		-35.0
0.0%	minimum	-35.0

**Summary Statistics**

Mean	-11.3
Std Dev	12.1
Std Err Mean	4.0
Upper 95% Mean	-2.0
Lower 95% Mean	-20.5
N	9.0

**Distributions Analyte\_Method=Strontium-90 Other**

**Bias**



**Quantiles**

100.0%	maximum	9.3
99.5%		9.3
97.5%		9.3
90.0%		9.3
75.0%	quartile	-3.6
50.0%	median	-7.2
25.0%	quartile	-9.4
10.0%		-13.5
2.5%		-13.5
0.5%		-13.5
0.0%	minimum	-13.5

**Summary Statistics**

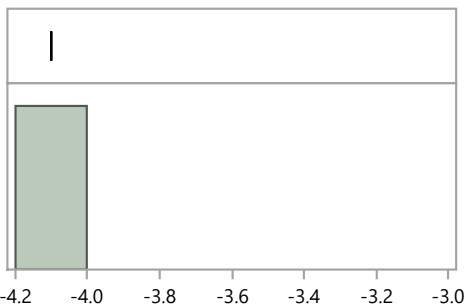
Mean	-5.7
Std Dev	6.8
Std Err Mean	2.4
Upper 95% Mean	0.0
Lower 95% Mean	-11.3
N	8.0

MaW45 Distribution by Preparation Method

**MaW Distribution by Prep Method**

**Distributions Analyte\_Method=Strontium-90 Total dissolution by fusion**

**Bias**



**Quantiles**

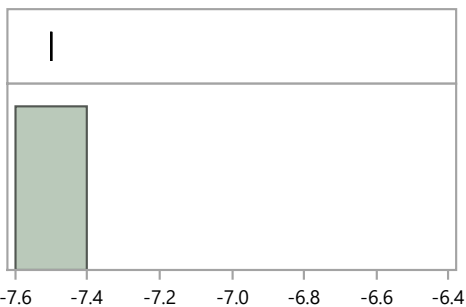
100.0%	maximum	-4.1
99.5%		-4.1
97.5%		-4.1
90.0%		-4.1
75.0%	quartile	-4.1
50.0%	median	-4.1
25.0%	quartile	-4.1
10.0%		-4.1
2.5%		-4.1
0.5%		-4.1
0.0%	minimum	-4.1

**Summary Statistics**

Mean	-4.1
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**

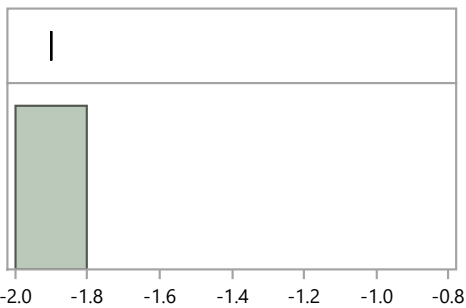
100.0%	maximum	-7.5
99.5%		-7.5
97.5%		-7.5
90.0%		-7.5
75.0%	quartile	-7.5
50.0%	median	-7.5
25.0%	quartile	-7.5
10.0%		-7.5
2.5%		-7.5
0.5%		-7.5
0.0%	minimum	-7.5

**Summary Statistics**

Mean	-7.5
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

**Distributions Analyte\_Method=Technetium-99 Coprecipitation, acidified**

**Bias**



**Quantiles**

100.0%	maximum	-1.9
99.5%		-1.9
97.5%		-1.9
90.0%		-1.9
75.0%	quartile	-1.9
50.0%	median	-1.9
25.0%	quartile	-1.9
10.0%		-1.9
2.5%		-1.9
0.5%		-1.9
0.0%	minimum	-1.9

**Summary Statistics**

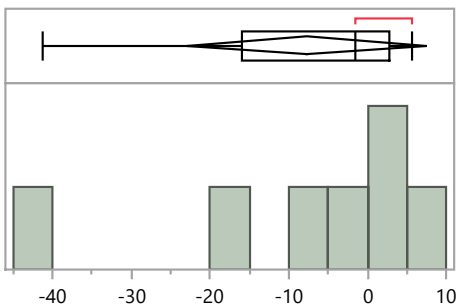
Mean	-1.9
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

MaW45 Distribution by Preparation Method

**MaW Distribution by Prep Method**

**Distributions Analyte\_Method=Technetium-99 Ion Exchange Chromatography / Ion Chromatography**

**Bias**



**Quantiles**

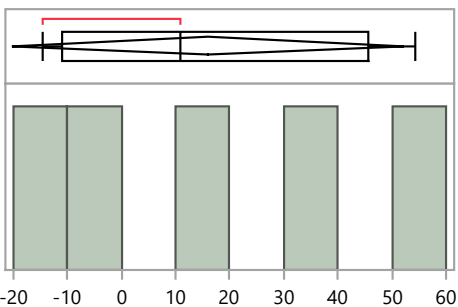
100.0%	maximum	5.7
99.5%		5.7
97.5%		5.7
90.0%		5.7
75.0%	quartile	2.7
50.0%	median	-1.6
25.0%	quartile	-15.9
10.0%		-41.2
2.5%		-41.2
0.5%		-41.2
0.0%	minimum	-41.2

**Summary Statistics**

Mean	-7.7
Std Dev	16.4
Std Err Mean	6.2
Upper 95% Mean	7.5
Lower 95% Mean	-22.9
N	7.0

**Distributions Analyte\_Method=Technetium-99 Other**

**Bias**



**Quantiles**

100.0%	maximum	54.2
99.5%		54.2
97.5%		54.2
90.0%		54.2
75.0%	quartile	45.5
50.0%	median	10.8
25.0%	quartile	-11.0
10.0%		-14.6
2.5%		-14.6
0.5%		-14.6
0.0%	minimum	-14.6

**Summary Statistics**

Mean	16.0
Std Dev	29.1
Std Err Mean	13.0
Upper 95% Mean	52.1
Lower 95% Mean	-20.2
N	5.0