

## **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.

## MaW41 Participating Laboratories

<b>Lab Code</b>	<b>Lab Name</b>	<b>Matrix Code</b>
ADEM01	Alabama Department of Environmental Management	MaW
ADFC99	Abu Dhabi Quality and Conformity Council-Central Testing Lab	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
ARSA01	ARS Aleut Analytical, LLC (Luckey)	MaW
ARSL01	ARS Aleut Analytical, LLC	MaW
AY1201	Consolidated Nuclear Security, LLC, ACO Laboratory	MaW
BRLL01	Brooks Applied Labs, LLC	MaW
BY1201	Consolidated Nuclear Security, LLC, ACO, Production Laboratory	MaW
CDHS01	California Department of Public Health	MaW
CEBM01	Cebam Analytical, Inc	MaW
CESL01	Lawrence Livermore National Laboratory - EMRL	MaW
CHMH01	222-S Laboratory	MaW
CMRC01	Carlsbad Environmental Monitoring and Research Center	MaW
COPS99	Health Canada Radiation Protection Bureau	MaW
CORE02	TestAmerica Denver	MaW
DEHS01	Department of Environmental Health & Safety	MaW
DLEA01	DLE Associates	MaW
EFGS01	Eurofins Frontier Global Sciences, LLC.	MaW
ELIW01	Energy Laboratories, Inc.	MaW
EMAX01	EMAX Laboratories, Inc	MaW
ERAD01	Lawrence Livermore National Laboratory ERAD	MaW
ERCL01	Washington State Public Health Laboratories	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
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
MART01	Fluor B&W Ports Analytical Laboratory	MaW
MART03	Radioactive Material Analysis Laboratory	MaW
MNDH01	Minnesota Department of Health, Public Health Lab. Division	MaW
MSDH01	Mississippi State Dept of Health	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
NRLL99	Environmental Radioactivity - National Centre for Radiation Science	MaW
ODHL01	Ohio Department of Health Laboratory	MaW
ORIS01	ORISE/IEAV	MaW
OTLI01	Pace Analytical National Center for Testing & Innovation	MaW
QUAN02	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 SERVICES OAK RIDGE LABORATORY	MaW
TNUT01	St. Louis USACE FUSRAP Laboratory	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
WSTP99	Cavendish Nuclear Limited	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>
FMEC99	Foods and Water Laboratories Center	MaW
QUAN01	TestAmerica St. Louis	MaW

## Study Reference Values

MAPEP-19-MaW41

Radiological Reference Date: 08/01/2019

Analyte	Ref Value	Ref Unc
Inorganic Units: (mg/L)		
Antimony	11.5	0.2
Arsenic	2.53	0.05
Barium	1.32	0.04
Beryllium	4.55	0.09
Cadmium	0.433	0.009
Chromium	0.00061	0.00006
Cobalt	14.4	0.3
Copper	16.1	0.3
Lead	0.547	0.011
Mercury	0.0921	0.0018
Nickel	18.6	0.4
Selenium	0.535	0.011
Uranium-235	6.04E-4	1.30E-5
Uranium-238	0.085	0.002
Uranium-Total	0.085	0.003
Vanadium	3.02	0.06
Zinc	5.38	0.11

Analyte	Ref Value	Ref Unc
Radiological Units: (Bq/L)		
Americium-241	0.522	0.008
Cesium-137	18.4	0.3
Cobalt-57	15.6	0.3
Cobalt-60	8.8	0.2
Hydrogen-3	175	4
Iron-55	15.7	0.3
Manganese-54	20.6	0.4
Nickel-63	9.7	0.3
Plutonium-238	0.0063	0.0015
Plutonium-239/240	0.727	0.011
Radium-226	0.307	0.006
Strontium-90	10.6	0.2
Uranium-234	1.07	0.04
Uranium-238	1.05	0.03
Zinc-65	20.3	0.4

## Sample Statistical Summary

MAPEP-19-MaW41

Radiological Reference Date: 08/01/2019

Analyte	T(1)	A(2)	Grand <sup>(3)</sup> Mean	Std Dev	Ref Value	Ref Unc	Acceptance Range
							Units: (mg/L)
Inorganic							
Antimony	24	24	11.5	0.6	11.5	0.2	8.1 - 15.0
Arsenic	26	26	2.48	0.11	2.53	0.05	1.77 - 3.29
Barium	26	26	1.24	0.05	1.32	0.04	0.92 - 1.72
Beryllium	25	25	4.50	0.29	4.55	0.09	3.19 - 5.92
Cadmium	26	26	0.426	0.023	0.433	0.009	0.303 - 0.563
Chromium	24	15	0.00736	0.01380	0.00061	0.00006	Sensitivity Evaluation
Cobalt	25	25	14.2	0.7	14.4	0.3	10.1 - 18.7
Copper	26	26	16.0	0.7	16.1	0.3	11.3 - 20.9
Lead	26	26	0.549	0.027	0.547	0.011	0.383 - 0.711
Mercury	23	21	0.0920	0.0077	0.0921	0.0018	0.0645 - 0.1197
Nickel	26	26	18.5	0.9	18.6	0.4	13.0 - 24.2
Selenium	24	23	0.521	0.033	0.535	0.011	0.375 - 0.696
Technetium-99	6	3					False Positive Test
Thallium	23	14					False Positive Test
Uranium-235	17	17	6.20E-4	6.60E-5	6.04E-4	1.30E-5	4.23E-4 - 7.85E-4
Uranium-238	19	19	0.086	0.009	0.085	0.002	0.060 - 0.111
Uranium-Total	26	26	0.085	0.008	0.085	0.003	0.060 - 0.111
Vanadium	23	23	3.08	0.22	3.02	0.06	2.11 - 3.93
Zinc	26	26	5.29	0.23	5.38	0.11	3.77 - 6.99

Analyte	T(1)	A(2)	Grand <sup>(3)</sup> Mean	Std Dev	Ref Value	Ref Unc	Acceptance Range
							Units: (Bq/L)
Radiological							
Americium-241	40	32	0.493	0.050	0.522	0.008	0.365 - 0.679
Cesium-134	57	52					False Positive Test
Cesium-137	65	64	18.7	1.0	18.4	0.3	12.9 - 23.9
Cobalt-57	65	64	15.3	0.9	15.6	0.3	10.9 - 20.3
Cobalt-60	65	64	8.8	0.5	8.8	0.2	6.2 - 11.4
Hydrogen-3	44	39	175	13	175	4	123 - 228
Iron-55	9	8	15.0	2.0	15.7	0.3	11.0 - 20.4
Manganese-54	65	64	20.7	1.0	20.6	0.4	14.4 - 26.8
Nickel-63	13	11	9.8	1.1	9.7	0.3	6.8 - 12.6
Plutonium-238	33	31	0.0099	0.0097	0.0063	0.0015	Sensitivity Evaluation
Plutonium-239/240	33	33	0.666	0.053	0.727	0.011	0.509 - 0.945
Potassium-40	55	47					False Positive Test
Radium-226	26	19	0.312	0.050	0.307	0.006	0.215 - 0.399
Strontium-90	33	31	9.8	1.0	10.6	0.2	7.4 - 13.8
Technetium-99	18	15					False Positive Test
Uranium-234	36	34	1.06	0.10	1.07	0.04	0.75 - 1.39
Uranium-238	37	35	1.04	0.10	1.05	0.03	0.74 - 1.37
Zinc-65	65	64	20.6	1.6	20.3	0.4	14.2 - 26.4

**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".

**Result Flags:**

A = Result acceptable Bias  $\leq 20\%$

W = Result acceptable with warning  $20\% < \text{Bias} < 30\%$

N = Result not acceptable Bias  $> 30\%$

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP $< 2\%$

ACCEPTABLE..... $2\% \leq \text{RP} \leq 15\%$

ACCEPTABLE WITH WARNING..... $15\% < \text{RP} \leq 30\%$

NOT ACCEPTABLE.....RP $> 30\%$

RP = Relative Precision

## Flag Summary Report

MAPEP-19-MaW41

### Inorganic

Analyte	A	W	RW	N
Antimony	24			
Arsenic	26			
Barium	26			
Beryllium	25			
Cadmium	26			
Chromium	15		9	
Cobalt	25			
Copper	26			
Lead	26			
Mercury	20	1		2
Nickel	26			
Selenium	23			1
Thallium	14			9
Uranium-Total	24	2		
Uranium-235	15	2		
Uranium-238	17	2		
Vanadium	22	1		
Zinc	26			
Technetium-99	3			3

### Radiological

Analyte	A	W	RW	N
Americium-241	31	1		8
Cesium-134	52			11
Cesium-137	64			1
Cobalt-57	63	1		1
Cobalt-60	64			1
Hydrogen-3	38	1		5
Iron-55	7	1		1
Manganese-54	64			1
Nickel-63	10	1		2
Plutonium-238	31			2
Plutonium-239/240	31	2		
Potassium-40	47			18
Radium-226	12	7		7
Strontium-90	30	1		2
Technetium-99	15			3
Uranium-234	32	2		2
Uranium-238	32	3		2
Zinc-65	64			1





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

*Laboratory Results For MAPEP-19-MaW41*

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

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.522				0.365 - 0.679		
Cesium-134	NR		N	(11)		False Positive Test		
Cesium-137	20.70	18.4	A		12.5	12.9 - 23.9	0.61	A
Cobalt-57	16.40	15.6	A		5.1	10.9 - 20.3	0.34	A
Cobalt-60	9.86	8.8	A		12.0	6.2 - 11.4	0.22	A
Hydrogen-3	NR	175				123 - 228		
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	23.40	20.6	A		13.6	14.4 - 26.8	0.59	A
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	NR	0.0063				Sensitivity Evaluation		
Plutonium-239/240	NR	0.727				0.509 - 0.945		
Potassium-40	NR		N	(11)		False Positive Test		
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	NR					False Positive Test		
Uranium-234	NR	1.07				0.75 - 1.39		
Uranium-238	NR	1.05				0.74 - 1.37		
Zinc-65	23.80	20.3	A		17.2	14.2 - 26.4	0.68	A

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**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
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte
- (29) = Statistically significant negative value at 3 standard deviations



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

## Laboratory Results For MAPEP-19-MaW41

(ADFC99) Abu Dhabi Quality and Conformity Council-Central Testing Lab

Radiation Lab

Abu Dhabi, - -

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.522				0.365 - 0.679		
Cesium-134	0.07		A			False Positive Test	0.06	
Cesium-137	17.55	18.4	A		-4.6	12.9 - 23.9	0.28	N
Cobalt-57	14.83	15.6	A		-4.9	10.9 - 20.3	0.22	N
Cobalt-60	8.52	8.8	A		-3.2	6.2 - 11.4	0.11	N
Hydrogen-3	200.66	175	A		14.7	123 - 228	12.83	A
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	19.14	20.6	A		-7.1	14.4 - 26.8	0.27	N
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	NR	0.0063				Sensitivity Evaluation		
Plutonium-239/240	NR	0.727				0.509 - 0.945		
Potassium-40	1.59		N	(1)		False Positive Test	0.38	
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	10.03	10.6	A		-5.4	7.4 - 13.8	0.37	A
Technetium-99	NR					False Positive Test		
Uranium-234	NR	1.07				0.75 - 1.39		
Uranium-238	NR	1.05				0.74 - 1.37		
Zinc-65	19.37	20.3	A		-4.6	14.2 - 26.4	0.32	N

Radiological Reference Date: August 1, 2019

**Result Flags:**

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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%

RP = Relative Precision

**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
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte
- (29) = Statistically significant negative value at 3 standard deviations



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

*Laboratory Results For MAPEP-19-MaW41*

(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	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.450	0.522	A		-13.8	0.365 - 0.679	0.026	A
Cesium-134	-0.05			A		False Positive Test	0.08	
Cesium-137	17.78	18.4	A		-3.4	12.9 - 23.9	0.51	A
Cobalt-57	14.29	15.6	A		-8.4	10.9 - 20.3	0.45	A
Cobalt-60	8.42	8.8	A		-4.3	6.2 - 11.4	0.23	A
Hydrogen-3	162	175	A		-7.4	123 - 228	25	W
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	19.40	20.6	A		-5.8	14.4 - 26.8	0.50	A
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	0.0048	0.0063	A			Sensitivity Evaluation	0.0012	
Plutonium-239/240	0.648	0.727	A		-10.9	0.509 - 0.945	0.036	A
Potassium-40	0.47			A		False Positive Test	0.37	
Radium-226	0.303	0.307	A		-1.3	0.215 - 0.399	0.031	A

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	8.90	10.6	A		-16.0	7.4 - 13.8	0.27	A
Technetium-99	NR					False Positive Test		
Uranium-234	1.084	1.07	A		1.3	0.75 - 1.39	0.057	A
Uranium-238	1.043	1.05	A		-0.7	0.74 - 1.37	0.055	A
Zinc-65	19.18	20.3	A		-5.5	14.2 - 26.4	0.61	A

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**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
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte
- (29) = Statistically significant negative value at 3 standard deviations



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

*Laboratory Results For MAPEP-19-MaW41*

(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	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.46	0.522	A		-11.9	0.365 - 0.679	0.31	N
Cesium-134	-0.44		A			False Positive Test	0.61	
Cesium-137	19.37	18.4	A		5.3	12.9 - 23.9	0.78	A
Cobalt-57	16.03	15.6	A		2.8	10.9 - 20.3	0.47	A
Cobalt-60	9.03	8.8	A		2.6	6.2 - 11.4	0.25	A
Hydrogen-3	178.69	175	A		2.1	123 - 228	3.56	N
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	21.65	20.6	A		5.1	14.4 - 26.8	0.5	A
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	0.021	0.0063	A			Sensitivity Evaluation	0.006	
Plutonium-239/240	0.666	0.727	A		-8.4	0.509 - 0.945	0.071	A
Potassium-40	NR		N	(11)		False Positive Test		
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	10.34	10.6	A		-2.5	7.4 - 13.8	0.294	A
Technetium-99	NR					False Positive Test		
Uranium-234	0.90	1.07	A		-15.9	0.75 - 1.39	0.052	A
Uranium-238	0.91	1.05	A		-13.3	0.74 - 1.37	0.05	A
Zinc-65	19.86	20.3	A		-2.2	14.2 - 26.4	1.51	A

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**Notes:**

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- (4) = Sensitivity Evaluation
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- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte
- (29) = Statistically significant negative value at 3 standard deviations





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

Laboratory Results For MAPEP-19-MaW41  
 (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	11.3	11.5	A		-1.7	8.1 - 15.0	0.792570	A
Arsenic	2.45	2.53	A		-3.2	1.77 - 3.29	0.173111	A
Barium	1.25	1.32	A		-5.3	0.92 - 1.72	0.086127	A
Beryllium	4.61	4.55	A		1.3	3.19 - 5.92	0.487738	A
Cadmium	0.422	0.433	A		-2.5	0.303 - 0.563	0.027918	A
Chromium	0.01	0.00061	A	(17)		Sensitivity Evaluation	0.01	
Cobalt	15.6	14.4	A		8.3	10.1 - 18.7	4.519867	W
Copper	16.7	16.1	A		3.7	11.3 - 20.9	3.363742	W
Lead	0.527	0.547	A		-3.7	0.383 - 0.711	0.031849	A
Mercury	0.0984	0.0921	A		6.8	0.0645 - 0.1197	0.012741	A
Nickel	20.3	18.6	A		9.1	13.0 - 24.2	4.532482	W
Selenium	0.513	0.535	A		-4.1	0.375 - 0.696	0.043040	A
Technetium-99	NR					False Positive Test		
Thallium	0.01		A			False Positive Test	0.01	
Uranium-235	0.000567	0.000604	A		-6.1	4.23E-4 - 7.85E-4	0.000049	A
Uranium-238	0.0862	0.085	A		1.4	0.060 - 0.111	0.005432	A
Uranium-Total	0.0868	0.085	A		2.1	0.060 - 0.111	0.007495	A
Vanadium	3.09	3.02	A		2.3	2.11 - 3.93	0.180431	A
Zinc	5.37	5.38	A		-0.2	3.77 - 6.99	0.963219	W

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.434	0.522	A		-16.9	0.365 - 0.679	0.037	A
Cesium-134	0.388		A			False Positive Test	0.388	
Cesium-137	18.2	18.4	A		-1.1	12.9 - 23.9	1.1	A
Cobalt-57	15.1	15.6	A		-3.2	10.9 - 20.3	0.9	A
Cobalt-60	8.64	8.8	A		-1.8	6.2 - 11.4	0.52	A
Hydrogen-3	139	175	W		-20.6	123 - 228	12	A
Iron-55	19.6	15.7	W		24.8	11.0 - 20.4	2.3	A
Manganese-54	20.0	20.6	A		-2.9	14.4 - 26.8	1.2	A
Nickel-63	10.5	9.7	A		8.2	6.8 - 12.6	1.4	A
Plutonium-238	0.006	0.0063	A	(17)		Sensitivity Evaluation	0.006	
Plutonium-239/240	0.569	0.727	W		-21.7	0.509 - 0.945	0.048	A
Potassium-40	6.35		A			False Positive Test	6.35	
Radium-226	0.273	0.307	A		-11.1	0.215 - 0.399	0.048	W

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	9.60	10.6	A		-9.4	7.4 - 13.8	1.10	A
Technetium-99	0.079		A			False Positive Test	0.079	
Uranium-234	1.05	1.07	A		-1.9	0.75 - 1.39	0.08	A
Uranium-238	1.00	1.05	A		-4.8	0.74 - 1.37	0.08	A
Zinc-65	20.1	20.3	A		-1.0	14.2 - 26.4	1.3	A

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**Notes:**

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

*Laboratory Results For MAPEP-19-MaW41*

(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	11.29	11.5	A		-1.8	8.1 - 15.0	1.13	A
Arsenic	2.28	2.53	A		-9.9	1.77 - 3.29	0.23	A
Barium	1.19	1.32	A		-9.8	0.92 - 1.72	0.12	A
Beryllium	4.25	4.55	A		-6.6	3.19 - 5.92	0.43	A
Cadmium	0.42	0.433	A		-3.0	0.303 - 0.563	0.04	A
Chromium	0.03	0.00061	A	(17)		Sensitivity Evaluation	0.03	
Cobalt	12.60	14.4	A		-12.5	10.1 - 18.7	1.26	A
Copper	15.35	16.1	A		-4.7	11.3 - 20.9	1.54	A
Lead	0.55	0.547	A		0.5	0.383 - 0.711	0.06	A
Mercury	0.10	0.0921	A		8.6	0.0645 - 0.1197	.01	A
Nickel	18.27	18.6	A		-1.8	13.0 - 24.2	1.83	A
Selenium	0.48	0.535	A		-10.3	0.375 - 0.696	0.05	A
Technetium-99	NR					False Positive Test		
Thallium	0.03		A			False Positive Test	0.03	
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	5.13	5.38	A		-4.6	3.77 - 6.99	0.5	A

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.522				0.365 - 0.679		
Cesium-134	NR		N	(11)		False Positive Test		
Cesium-137	NR	18.4	N	(25)		12.9 - 23.9		
Cobalt-57	NR	15.6	N	(28)		10.9 - 20.3		
Cobalt-60	NR	8.8	N	(28)		6.2 - 11.4		
Hydrogen-3	NR	175	N	(28)		123 - 228		
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	NR	20.6	N	(28)		14.4 - 26.8		
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	NR	0.0063				Sensitivity Evaluation		
Plutonium-239/240	NR	0.727				0.509 - 0.945		
Potassium-40	NR		N	(11)		False Positive Test		
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	NR					False Positive Test		
Uranium-234	NR	1.07				0.75 - 1.39		
Uranium-238	NR	1.05				0.74 - 1.37		
Zinc-65	NR	20.3	N	(25)		14.2 - 26.4		

Radiological Reference Date: August 1, 2019

**Result Flags:**

A = Result acceptable Bias <=20%

W = Result acceptable with warning 20% < Bias < 30%

N = Result not acceptable Bias > 30%

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NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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NOT ACCEPTABLE.....RP>30%

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**Notes:**

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

*Laboratory Results For MAPEP-19-MaW41*

(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	11.1	11.5	A		-3.5	8.1 - 15.0	0.6	A
Arsenic	2.55	2.53	A		0.8	1.77 - 3.29	0.12	A
Barium	1.24	1.32	A		-6.1	0.92 - 1.72	0.06	A
Beryllium	4.76	4.55	A		4.6	3.19 - 5.92	0.48	A
Cadmium	0.425	0.433	A		-1.8	0.303 - 0.563	0.021	A
Chromium	0.000520	0.00061	A			Sensitivity Evaluation	0.000052	
Cobalt	14.0	14.4	A		-2.8	10.1 - 18.7	0.7	A
Copper	15.5	16.1	A		-3.7	11.3 - 20.9	0.8	A
Lead	0.545	0.547	A		-0.4	0.383 - 0.711	0.026	A
Mercury	0.0837	0.0921	A		-9.1	0.0645 - 0.1197	0.0042	A
Nickel	18.0	18.6	A		-3.2	13.0 - 24.2	0.9	A
Selenium	0.517	0.535	A		-3.4	0.375 - 0.696	0.078	W
Technetium-99	NR					False Positive Test		
Thallium	0.0000127		N	(1)		False Positive Test	0.000001	
Uranium-235	0.000686	0.000604	A		13.6	4.23E-4 - 7.85E-4	0.000069	A
Uranium-238	0.0853	0.085	A		0.4	0.060 - 0.111	0.0026	A
Uranium-Total	0.0860	0.085	A		1.2	0.060 - 0.111	0.0026	A
Vanadium	3.01	3.02	A		-0.3	2.11 - 3.93	0.15	A
Zinc	5.55	5.38	A		3.2	3.77 - 6.99	0.56	A

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.522				0.365 - 0.679		
Cesium-134	0.547		A			False Positive Test	0.547	
Cesium-137	18.9	18.4	A		2.7	12.9 - 23.9	0.5	A
Cobalt-57	15.1	15.6	A		-3.2	10.9 - 20.3	0.5	A
Cobalt-60	8.54	8.8	A		-3.0	6.2 - 11.4	0.34	A
Hydrogen-3	183	175	A		4.6	123 - 228	22	A
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	20.4	20.6	A		-1.0	14.4 - 26.8	0.7	A
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	0.71	0.0063	N	(4)		Sensitivity Evaluation	0.05	
Plutonium-239/240	0.80	0.727	A		10.0	0.509 - 0.945	0.05	A
Potassium-40	5.10		A			False Positive Test	5.10	
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	16.2	10.6	N		52.8	7.4 - 13.8	0.6	A
Technetium-99	NR					False Positive Test		
Uranium-234	1.17	1.07	A		9.3	0.75 - 1.39	0.07	A
Uranium-238	1.04	1.05	A		-1.0	0.74 - 1.37	0.07	A
Zinc-65	19.9	20.3	A		-2.0	14.2 - 26.4	1.0	A

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**Notes:**

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- (6) = Not Evaluated
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Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

*Laboratory Results For MAPEP-19-MaW41*

(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	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.508	0.522	A		-2.7	0.365 - 0.679	0.023	A
Cesium-134	-0.42			A		False Positive Test	0.63	
Cesium-137	17.87	18.4	A		-2.9	12.9 - 23.9	0.96	A
Cobalt-57	14.0	15.6	A		-10.3	10.9 - 20.3	0.93	A
Cobalt-60	8.34	8.8	A		-5.2	6.2 - 11.4	0.54	A
Hydrogen-3	NR	175				123 - 228		
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	19.4	20.6	A		-5.8	14.4 - 26.8	1.16	A
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	0.018	0.0063	A			Sensitivity Evaluation	0.004	
Plutonium-239/240	0.671	0.727	A		-7.7	0.509 - 0.945	0.023	A
Potassium-40	-0.3			A		False Positive Test	2.0	
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	9.62	10.6	A		-9.2	7.4 - 13.8	0.19	N
Technetium-99	NR					False Positive Test		
Uranium-234	1.044	1.07	A		-2.4	0.75 - 1.39	0.040	A
Uranium-238	1.027	1.05	A		-2.2	0.74 - 1.37	0.039	A
Zinc-65	19.80	20.3	A		-2.5	14.2 - 26.4	1.16	A

Radiological Reference Date: August 1, 2019

**Result Flags:**

A = Result acceptable Bias <=20%

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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%

RP = Relative Precision

**Notes:**

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

Laboratory Results For MAPEP-19-MaW41  
 (ARSA01) ARS Aleut Analytical, LLC (Luckey)  
 21200 Luckey Rd.  
 Luckey, OH 43443

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	12.1	11.5	A		5.2	8.1 - 15.0	0.0012	N
Arsenic	2.56	2.53	A		1.2	1.77 - 3.29	0.0012	N
Barium	1.23	1.32	A		-6.8	0.92 - 1.72	0.003	N
Beryllium	4.47	4.55	A		-1.8	3.19 - 5.92	0.0108	N
Cadmium	0.417	0.433	A		-3.7	0.303 - 0.563	0.0024	N
Chromium	0.000718	0.00061	A	(17)		Sensitivity Evaluation	0.0488	
Cobalt	NR	14.4				10.1 - 18.7		
Copper	16.6	16.1	A		3.1	11.3 - 20.9	0.0028	N
Lead	0.547	0.547	A		0.0	0.383 - 0.711	0.003	N
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	19.3	18.6	A		3.8	13.0 - 24.2	0.0016	N
Selenium	0.531	0.535	A		-0.7	0.375 - 0.696	0.002	N
Technetium-99	NR					False Positive Test		
Thallium	0.000243		A			False Positive Test	0.0344	
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	0.090	0.085	A		5.9	0.060 - 0.111	0.004	A
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	5.16	5.38	A		-4.1	3.77 - 6.99	0.003	N

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.522				0.365 - 0.679		
Cesium-134	NR					False Positive Test		
Cesium-137	NR	18.4				12.9 - 23.9		
Cobalt-57	NR	15.6				10.9 - 20.3		
Cobalt-60	NR	8.8				6.2 - 11.4		
Hydrogen-3	NR	175				123 - 228		
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	NR	20.6				14.4 - 26.8		
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	NR	0.0063				Sensitivity Evaluation		
Plutonium-239/240	NR	0.727				0.509 - 0.945		
Potassium-40	NR					False Positive Test		
Radium-226	0.174	0.307	N		-43.3	0.215 - 0.399	.095	N

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	NR					False Positive Test		
Uranium-234	1.226	1.07	A		14.6	0.75 - 1.39	0.244	W
Uranium-238	1.293	1.05	W		23.1	0.74 - 1.37	0.253	W
Zinc-65	NR	20.3				14.2 - 26.4		

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**Notes:**

- (1) = False Positive
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- (4) = Sensitivity Evaluation
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte
- (29) = Statistically significant negative value at 3 standard deviations



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

## Laboratory Results For MAPEP-19-MaW41

(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	10.8	11.5	A		-6.1	8.1 - 15.0	1.520	A
Arsenic	2.34	2.53	A		-7.5	1.77 - 3.29	.518	W
Barium	1.19	1.32	A		-9.8	0.92 - 1.72	.170	A
Beryllium	4.31	4.55	A		-5.3	3.19 - 5.92	.564	A
Cadmium	.370	0.433	A		-14.6	0.303 - 0.563	.048	A
Chromium	.00101	0.00061	A			Sensitivity Evaluation	.00012	
Cobalt	14.6	14.4	A		1.4	10.1 - 18.7	2.199	W
Copper	15.0	16.1	A		-6.8	11.3 - 20.9	1.961	A
Lead	.562	0.547	A		2.7	0.383 - 0.711	.078	A
Mercury	.0956	0.0921	A		3.8	0.0645 - 0.1197	.0262	W
Nickel	17.1	18.6	A		-8.1	13.0 - 24.2	2.549	A
Selenium	.492	0.535	A		-8.0	0.375 - 0.696	.067	A
Technetium-99	NR					False Positive Test		
Thallium	.00159		N	(1)		False Positive Test	.0002	
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	.0936	0.085	A		10.1	0.060 - 0.111	.0099	A
Vanadium	2.84	3.02	A		-6.0	2.11 - 3.93	.433	W
Zinc	4.83	5.38	A		-10.2	3.77 - 6.99	.634	A

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	.524	0.522	A		0.4	0.365 - 0.679	.038	A
Cesium-134	-.037		A			False Positive Test	.322	
Cesium-137	19.070	18.4	A		3.6	12.9 - 23.9	.455	A
Cobalt-57	14.546	15.6	A		-6.8	10.9 - 20.3	.503	A
Cobalt-60	8.998	8.8	A		2.3	6.2 - 11.4	.193	A
Hydrogen-3	186.914	175	A		6.8	123 - 228	11.488	A
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	21.115	20.6	A		2.5	14.4 - 26.8	.695	A
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	.004	0.0063	A	(17)		Sensitivity Evaluation	.003	
Plutonium-239/240	.622	0.727	A		-14.4	0.509 - 0.945	.043	A
Potassium-40	1.382		N	(1)		False Positive Test	.401	
Radium-226	6.253	0.307	N		1936.8	0.215 - 0.399	.996	W

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	11.486	10.6	A		8.4	7.4 - 13.8	.878	A
Technetium-99	.210		A			False Positive Test	.117	
Uranium-234	1.119	1.07	A		4.6	0.75 - 1.39	.074	A
Uranium-238	1.108	1.05	A		5.5	0.74 - 1.37	.073	A
Zinc-65	21.128	20.3	A		4.1	14.2 - 26.4	.736	A

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**Notes:**

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

*Laboratory Results For MAPEP-19-MaW41*

(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	11.2	11.5	A		-2.6	8.1 - 15.0	0.591	A
Arsenic	2.52	2.53	A		-0.4	1.77 - 3.29	0.142	A
Barium	1.24	1.32	A		-6.1	0.92 - 1.72	0.050	A
Beryllium	4.41	4.55	A		-3.1	3.19 - 5.92	0.275	A
Cadmium	0.416	0.433	A		-3.9	0.303 - 0.563	0.025	A
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	13.8	14.4	A		-4.2	10.1 - 18.7	0.690	A
Copper	15.6	16.1	A		-3.1	11.3 - 20.9	0.643	A
Lead	0.576	0.547	A		5.3	0.383 - 0.711	0.038	A
Mercury	0.0936	0.0921	A		1.6	0.0645 - 0.1197	0.0071	A
Nickel	18.0	18.6	A		-3.2	13.0 - 24.2	0.889	A
Selenium	0.519	0.535	A		-3.0	0.375 - 0.696	0.0842	W
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	0.0006	0.000604	A		-0.7	4.23E-4 - 7.85E-4	0.00006	A
Uranium-238	0.086	0.085	A		1.2	0.060 - 0.111	0.0086	A
Uranium-Total	0.087	0.085	A		2.4	0.060 - 0.111	0.0087	A
Vanadium	2.99	3.02	A		-1.0	2.11 - 3.93	0.114	A
Zinc	5.19	5.38	A		-3.5	3.77 - 6.99	0.325	A

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.472	0.522	A		-9.6	0.365 - 0.679	0.064	A
Cesium-134	NR			(6)		False Positive Test		
Cesium-137	18.5	18.4	A		0.5	12.9 - 23.9	1.5	A
Cobalt-57	15.5	15.6	A		-0.6	10.9 - 20.3	0.80	A
Cobalt-60	8.84	8.8	A		0.5	6.2 - 11.4	0.91	A
Hydrogen-3	167	175	A		-4.6	123 - 228	17	A
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	21.1	20.6	A		2.4	14.4 - 26.8	3.6	W
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	0.00481	0.0063	A	(17)		Sensitivity Evaluation	0.011	
Plutonium-239/240	0.618	0.727	A		-15.0	0.509 - 0.945	0.056	A
Potassium-40	2.4		A			False Positive Test	2.1	
Radium-226	0.320	0.307	A		4.2	0.215 - 0.399	0.11	N

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	9.07	10.6	A		-14.4	7.4 - 13.8	1.0	A
Technetium-99	0.0376		A			False Positive Test	0.44	
Uranium-234	0.944	1.07	A		-11.8	0.75 - 1.39	0.096	A
Uranium-238	0.966	1.05	A		-8.0	0.74 - 1.37	0.10	A
Zinc-65	20.5	20.3	A		1.0	14.2 - 26.4	3.7	W

Radiological Reference Date: August 1, 2019

**Result Flags:**

A = Result acceptable Bias <=20%

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RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

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

## Laboratory Results For MAPEP-19-MaW41

(BRLL01) Brooks Applied Labs, LLC

18804 North Creek Parkway

Bothell, WA 98011

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	10.8	11.5	A		-6.1	8.1 - 15.0	0.5	A
Arsenic	2.40	2.53	A		-5.1	1.77 - 3.29	0.05	A
Barium	1.30	1.32	A		-1.5	0.92 - 1.72	0.02	N
Beryllium	4.32	4.55	A		-5.1	3.19 - 5.92	0.08	N
Cadmium	0.443	0.433	A		2.3	0.303 - 0.563	0.012	A
Chromium	0.0215	0.00061	N	(4)		Sensitivity Evaluation	.0040	
Cobalt	14.8	14.4	A		2.8	10.1 - 18.7	0.1	N
Copper	16.4	16.1	A		1.9	11.3 - 20.9	0.2	N
Lead	0.551	0.547	A		0.7	0.383 - 0.711	0.022	A
Mercury	0.0955	0.0921	A		3.7	0.0645 - 0.1197	0.0020	A
Nickel	18.7	18.6	A		0.5	13.0 - 24.2	0.4	A
Selenium	0.553	0.535	A		3.4	0.375 - 0.696	0.007	N
Technetium-99	NR					False Positive Test		
Thallium	0.0000847		A			False Positive Test	0.000099	
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	0.0898	0.085	A		5.6	0.060 - 0.111	0.0094	A
Vanadium	3.13	3.02	A		3.6	2.11 - 3.93	0.07	A
Zinc	5.57	5.38	A		3.5	3.77 - 6.99	0.07	N

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.522				0.365 - 0.679		
Cesium-134	NR					False Positive Test		
Cesium-137	NR	18.4				12.9 - 23.9		
Cobalt-57	NR	15.6				10.9 - 20.3		
Cobalt-60	NR	8.8				6.2 - 11.4		
Hydrogen-3	NR	175				123 - 228		
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	NR	20.6				14.4 - 26.8		
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	NR	0.0063				Sensitivity Evaluation		
Plutonium-239/240	NR	0.727				0.509 - 0.945		
Potassium-40	NR					False Positive Test		
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	NR					False Positive Test		
Uranium-234	NR	1.07				0.75 - 1.39		
Uranium-238	NR	1.05				0.74 - 1.37		
Zinc-65	NR	20.3				14.2 - 26.4		

Radiological Reference Date: August 1, 2019

**Result Flags:**

A = Result acceptable Bias <=20%

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NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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- (4) = Sensitivity Evaluation
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Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

*Laboratory Results For MAPEP-19-MaW41*

(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	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.46	0.522	A		-11.9	0.365 - 0.679	0.06	A
Cesium-134	NR			(6)		False Positive Test		
Cesium-137	19.25	18.4	A		4.6	12.9 - 23.9	0.59	A
Cobalt-57	16.10	15.6	A		3.2	10.9 - 20.3	0.30	N
Cobalt-60	8.80	8.8	A		0.0	6.2 - 11.4	0.36	A
Hydrogen-3	NR	175				123 - 228		
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	20.95	20.6	A		1.7	14.4 - 26.8	0.70	A
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	0.015	0.0063	A	(17)		Sensitivity Evaluation	0.008	
Plutonium-239/240	0.661	0.727	A		-9.1	0.509 - 0.945	0.052	A
Potassium-40	-0.07			A		False Positive Test	1.14	
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	9.23	10.6	A		-12.9	7.4 - 13.8	0.36	A
Technetium-99	-0.22		A			False Positive Test	0.16	
Uranium-234	1.120	1.07	A		4.7	0.75 - 1.39	0.079	A
Uranium-238	1.088	1.05	A		3.6	0.74 - 1.37	0.067	A
Zinc-65	21.10	20.3	A		3.9	14.2 - 26.4	0.93	A

Radiological Reference Date: August 1, 2019

**Result Flags:**

A = Result acceptable Bias <=20%

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NR = Not Reported

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- (11) = False Positive Test, Result Not Reported
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Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-19-MaW41  
 (CDHS01) California Department of Public Health  
 Drinking Water & Radiation Lab.  
 Richmond, CA 94804-6403

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	11.7	11.5	A		1.7	8.1 - 15.0	0.42	A
Arsenic	2.45	2.53	A		-3.2	1.77 - 3.29	0.09	A
Barium	1.26	1.32	A		-4.5	0.92 - 1.72	0.04	A
Beryllium	4.51	4.55	A		-0.9	3.19 - 5.92	0.16	A
Cadmium	0.432	0.433	A		-0.2	0.303 - 0.563	0.020	A
Chromium	0.0042	0.00061	N	(4)		Sensitivity Evaluation	0.0001	
Cobalt	14.70	14.4	A		2.1	10.1 - 18.7	0.57	A
Copper	16.50	16.1	A		2.5	11.3 - 20.9	0.61	A
Lead	0.53	0.547	A		-3.1	0.383 - 0.711	0.02	A
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	19.1	18.6	A		2.7	13.0 - 24.2	0.744	A
Selenium	0.533	0.535	A		-0.4	0.375 - 0.696	0.019	A
Technetium-99	NR					False Positive Test		
Thallium	0.00011		N	(1)		False Positive Test	0.00001	
Uranium-235	0.00062	0.000604	A		2.6	4.23E-4 - 7.85E-4	0.00002	A
Uranium-238	0.085	0.085	A		0.0	0.060 - 0.111	0.003	A
Uranium-Total	0.086	0.085	A		1.2	0.060 - 0.111	0.003	A
Vanadium	3.24	3.02	A		7.3	2.11 - 3.93	0.089	A
Zinc	5.4	5.38	A		0.4	3.77 - 6.99	0.2	A

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.466	0.522	A		-10.7	0.365 - 0.679	0.0184	A
Cesium-134	0.003		A			False Positive Test	0.0492	
Cesium-137	19.2	18.4	A		4.3	12.9 - 23.9	0.415	A
Cobalt-57	15.4	15.6	A		-1.3	10.9 - 20.3	0.248	N
Cobalt-60	8.90	8.8	A		1.1	6.2 - 11.4	0.155	N
Hydrogen-3	155	175	A		-11.4	123 - 228	3.915	A
Iron-55	15.04	15.7	A		-4.2	11.0 - 20.4	0.279	N
Manganese-54	21.4	20.6	A		3.9	14.4 - 26.8	0.426	N
Nickel-63	10.76	9.7	A		10.9	6.8 - 12.6	0.574	A
Plutonium-238	0.00340	0.0063	A	(17)		Sensitivity Evaluation	0.00217	
Plutonium-239/240	0.6368	0.727	A		-12.4	0.509 - 0.945	0.017	A
Potassium-40	0.0118		A			False Positive Test	0.793	
Radium-226	0.311	0.307	A		1.3	0.215 - 0.399	0.0356	A

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	8.49	10.6	A		-19.9	7.4 - 13.8	0.336	A
Technetium-99	0.141		A			False Positive Test	0.394	
Uranium-234	1.07	1.07	A		0.0	0.75 - 1.39	0.0716	A
Uranium-238	1.03	1.05	A		-1.9	0.74 - 1.37	0.0687	A
Zinc-65	20.7	20.3	A		2.0	14.2 - 26.4	0.456	A

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**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
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte
- (29) = Statistically significant negative value at 3 standard deviations



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

*Laboratory Results For MAPEP-19-MaW41*

(CEBM01) Cebam Analytical, Inc

11812 North Creek Parkway N

Bothell, WA 98011-8202

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	0.0897	0.0921	A		-2.6	0.0645 - 0.1197	0.0041	A
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.522				0.365 - 0.679		
Cesium-134	NR					False Positive Test		
Cesium-137	NR	18.4				12.9 - 23.9		
Cobalt-57	NR	15.6				10.9 - 20.3		
Cobalt-60	NR	8.8				6.2 - 11.4		
Hydrogen-3	NR	175				123 - 228		
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	NR	20.6				14.4 - 26.8		
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	NR	0.0063				Sensitivity Evaluation		
Plutonium-239/240	NR	0.727				0.509 - 0.945		
Potassium-40	NR					False Positive Test		
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	NR					False Positive Test		
Uranium-234	NR	1.07				0.75 - 1.39		
Uranium-238	NR	1.05				0.74 - 1.37		
Zinc-65	NR	20.3				14.2 - 26.4		

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**Notes:**

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- (11) = False Positive Test, Result Not Reported
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Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

*Laboratory Results For MAPEP-19-MaW41*

(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	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.522				0.365 - 0.679		
Cesium-134	-1.10E+00		A			False Positive Test	3.61	
Cesium-137	1.80E+01	18.4	A		-2.2	12.9 - 23.9	2.74	W
Cobalt-57	1.61E+01	15.6	A		3.2	10.9 - 20.3	1.41	A
Cobalt-60	9.91E+00	8.8	A		12.6	6.2 - 11.4	1.77	W
Hydrogen-3	1.86E+02	175	A		6.3	123 - 228	3.21	N
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	2.05E+01	20.6	A		-0.5	14.4 - 26.8	3.25	W
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	5.18E-03	0.0063	A			Sensitivity Evaluation	9.18E-04	
Plutonium-239/240	6.79E-01	0.727	A		-6.6	0.509 - 0.945	3.23E-02	A
Potassium-40	4.36E+00		A			False Positive Test	3.75	
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	NR					False Positive Test		
Uranium-234	NR	1.07				0.75 - 1.39		
Uranium-238	NR	1.05				0.74 - 1.37		
Zinc-65	1.79E+01	20.3	A		-11.8	14.2 - 26.4	5.32	W

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**Notes:**

- (1) = False Positive
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- (4) = Sensitivity Evaluation
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- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte
- (29) = Statistically significant negative value at 3 standard deviations





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

*Laboratory Results For MAPEP-19-MaW41*

(CHMH01) 222-S Laboratory  
295 Bradley Blvd., Suite 203  
Richland, WA 99352

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	0.0000018		N	(1)		False Positive Test	0.000000	
Thallium	NR					False Positive Test		
Uranium-235	0.0006564	0.000604	A		8.7	4.23E-4 - 7.85E-4	0.000065	A
Uranium-238	0.090528	0.085	A		6.5	0.060 - 0.111	0.00905	A
Uranium-Total	0.09118	0.085	A		7.3	0.060 - 0.111	0.009118	A
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	.4773	0.522	A		-8.6	0.365 - 0.679	.0714	A
Cesium-134	.7419		A			False Positive Test	.725	
Cesium-137	20.18	18.4	A		9.7	12.9 - 23.9	1.10	A
Cobalt-57	14.71	15.6	A		-5.7	10.9 - 20.3	.655	A
Cobalt-60	9.953	8.8	A		13.1	6.2 - 11.4	.518	A
Hydrogen-3	166.5	175	A		-4.9	123 - 228	16.7	A
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	21.67	20.6	A		5.2	14.4 - 26.8	.944	A
Nickel-63	10.21	9.7	A		5.3	6.8 - 12.6	1.82	W
Plutonium-238	.004521	0.0063	A	(17)		Sensitivity Evaluation	.00266	
Plutonium-239/240	0.7197	0.727	A		-1.0	0.509 - 0.945	0.108	W
Potassium-40	-4.181		A			False Positive Test	18.3	
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	10.98	10.6	A		3.6	7.4 - 13.8	.616	A
Technetium-99	0.2113		A			False Positive Test	0.515	
Uranium-234	NR	1.07				0.75 - 1.39		
Uranium-238	NR	1.05				0.74 - 1.37		
Zinc-65	21.74	20.3	A		7.1	14.2 - 26.4	1.24	A

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**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
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte
- (29) = Statistically significant negative value at 3 standard deviations



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

*Laboratory Results For MAPEP-19-MaW41*

(CMRC01) Carlsbad Environmental Monitoring and Research Center

1400 University Dr.

Carlsbad, NM 88220

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	4.56E-01	0.522	A		-12.6	0.365 - 0.679	3.02E-02	A
Cesium-134	1.45E-01			A		False Positive Test	4.72E-01	
Cesium-137	1.93E+01	18.4	A		4.9	12.9 - 23.9	7.92E-01	A
Cobalt-57	1.65E+01	15.6	A		5.8	10.9 - 20.3	5.23E-01	A
Cobalt-60	8.77E+00	8.8	A		-0.3	6.2 - 11.4	5.13E-01	A
Hydrogen-3	NR	175				123 - 228		
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	2.14E+01	20.6	A		3.9	14.4 - 26.8	8.30E-01	A
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	5.66E-03	0.0063	A	(17)		Sensitivity Evaluation	1.12E-01	
Plutonium-239/240	6.55E-01	0.727	A		-9.9	0.509 - 0.945	5.25E-02	A
Potassium-40	1.10E+00			A		False Positive Test	5.65	
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	NR					False Positive Test		
Uranium-234	7.96E-01	1.07	W		-25.6	0.75 - 1.39	5.41E-02	A
Uranium-238	7.81E-01	1.05	W		-25.6	0.74 - 1.37	5.31E-02	A
Zinc-65	2.30E+01	20.3	A		13.3	14.2 - 26.4	1.62	A

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**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
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte
- (29) = Statistically significant negative value at 3 standard deviations



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

Laboratory Results For MAPEP-19-MaW41  
 (COPS99) Health Canada Radiation Protection Bureau  
 2720 Riverside drive  
 Ottawa, Ontario K1A0K9

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	1.69	0.522	N		223.8	0.365 - 0.679	0.24	A
Cesium-134	0.939		N	(1)		False Positive Test	0.19	
Cesium-137	18.5	18.4	A		0.5	12.9 - 23.9	0.94	A
Cobalt-57	15.7	15.6	A		0.6	10.9 - 20.3	0.4	A
Cobalt-60	8.57	8.8	A		-2.6	6.2 - 11.4	0.6	A
Hydrogen-3	NR	175				123 - 228		
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	21.1	20.6	A		2.4	14.4 - 26.8	0.49	A
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	NR	0.0063				Sensitivity Evaluation		
Plutonium-239/240	NR	0.727				0.509 - 0.945		
Potassium-40	3720		N	(1)		False Positive Test	11	
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	NR					False Positive Test		
Uranium-234	NR	1.07				0.75 - 1.39		
Uranium-238	NR	1.05				0.74 - 1.37		
Zinc-65	20.3	20.3	A		0.0	14.2 - 26.4	1.18	A

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**Notes:**

- (1) = False Positive
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- (4) = Sensitivity Evaluation
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (25) = Result not reported with other gamma results
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- (29) = Statistically significant negative value at 3 standard deviations



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

## Laboratory Results For MAPEP-19-MaW41

(CORE02) TestAmerica Denver

4955 Yarrow St

Arvada, CO 80002

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	11.6	11.5	A		0.9	8.1 - 15.0	5.80	N
Arsenic	2.44	2.53	A		-3.6	1.77 - 3.29	0.0895	A
Barium	1.27	1.32	A		-3.8	0.92 - 1.72	0.466	N
Beryllium	4.61	4.55	A		1.3	3.19 - 5.92	0.184	A
Cadmium	0.440	0.433	A		1.6	0.303 - 0.563	0.0161	A
Chromium	-0.000019	0.00061	N	(29)		Sensitivity Evaluation	0.000001	
Cobalt	14.7	14.4	A		2.1	10.1 - 18.7	0.539	A
Copper	16.2	16.1	A		0.6	11.3 - 20.9	0.702	A
Lead	0.544	0.547	A		-0.5	0.383 - 0.711	0.0426	A
Mercury	0.0870	0.0921	A		-5.5	0.0645 - 0.1197	0.0141	W
Nickel	18.7	18.6	A		0.5	13.0 - 24.2	0.686	A
Selenium	0.495	0.535	A		-7.5	0.375 - 0.696	0.0371	A
Technetium-99	NR					False Positive Test		
Thallium	0.000054		N	(1)		False Positive Test	0.000002	
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	0.0875	0.085	A		2.9	0.060 - 0.111	0.0038	A
Vanadium	3.05	3.02	A		1.0	2.11 - 3.93	0.107	A
Zinc	5.29	5.38	A		-1.7	3.77 - 6.99	0.229	A

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.522				0.365 - 0.679		
Cesium-134	NR					False Positive Test		
Cesium-137	NR	18.4				12.9 - 23.9		
Cobalt-57	NR	15.6				10.9 - 20.3		
Cobalt-60	NR	8.8				6.2 - 11.4		
Hydrogen-3	NR	175				123 - 228		
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	NR	20.6				14.4 - 26.8		
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	NR	0.0063				Sensitivity Evaluation		
Plutonium-239/240	NR	0.727				0.509 - 0.945		
Potassium-40	NR					False Positive Test		
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	NR					False Positive Test		
Uranium-234	NR	1.07				0.75 - 1.39		
Uranium-238	NR	1.05				0.74 - 1.37		
Zinc-65	NR	20.3				14.2 - 26.4		

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**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
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte
- (29) = Statistically significant negative value at 3 standard deviations





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

Laboratory Results For MAPEP-19-MaW41  
 (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	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.522				0.365 - 0.679		
Cesium-134	0.3		A			False Positive Test	0.5	
Cesium-137	19.44	18.4	A		5.7	12.9 - 23.9	0.43	A
Cobalt-57	16.55	15.6	A		6.1	10.9 - 20.3	0.32	N
Cobalt-60	8.78	8.8	A		-0.2	6.2 - 11.4	0.53	A
Hydrogen-3	NR	175				123 - 228		
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	18.85	20.6	A		-8.5	14.4 - 26.8	0.42	A
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	NR	0.0063				Sensitivity Evaluation		
Plutonium-239/240	NR	0.727				0.509 - 0.945		
Potassium-40	NR		N	(11)		False Positive Test		
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	NR					False Positive Test		
Uranium-234	NR	1.07				0.75 - 1.39		
Uranium-238	NR	1.05				0.74 - 1.37		
Zinc-65	21.01	20.3	A		3.5	14.2 - 26.4	1.03	A

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**Notes:**

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- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
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Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

*Laboratory Results For MAPEP-19-MaW41*

(DLEA01) DLE Associates

730 Alfred Nobel Drive

Hercules, CA 94547

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	0.062	0.085	W		-27.1	0.060 - 0.111	0.010	W
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.522				0.365 - 0.679		
Cesium-134	0.66		A			False Positive Test	0.72	
Cesium-137	16.78	18.4	A		-8.8	12.9 - 23.9	0.51	A
Cobalt-57	13.27	15.6	A		-14.9	10.9 - 20.3	0.22	N
Cobalt-60	8.27	8.8	A		-6.0	6.2 - 11.4	0.41	A
Hydrogen-3	204.09	175	A		16.6	123 - 228	12.99	A
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	18.82	20.6	A		-8.6	14.4 - 26.8	0.65	A
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	NR	0.0063				Sensitivity Evaluation		
Plutonium-239/240	NR	0.727				0.509 - 0.945		
Potassium-40	6.01		A			False Positive Test	7.24	
Radium-226	0.38	0.307	W		23.8	0.215 - 0.399	0.02	A

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	7.85	10.6	W		-25.9	7.4 - 13.8	0.32	A
Technetium-99	NR					False Positive Test		
Uranium-234	NR	1.07				0.75 - 1.39		
Uranium-238	NR	1.05				0.74 - 1.37		
Zinc-65	23.02	20.3	A		13.4	14.2 - 26.4	1.51	A

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**Notes:**

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- (4) = Sensitivity Evaluation
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- (28) = Not Reporting Previously Reported Analyte
- (29) = Statistically significant negative value at 3 standard deviations



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

Laboratory Results For MAPEP-19-MaW41  
 (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	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	0.0975	0.0921	A		5.9	0.0645 - 0.1197	0.022	W
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.522				0.365 - 0.679		
Cesium-134	NR					False Positive Test		
Cesium-137	NR	18.4				12.9 - 23.9		
Cobalt-57	NR	15.6				10.9 - 20.3		
Cobalt-60	NR	8.8				6.2 - 11.4		
Hydrogen-3	NR	175				123 - 228		
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	NR	20.6				14.4 - 26.8		
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	NR	0.0063				Sensitivity Evaluation		
Plutonium-239/240	NR	0.727				0.509 - 0.945		
Potassium-40	NR					False Positive Test		
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	NR					False Positive Test		
Uranium-234	NR	1.07				0.75 - 1.39		
Uranium-238	NR	1.05				0.74 - 1.37		
Zinc-65	NR	20.3				14.2 - 26.4		

Radiological Reference Date: August 1, 2019

**Result 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:**

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ACCEPTABLE.....2%<=RP<=15%

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

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- (4) = Sensitivity Evaluation
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- (29) = Statistically significant negative value at 3 standard deviations



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

*Laboratory Results For MAPEP-19-MaW41*

(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	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.522				0.365 - 0.679		
Cesium-134	NR					False Positive Test		
Cesium-137	NR	18.4				12.9 - 23.9		
Cobalt-57	NR	15.6				10.9 - 20.3		
Cobalt-60	NR	8.8				6.2 - 11.4		
Hydrogen-3	NR	175				123 - 228		
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	NR	20.6				14.4 - 26.8		
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	NR	0.0063				Sensitivity Evaluation		
Plutonium-239/240	NR	0.727				0.509 - 0.945		
Potassium-40	NR					False Positive Test		
Radium-226	0.228	0.307	W		-25.7	0.215 - 0.399	0.0250	A

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	NR					False Positive Test		
Uranium-234	1.05	1.07	A		-1.9	0.75 - 1.39	0.102	A
Uranium-238	1.11	1.05	A		5.7	0.74 - 1.37	0.108	A
Zinc-65	NR	20.3				14.2 - 26.4		

Radiological Reference Date: August 1, 2019

**Result 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%

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**Notes:**

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- (4) = Sensitivity Evaluation
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
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Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

*Laboratory Results For MAPEP-19-MaW41*

(EMAX01) EMAX Laboratories, Inc

1835 W. 205th St.

Torrance, CA 90501

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	10.9	11.5	A		-5.2	8.1 - 15.0	0.0081	N
Arsenic	2.40	2.53	A		-5.1	1.77 - 3.29	0.0455	N
Barium	1.20	1.32	A		-9.1	0.92 - 1.72	0.008	N
Beryllium	4.19	4.55	A		-7.9	3.19 - 5.92	0.0012	N
Cadmium	0.418	0.433	A		-3.5	0.303 - 0.563	0.00249	N
Chromium	0.00147	0.00061	A	(17)		Sensitivity Evaluation	0.0016	
Cobalt	13.6	14.4	A		-5.6	10.1 - 18.7	0.0034	N
Copper	15	16.1	A		-6.8	11.3 - 20.9	0.0585	N
Lead	0.522	0.547	A		-4.6	0.383 - 0.711	0.0100	N
Mercury	0.0968	0.0921	A		5.1	0.0645 - 0.1197	0.000141	N
Nickel	17.6	18.6	A		-5.4	13.0 - 24.2	0.0155	N
Selenium	0.527	0.535	A		-1.5	0.375 - 0.696	0.0043	N
Technetium-99	NR					False Positive Test		
Thallium	0.00665		A			False Positive Test	0.0106	
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	0.0803	0.085	A		-5.5	0.060 - 0.111	0.000435	N
Vanadium	2.95	3.02	A		-2.3	2.11 - 3.93	0.104	A
Zinc	5.30	5.38	A		-1.5	3.77 - 6.99	0.040	N

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.522				0.365 - 0.679		
Cesium-134	NR					False Positive Test		
Cesium-137	NR	18.4				12.9 - 23.9		
Cobalt-57	NR	15.6				10.9 - 20.3		
Cobalt-60	NR	8.8				6.2 - 11.4		
Hydrogen-3	NR	175				123 - 228		
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	NR	20.6				14.4 - 26.8		
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	NR	0.0063				Sensitivity Evaluation		
Plutonium-239/240	NR	0.727				0.509 - 0.945		
Potassium-40	NR					False Positive Test		
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	NR					False Positive Test		
Uranium-234	NR	1.07				0.75 - 1.39		
Uranium-238	NR	1.05				0.74 - 1.37		
Zinc-65	NR	20.3				14.2 - 26.4		

Radiological Reference Date: August 1, 2019

**Result Flags:**

A = Result acceptable Bias <=20%

W = Result acceptable with warning 20% < Bias < 30%

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RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

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ACCEPTABLE.....2%<=RP<=15%

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NOT ACCEPTABLE.....RP>30%

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**Notes:**

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- (4) = Sensitivity Evaluation
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
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- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte
- (29) = Statistically significant negative value at 3 standard deviations



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

Laboratory Results For MAPEP-19-MaW41  
 (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	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	0.000611	0.000604	A		1.2	4.23E-4 - 7.85E-4	0.000016	A
Uranium-238	0.0842	0.085	A		-0.9	0.060 - 0.111	0.0020	A
Uranium-Total	0.0848	0.085	A		-0.2	0.060 - 0.111	0.0020	A
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.522				0.365 - 0.679		
Cesium-134	NR					False Positive Test		
Cesium-137	NR	18.4				12.9 - 23.9		
Cobalt-57	NR	15.6				10.9 - 20.3		
Cobalt-60	NR	8.8				6.2 - 11.4		
Hydrogen-3	NR	175				123 - 228		
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	NR	20.6				14.4 - 26.8		
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	NR	0.0063				Sensitivity Evaluation		
Plutonium-239/240	NR	0.727				0.509 - 0.945		
Potassium-40	NR					False Positive Test		
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	NR					False Positive Test		
Uranium-234	NR	1.07				0.75 - 1.39		
Uranium-238	NR	1.05				0.74 - 1.37		
Zinc-65	NR	20.3				14.2 - 26.4		

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**Notes:**

- (1) = False Positive
- (2) = False Negative
- (4) = Sensitivity Evaluation
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
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- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte
- (29) = Statistically significant negative value at 3 standard deviations



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

Laboratory Results For MAPEP-19-MaW41  
 (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	10.8	11.5	A		-6.1	8.1 - 15.0	0.6	A
Arsenic	2.36	2.53	A		-6.7	1.77 - 3.29	0.12	A
Barium	1.19	1.32	A		-9.8	0.92 - 1.72	0.06	A
Beryllium	3.91	4.55	A		-14.1	3.19 - 5.92	0.20	A
Cadmium	0.406	0.433	A		-6.2	0.303 - 0.563	0.021	A
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	14.2	14.4	A		-1.4	10.1 - 18.7	0.7	A
Copper	15.5	16.1	A		-3.7	11.3 - 20.9	0.8	A
Lead	0.530	0.547	A		-3.1	0.383 - 0.711	0.027	A
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	18.4	18.6	A		-1.1	13.0 - 24.2	0.9	A
Selenium	0.538	0.535	A		0.6	0.375 - 0.696	0.028	A
Technetium-99	NR					False Positive Test		
Thallium	0.0000002		A			False Positive Test	0.00066	
Uranium-235	0.00062	0.000604	A		2.6	4.23E-4 - 7.85E-4	0.00011	W
Uranium-238	0.0907	0.085	A		6.7	0.060 - 0.111	0.0007	N
Uranium-Total	0.0913	0.085	A		7.4	0.060 - 0.111	0.0007	N
Vanadium	2.93	3.02	A		-3.0	2.11 - 3.93	0.15	A
Zinc	5.17	5.38	A		-3.9	3.77 - 6.99	0.26	A

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.500	0.522	A		-4.2	0.365 - 0.679	0.028	A
Cesium-134	-0.24		A			False Positive Test	0.12	
Cesium-137	18.6	18.4	A		1.1	12.9 - 23.9	0.3	N
Cobalt-57	15.5	15.6	A		-0.6	10.9 - 20.3	0.3	N
Cobalt-60	9.14	8.8	A		3.9	6.2 - 11.4	0.17	N
Hydrogen-3	171	175	A		-2.3	123 - 228	5	A
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	20.5	20.6	A		-0.5	14.4 - 26.8	0.3	N
Nickel-63	9.1	9.7	A		-6.2	6.8 - 12.6	1.4	W
Plutonium-238	0.0044	0.0063	A	(17)		Sensitivity Evaluation	0.0042	
Plutonium-239/240	0.666	0.727	A		-8.4	0.509 - 0.945	0.030	A
Potassium-40	1.7		A			False Positive Test	1.7	
Radium-226	0.300	0.307	A		-2.3	0.215 - 0.399	0.051	W

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	10.0	10.6	A		-5.7	7.4 - 13.8	0.5	A
Technetium-99	0.21		A			False Positive Test	0.12	
Uranium-234	1.11	1.07	A		3.7	0.75 - 1.39	0.05	A
Uranium-238	1.05	1.05	A		0.0	0.74 - 1.37	0.05	A
Zinc-65	20.1	20.3	A		-1.0	14.2 - 26.4	0.5	A

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**Notes:**

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

*Laboratory Results For MAPEP-19-MaW41*

(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	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.522				0.365 - 0.679		
Cesium-134	NR					False Positive Test		
Cesium-137	NR	18.4				12.9 - 23.9		
Cobalt-57	NR	15.6				10.9 - 20.3		
Cobalt-60	NR	8.8				6.2 - 11.4		
Hydrogen-3	175	175	A		0.0	123 - 228	7	A
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	NR	20.6				14.4 - 26.8		
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	NR	0.0063				Sensitivity Evaluation		
Plutonium-239/240	NR	0.727				0.509 - 0.945		
Potassium-40	NR					False Positive Test		
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	NR					False Positive Test		
Uranium-234	NR	1.07				0.75 - 1.39		
Uranium-238	NR	1.05				0.74 - 1.37		
Zinc-65	NR	20.3				14.2 - 26.4		

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**Notes:**

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

Laboratory Results For MAPEP-19-MaW41

(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	11.67	11.5	A		1.5	8.1 - 15.0	0.584	A
Arsenic	2.53	2.53	A		0.0	1.77 - 3.29	0.116	A
Barium	1.30	1.32	A		-1.5	0.92 - 1.72	0.032	A
Beryllium	5.12	4.55	A		12.5	3.19 - 5.92	0.322	A
Cadmium	0.42	0.433	A		-3.0	0.303 - 0.563	0.011	A
Chromium	0.01	0.00061	N	(4)		Sensitivity Evaluation	0.001	
Cobalt	14.60	14.4	A		1.4	10.1 - 18.7	1.159	A
Copper	18.06	16.1	A		12.2	11.3 - 20.9	1.209	A
Lead	0.61	0.547	A		11.5	0.383 - 0.711	0.035	A
Mercury	0.102	0.0921	A		10.7	0.0645 - 0.1197	0.010	A
Nickel	20.50	18.6	A		10.2	13.0 - 24.2	0.410	A
Selenium	0.70	0.535	N		30.8	0.375 - 0.696	0.091	A
Technetium-99	0.0000006		A			False Positive Test	0.0001	
Thallium	0.01		N	(1)		False Positive Test	0.001	
Uranium-235	0.00046	0.000604	W		-23.8	4.23E-4 - 7.85E-4	0.00001	A
Uranium-238	0.0615	0.085	W		-27.6	0.060 - 0.111	0.023	N
Uranium-Total	0.06195	0.085	W		-27.1	0.060 - 0.111	0.001	N
Vanadium	3.87	3.02	W		28.1	2.11 - 3.93	0.173	A
Zinc	5.43	5.38	A		0.9	3.77 - 6.99	0.25	A

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.522				0.365 - 0.679		
Cesium-134	NR					False Positive Test		
Cesium-137	NR	18.4				12.9 - 23.9		
Cobalt-57	NR	15.6				10.9 - 20.3		
Cobalt-60	NR	8.8				6.2 - 11.4		
Hydrogen-3	NR	175				123 - 228		
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	NR	20.6				14.4 - 26.8		
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	NR	0.0063				Sensitivity Evaluation		
Plutonium-239/240	NR	0.727				0.509 - 0.945		
Potassium-40	NR					False Positive Test		
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	1.14		N	(1)		False Positive Test	0.03	
Uranium-234	NR	1.07				0.75 - 1.39		
Uranium-238	NR	1.05				0.74 - 1.37		
Zinc-65	NR	20.3				14.2 - 26.4		

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**Notes:**

- (1) = False Positive
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- (4) = Sensitivity Evaluation
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- (11) = False Positive Test, Result Not Reported
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Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

## Laboratory Results For MAPEP-19-MaW41

(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	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	.203	0.522	N		-61.1	0.365 - 0.679	.182	N
Cesium-134	.361		A			False Positive Test	.27	
Cesium-137	17.029	18.4	A		-7.5	12.9 - 23.9	2.078	A
Cobalt-57	14.393	15.6	A		-7.7	10.9 - 20.3	2.084	A
Cobalt-60	7.567	8.8	A		-14.0	6.2 - 11.4	0.476	A
Hydrogen-3	NR	175				123 - 228		
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	18.768	20.6	A		-8.9	14.4 - 26.8	1.963	A
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	NR	0.0063				Sensitivity Evaluation		
Plutonium-239/240	NR	0.727				0.509 - 0.945		
Potassium-40	4.69		A			False Positive Test	4.1	
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	NR					False Positive Test		
Uranium-234	NR	1.07				0.75 - 1.39		
Uranium-238	NR	1.05				0.74 - 1.37		
Zinc-65	18.334	20.3	A		-9.7	14.2 - 26.4	1.628	A

Radiological Reference Date: August 1, 2019

**Result Flags:**

A = Result acceptable Bias <=20%

W = Result acceptable with warning 20% < Bias < 30%

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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%

RP = Relative Precision

**Notes:**

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

*Laboratory Results For MAPEP-19-MaW41*

(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	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.609	0.522	A		16.7	0.365 - 0.679	1.821	N
Cesium-134	0.047			A		False Positive Test	0.428	
Cesium-137	19.275	18.4	A		4.8	12.9 - 23.9	0.614	A
Cobalt-57	15.613	15.6	A		0.1	10.9 - 20.3	0.360	A
Cobalt-60	8.786	8.8	A		-0.2	6.2 - 11.4	0.273	A
Hydrogen-3	189.51	175	A		8.3	123 - 228	3.02	N
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	21.150	20.6	A		2.7	14.4 - 26.8	0.623	A
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	0.0093	0.0063	A			Sensitivity Evaluation	0.0024	
Plutonium-239/240	0.6043	0.727	A		-16.9	0.509 - 0.945	0.0328	A
Potassium-40	1.092			A		False Positive Test	1.113	
Radium-226	0.305	0.307	A		-0.7	0.215 - 0.399	0.120	N

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	9.549	10.6	A		-9.9	7.4 - 13.8	0.558	A
Technetium-99	NR					False Positive Test		
Uranium-234	1.053	1.07	A		-1.6	0.75 - 1.39	0.152	A
Uranium-238	0.974	1.05	A		-7.2	0.74 - 1.37	0.147	W
Zinc-65	21.950	20.3	A		8.1	14.2 - 26.4	0.773	A

Radiological Reference Date: August 1, 2019

**Result Flags:**

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**Notes:**

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- (11) = False Positive Test, Result Not Reported
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Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

*Laboratory Results For MAPEP-19-MaW41*

(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	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.604	0.522	A		15.7	0.365 - 0.679	0.137	W
Cesium-134	0.062			A		False Positive Test	0.2	
Cesium-137	18.095	18.4	A		-1.7	12.9 - 23.9	0.393	A
Cobalt-57	14.753	15.6	A		-5.4	10.9 - 20.3	0.242	N
Cobalt-60	8.56	8.8	A		-2.7	6.2 - 11.4	0.174	A
Hydrogen-3	NR	175				123 - 228		
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	20.591	20.6	A		0.0	14.4 - 26.8	0.385	N
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	NR	0.0063				Sensitivity Evaluation		
Plutonium-239/240	NR	0.727				0.509 - 0.945		
Potassium-40	1.045			A		False Positive Test	0.613	
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	NR					False Positive Test		
Uranium-234	NR	1.07				0.75 - 1.39		
Uranium-238	1.048	1.05	A		-0.2	0.74 - 1.37	0.951	N
Zinc-65	20.914	20.3	A		3.0	14.2 - 26.4	0.599	A

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**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
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte
- (29) = Statistically significant negative value at 3 standard deviations





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

*Laboratory Results For MAPEP-19-MaW41*

(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	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	0.08808	0.085	A		3.6	0.060 - 0.111	0.009	A
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.522				0.365 - 0.679		
Cesium-134	NR					False Positive Test		
Cesium-137	NR	18.4				12.9 - 23.9		
Cobalt-57	NR	15.6				10.9 - 20.3		
Cobalt-60	NR	8.8				6.2 - 11.4		
Hydrogen-3	NR	175				123 - 228		
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	NR	20.6				14.4 - 26.8		
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	NR	0.0063				Sensitivity Evaluation		
Plutonium-239/240	NR	0.727				0.509 - 0.945		
Potassium-40	NR					False Positive Test		
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	NR					False Positive Test		
Uranium-234	NR	1.07				0.75 - 1.39		
Uranium-238	NR	1.05				0.74 - 1.37		
Zinc-65	NR	20.3				14.2 - 26.4		

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**Notes:**

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- (29) = Statistically significant negative value at 3 standard deviations



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

*Laboratory Results For MAPEP-19-MaW41*

(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	10.9	11.5	A		-5.2	8.1 - 15.0	2.17	W
Arsenic	2.41	2.53	A		-4.7	1.77 - 3.29	0.481	W
Barium	1.18	1.32	A		-10.6	0.92 - 1.72	0.236	W
Beryllium	4.19	4.55	A		-7.9	3.19 - 5.92	0.839	W
Cadmium	0.398	0.433	A		-8.1	0.303 - 0.563	0.0796	W
Chromium	0.00231	0.00061	A			Sensitivity Evaluation	0.00057	
Cobalt	13.6	14.4	A		-5.6	10.1 - 18.7	2.72	W
Copper	15.5	16.1	A		-3.7	11.3 - 20.9	3.11	W
Lead	0.507	0.547	A		-7.3	0.383 - 0.711	0.102	W
Mercury	0.092	0.0921	A		-0.1	0.0645 - 0.1197	0.0184	W
Nickel	17.5	18.6	A		-5.9	13.0 - 24.2	3.51	W
Selenium	0.470	0.535	A		-12.2	0.375 - 0.696	0.094	W
Technetium-99	-3.26E-7		A			False Positive Test	4.60E-7	
Thallium	0.0714		N	(1)		False Positive Test	0.0219	
Uranium-235	0.00062	0.000604	A		2.6	4.23E-4 - 7.85E-4	0.000124	W
Uranium-238	0.0858	0.085	A		0.9	0.060 - 0.111	0.0172	W
Uranium-Total	0.0864	0.085	A		1.6	0.060 - 0.111	0.0173	W
Vanadium	2.93	3.02	A		-3.0	2.11 - 3.93	0.587	W
Zinc	5.15	5.38	A		-4.3	3.77 - 6.99	1.03	W

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.511	0.522	A		-2.1	0.365 - 0.679	0.0319	A
Cesium-134	0.0266		A			False Positive Test	0.0576	
Cesium-137	19.7	18.4	A		7.1	12.9 - 23.9	0.965	A
Cobalt-57	16.2	15.6	A		3.8	10.9 - 20.3	0.692	A
Cobalt-60	9.01	8.8	A		2.4	6.2 - 11.4	0.441	A
Hydrogen-3	166	175	A		-5.1	123 - 228	17.0	A
Iron-55	13.8	15.7	A		-12.1	11.0 - 20.4	2.29	W
Manganese-54	22.6	20.6	A		9.7	14.4 - 26.8	1.07	A
Nickel-63	9.26	9.7	A		-4.5	6.8 - 12.6	1.06	A
Plutonium-238	0.0164	0.0063	A	(17)		Sensitivity Evaluation	7.91E-3	
Plutonium-239/240	0.701	0.727	A		-3.6	0.509 - 0.945	0.0519	A
Potassium-40	-0.121		A			False Positive Test	0.799	
Radium-226	0.481	0.307	N		56.7	0.215 - 0.399	0.0625	A

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	9.34	10.6	A		-11.9	7.4 - 13.8	0.765	A
Technetium-99	0.119		A			False Positive Test	0.345	
Uranium-234	1.09	1.07	A		1.9	0.75 - 1.39	0.0657	A
Uranium-238	1.12	1.05	A		6.7	0.74 - 1.37	0.0666	A
Zinc-65	23.1	20.3	A		13.8	14.2 - 26.4	1.07	A

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**Notes:**

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- (4) = Sensitivity Evaluation
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- (28) = Not Reporting Previously Reported Analyte
- (29) = Statistically significant negative value at 3 standard deviations



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

Laboratory Results For MAPEP-19-MaW41  
 (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	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.522				0.365 - 0.679		
Cesium-134	NR		N	(11)		False Positive Test		
Cesium-137	20.34	18.4	A		10.5	12.9 - 23.9	1.63	A
Cobalt-57	16.41	15.6	A		5.2	10.9 - 20.3	1.52	A
Cobalt-60	9.17	8.8	A		4.2	6.2 - 11.4	0.75	A
Hydrogen-3	184.71	175	A		5.5	123 - 228	16.81	A
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	22.11	20.6	A		7.3	14.4 - 26.8	1.79	A
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	NR	0.0063				Sensitivity Evaluation		
Plutonium-239/240	NR	0.727				0.509 - 0.945		
Potassium-40	0.48			A		False Positive Test	2.55	
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	10.26	10.6	A		-3.2	7.4 - 13.8	0.47	A
Technetium-99	NR					False Positive Test		
Uranium-234	NR	1.07				0.75 - 1.39		
Uranium-238	NR	1.05				0.74 - 1.37		
Zinc-65	21.74	20.3	A		7.1	14.2 - 26.4	2.06	A

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**Notes:**

- (1) = False Positive
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- (11) = False Positive Test, Result Not Reported
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- (29) = Statistically significant negative value at 3 standard deviations



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

Laboratory Results For MAPEP-19-MaW41  
 (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	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.522				0.365 - 0.679		
Cesium-134	NR					False Positive Test		
Cesium-137	NR	18.4				12.9 - 23.9		
Cobalt-57	NR	15.6				10.9 - 20.3		
Cobalt-60	NR	8.8				6.2 - 11.4		
Hydrogen-3	177	175	A		1.1	123 - 228	10	A
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	NR	20.6				14.4 - 26.8		
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	NR	0.0063				Sensitivity Evaluation		
Plutonium-239/240	NR	0.727				0.509 - 0.945		
Potassium-40	NR					False Positive Test		
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	NR					False Positive Test		
Uranium-234	NR	1.07				0.75 - 1.39		
Uranium-238	NR	1.05				0.74 - 1.37		
Zinc-65	NR	20.3				14.2 - 26.4		

Radiological Reference Date: August 1, 2019

**Result 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%

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**Notes:**

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- (4) = Sensitivity Evaluation
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Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

*Laboratory Results For MAPEP-19-MaW41*

(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	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.522				0.365 - 0.679		
Cesium-134	-0.1991		A			False Positive Test	0.2610	
Cesium-137	19.28	18.4	A		4.8	12.9 - 23.9	1.700	A
Cobalt-57	15.23	15.6	A		-2.4	10.9 - 20.3	1.130	A
Cobalt-60	8.820	8.8	A		0.2	6.2 - 11.4	0.5561	A
Hydrogen-3	174.26	175	A		-0.4	123 - 228	7.42	A
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	21.18	20.6	A		2.8	14.4 - 26.8	1.993	A
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	NR	0.0063				Sensitivity Evaluation		
Plutonium-239/240	NR	0.727				0.509 - 0.945		
Potassium-40	7.346		N	(1)		False Positive Test	1.403	
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	NR					False Positive Test		
Uranium-234	NR	1.07				0.75 - 1.39		
Uranium-238	NR	1.05				0.74 - 1.37		
Zinc-65	21.91	20.3	A		7.9	14.2 - 26.4	1.996	A

Radiological Reference Date: August 1, 2019

**Result Flags:**

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RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

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- (11) = False Positive Test, Result Not Reported
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Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

## Laboratory Results For MAPEP-19-MaW41

(HPAC99) PHE, CRCE Glasgow

155 Hardgate Road

Glasgow, Scotland G514LS

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.522				0.365 - 0.679		
Cesium-134	0.7		A			False Positive Test	1.0	
Cesium-137	16.8	18.4	A		-8.7	12.9 - 23.9	1.2	A
Cobalt-57	14.7	15.6	A		-5.8	10.9 - 20.3	1.0	A
Cobalt-60	8.59	8.8	A		-2.4	6.2 - 11.4	0.6	A
Hydrogen-3	NR	175				123 - 228		
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	19.6	20.6	A		-4.9	14.4 - 26.8	1.3	A
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	NR	0.0063				Sensitivity Evaluation		
Plutonium-239/240	NR	0.727				0.509 - 0.945		
Potassium-40	3.9		A			False Positive Test	4.0	
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	NR					False Positive Test		
Uranium-234	NR	1.07				0.75 - 1.39		
Uranium-238	NR	1.05				0.74 - 1.37		
Zinc-65	19.2	20.3	A		-5.4	14.2 - 26.4	1.6	A

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**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
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte
- (29) = Statistically significant negative value at 3 standard deviations



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

Laboratory Results For MAPEP-19-MaW41  
 (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	11.5				8.1 - 15.0		
Arsenic	2.61	2.53	A		3.2	1.77 - 3.29	0.10	A
Barium	1.29	1.32	A		-2.3	0.92 - 1.72	0.06	A
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	0.453	0.433	A		4.6	0.303 - 0.563	0.018	A
Chromium	0.007	0.00061	A	(17)		Sensitivity Evaluation	0.007	
Cobalt	14.5	14.4	A		0.7	10.1 - 18.7	0.5	A
Copper	16.3	16.1	A		1.2	11.3 - 20.9	0.6	A
Lead	0.589	0.547	A		7.7	0.383 - 0.711	0.030	A
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	19.0	18.6	A		2.2	13.0 - 24.2	0.7	A
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	5.40	5.38	A		0.4	3.77 - 6.99	0.24	A

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.50	0.522	A		-4.2	0.365 - 0.679	0.04	A
Cesium-134	-0.2		A			False Positive Test	0.4	
Cesium-137	18.4	18.4	A		0.0	12.9 - 23.9	0.5	A
Cobalt-57	14.9	15.6	A		-4.5	10.9 - 20.3	0.4	A
Cobalt-60	8.93	8.8	A		1.5	6.2 - 11.4	0.26	A
Hydrogen-3	NR	175				123 - 228		
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	20.2	20.6	A		-1.9	14.4 - 26.8	0.6	A
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	0.0047	0.0063	A			Sensitivity Evaluation	0.0014	
Plutonium-239/240	0.678	0.727	A		-6.7	0.509 - 0.945	0.014	A
Potassium-40	0.6		A			False Positive Test	0.8	
Radium-226	0.47	0.307	N		53.1	0.215 - 0.399	0.03	A

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	NR					False Positive Test		
Uranium-234	NR	1.07				0.75 - 1.39		
Uranium-238	NR	1.05				0.74 - 1.37		
Zinc-65	20.0	20.3	A		-1.5	14.2 - 26.4	0.6	A

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**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
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte
- (29) = Statistically significant negative value at 3 standard deviations



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

*Laboratory Results For MAPEP-19-MaW41*

(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	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.453	0.522	A		-13.2	0.365 - 0.679	0.024	A
Cesium-134	-0.083			A		False Positive Test	0.080	
Cesium-137	18.91	18.4	A		2.8	12.9 - 23.9	0.48	A
Cobalt-57	15.36	15.6	A		-1.5	10.9 - 20.3	0.36	A
Cobalt-60	8.86	8.8	A		0.7	6.2 - 11.4	0.18	A
Hydrogen-3	170.3	175	A		-2.7	123 - 228	3.1	N
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	21.03	20.6	A		2.1	14.4 - 26.8	0.72	A
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	0.0104	0.0063	A			Sensitivity Evaluation	0.0030	
Plutonium-239/240	0.680	0.727	A		-6.5	0.509 - 0.945	0.030	A
Potassium-40	0.70			A		False Positive Test	0.66	
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	8.94	10.6	A		-15.7	7.4 - 13.8	0.32	A
Technetium-99	NR					False Positive Test		
Uranium-234	1.029	1.07	A		-3.8	0.75 - 1.39	0.037	A
Uranium-238	0.987	1.05	A		-6.0	0.74 - 1.37	0.036	A
Zinc-65	21.35	20.3	A		5.2	14.2 - 26.4	0.67	A

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**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
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte
- (29) = Statistically significant negative value at 3 standard deviations





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

Laboratory Results For MAPEP-19-MaW41  
 (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	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.522				0.365 - 0.679		
Cesium-134	0.02		A			False Positive Test	0.04	
Cesium-137	19.6	18.4	A		6.5	12.9 - 23.9	0.4	A
Cobalt-57	16.0	15.6	A		2.6	10.9 - 20.3	0.3	N
Cobalt-60	9.0	8.8	A		2.3	6.2 - 11.4	0.2	A
Hydrogen-3	190.3	175	A		8.7	123 - 228	4.4	A
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	21.7	20.6	A		5.3	14.4 - 26.8	0.4	N
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	NR	0.0063				Sensitivity Evaluation		
Plutonium-239/240	NR	0.727				0.509 - 0.945		
Potassium-40	0.9		A			False Positive Test	0.7	
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	NR					False Positive Test		
Uranium-234	NR	1.07				0.75 - 1.39		
Uranium-238	NR	1.05				0.74 - 1.37		
Zinc-65	22.3	20.3	A		9.9	14.2 - 26.4	0.7	A

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**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

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte

(29) = Statistically significant negative value at 3 standard deviations



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

*Laboratory Results For MAPEP-19-MaW41*

(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	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.522				0.365 - 0.679		
Cesium-134	0.03		A			False Positive Test	0.04	
Cesium-137	18.02	18.4	A		-2.1	12.9 - 23.9	0.88	A
Cobalt-57	14.33	15.6	A		-8.1	10.9 - 20.3	0.73	A
Cobalt-60	8.56	8.8	A		-2.7	6.2 - 11.4	0.42	A
Hydrogen-3	169.35	175	A		-3.2	123 - 228	2.19	N
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	19.96	20.6	A		-3.1	14.4 - 26.8	0.98	A
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	NR	0.0063				Sensitivity Evaluation		
Plutonium-239/240	NR	0.727				0.509 - 0.945		
Potassium-40	5.67		N	(1)		False Positive Test	0.98	
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	NR					False Positive Test		
Uranium-234	NR	1.07				0.75 - 1.39		
Uranium-238	NR	1.05				0.74 - 1.37		
Zinc-65	19.75	20.3	A		-2.7	14.2 - 26.4	1.07	A

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**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
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte
- (29) = Statistically significant negative value at 3 standard deviations



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

## Laboratory Results For MAPEP-19-MaW41

(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	11.5				8.1 - 15.0		
Arsenic	2.526	2.53	A		-0.2	1.77 - 3.29	0.253	A
Barium	1.189	1.32	A		-9.9	0.92 - 1.72	0.119	A
Beryllium	4.969	4.55	A		9.2	3.19 - 5.92	0.497	A
Cadmium	0.412	0.433	A		-4.9	0.303 - 0.563	0.041	A
Chromium	0.158	0.00061	N	(4)		Sensitivity Evaluation	0.016	
Cobalt	14.320	14.4	A		-0.6	10.1 - 18.7	1.432	A
Copper	15.530	16.1	A		-3.5	11.3 - 20.9	1.553	A
Lead	0.544	0.547	A		-0.5	0.383 - 0.711	0.054	A
Mercury	0.1020	0.0921	A		10.7	0.0645 - 0.1197	0.01	A
Nickel	17.920	18.6	A		-3.7	13.0 - 24.2	1.792	A
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	0.084	0.085	A		-1.2	0.060 - 0.111	0.008	A
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	3.133	3.02	A		3.7	2.11 - 3.93	0.313	A
Zinc	5.350	5.38	A		-0.6	3.77 - 6.99	0.535	A

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.522				0.365 - 0.679		
Cesium-134	NR		N	(11)		False Positive Test		
Cesium-137	18.51	18.4	A		0.6	12.9 - 23.9	0.70	A
Cobalt-57	14.25	15.6	A		-8.7	10.9 - 20.3	0.38	A
Cobalt-60	8.55	8.8	A		-2.8	6.2 - 11.4	0.28	A
Hydrogen-3	162.31	175	A		-7.3	123 - 228	18.98	A
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	20.36	20.6	A		-1.2	14.4 - 26.8	0.74	A
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	NR	0.0063				Sensitivity Evaluation		
Plutonium-239/240	NR	0.727				0.509 - 0.945		
Potassium-40	NR		N	(11)		False Positive Test		
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	NR					False Positive Test		
Uranium-234	1.961	1.07	N		83.3	0.75 - 1.39	0.0811	A
Uranium-238	1.782	1.05	N		69.7	0.74 - 1.37	0.0748	A
Zinc-65	19.33	20.3	A		-4.8	14.2 - 26.4	0.93	A

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**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
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte
- (29) = Statistically significant negative value at 3 standard deviations



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

## Laboratory Results For MAPEP-19-MaW41

(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	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.509	0.522	A		-2.5	0.365 - 0.679	0.077	W
Cesium-134	-0.299		A			False Positive Test	0.113	
Cesium-137	19.6	18.4	A		6.5	12.9 - 23.9	0.68	A
Cobalt-57	15.3	15.6	A		-1.9	10.9 - 20.3	0.41	A
Cobalt-60	9.15	8.8	A		4.0	6.2 - 11.4	0.24	A
Hydrogen-3	NR	175				123 - 228		
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	20.7	20.6	A		0.5	14.4 - 26.8	0.62	A
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	NR	0.0063				Sensitivity Evaluation		
Plutonium-239/240	NR	0.727				0.509 - 0.945		
Potassium-40	7.78		N	(1)		False Positive Test	1.33	
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	NR					False Positive Test		
Uranium-234	NR	1.07				0.75 - 1.39		
Uranium-238	NR	1.05				0.74 - 1.37		
Zinc-65	20.9	20.3	A		3.0	14.2 - 26.4	0.71	A

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**Notes:**

- (1) = False Positive
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- (4) = Sensitivity Evaluation
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte
- (29) = Statistically significant negative value at 3 standard deviations





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

Laboratory Results For MAPEP-19-MaW41  
 (LANL01) Los Alamos National Laboratory  
 Mail Stop J514  
 Los Alamos, NM 87545

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.522				0.365 - 0.679		
Cesium-134	NR		N	(11)		False Positive Test		
Cesium-137	20.1	18.4	A		9.2	12.9 - 23.9	1.0	A
Cobalt-57	16.4	15.6	A		5.1	10.9 - 20.3	1.1	A
Cobalt-60	9.22	8.8	A		4.8	6.2 - 11.4	0.69	A
Hydrogen-3	NR	175				123 - 228		
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	21.6	20.6	A		4.9	14.4 - 26.8	1.3	A
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	NR	0.0063				Sensitivity Evaluation		
Plutonium-239/240	NR	0.727				0.509 - 0.945		
Potassium-40	NR		N	(11)		False Positive Test		
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	NR					False Positive Test		
Uranium-234	NR	1.07				0.75 - 1.39		
Uranium-238	NR	1.05				0.74 - 1.37		
Zinc-65	24.1	20.3	A		18.7	14.2 - 26.4	1.5	A

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**Notes:**

- (1) = False Positive
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- (11) = False Positive Test, Result Not Reported
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- (28) = Not Reporting Previously Reported Analyte
- (29) = Statistically significant negative value at 3 standard deviations



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

*Laboratory Results For MAPEP-19-MaW41*

(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	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.522				0.365 - 0.679		
Cesium-134	-0.2269		A			False Positive Test	2.269	
Cesium-137	19.61	18.4	A		6.6	12.9 - 23.9	1.126	A
Cobalt-57	15.64	15.6	A		0.3	10.9 - 20.3	.8854	A
Cobalt-60	9.071	8.8	A		3.1	6.2 - 11.4	.6004	A
Hydrogen-3	NR	175				123 - 228		
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	21.46	20.6	A		4.2	14.4 - 26.8	1.239	A
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	NR	0.0063				Sensitivity Evaluation		
Plutonium-239/240	NR	0.727				0.509 - 0.945		
Potassium-40	-3.062		A			False Positive Test	4.026	
Radium-226	NR	0.307	N	(28)		0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	NR					False Positive Test		
Uranium-234	NR	1.07				0.75 - 1.39		
Uranium-238	NR	1.05				0.74 - 1.37		
Zinc-65	20.73	20.3	A		2.1	14.2 - 26.4	1.374	A

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**Notes:**

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- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
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- (28) = Not Reporting Previously Reported Analyte
- (29) = Statistically significant negative value at 3 standard deviations



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

*Laboratory Results For MAPEP-19-MaW41*

(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	11.842	11.5	A		3.0	8.1 - 15.0	0.864	A
Arsenic	2.540	2.53	A		0.4	1.77 - 3.29	0.185	A
Barium	1.311	1.32	A		-0.7	0.92 - 1.72	0.096	A
Beryllium	4.580	4.55	A		0.7	3.19 - 5.92	0.334	A
Cadmium	0.455	0.433	A		5.1	0.303 - 0.563	0.033	A
Chromium	0.0016	0.00061	N	(4)		Sensitivity Evaluation	0.0002	
Cobalt	14.283	14.4	A		-0.8	10.1 - 18.7	1.042	A
Copper	16.736	16.1	A		4.0	11.3 - 20.9	1.221	A
Lead	0.563	0.547	A		2.9	0.383 - 0.711	0.041	A
Mercury	0.140	0.0921	N		52.0	0.0645 - 0.1197	0.010	A
Nickel	18.962	18.6	A		1.9	13.0 - 24.2	1.384	A
Selenium	0.543	0.535	A		1.5	0.375 - 0.696	0.040	A
Technetium-99	0.00023		N	(1)		False Positive Test	0.00002	
Thallium	0.00035		N	(1)		False Positive Test	0.00003	
Uranium-235	0.000667	0.000604	A		10.4	4.23E-4 - 7.85E-4	0.000047	A
Uranium-238	0.0951	0.085	A		11.9	0.060 - 0.111	0.0069	A
Uranium-Total	0.0959	0.085	A		12.8	0.060 - 0.111	0.0069	A
Vanadium	3.090	3.02	A		2.3	2.11 - 3.93	0.225	A
Zinc	5.402	5.38	A		0.4	3.77 - 6.99	0.394	A

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.522				0.365 - 0.679		
Cesium-134	-0.04		A			False Positive Test	0.06	
Cesium-137	19.00	18.4	A		3.3	12.9 - 23.9	1.40	A
Cobalt-57	15.07	15.6	A		-3.4	10.9 - 20.3	1.10	A
Cobalt-60	8.50	8.8	A		-3.4	6.2 - 11.4	0.63	A
Hydrogen-3	172.98	175	A		-1.2	123 - 228	12.97	A
Iron-55	NR	15.7	N	(28)		11.0 - 20.4		
Manganese-54	20.83	20.6	A		1.1	14.4 - 26.8	1.50	A
Nickel-63	6.67E+00	9.7	N		-31.2	6.8 - 12.6	2.64E-01	A
Plutonium-238	NR	0.0063				Sensitivity Evaluation		
Plutonium-239/240	NR	0.727				0.509 - 0.945		
Potassium-40	0.50		A			False Positive Test	0.41	
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	NR					False Positive Test		
Uranium-234	NR	1.07				0.75 - 1.39		
Uranium-238	NR	1.05				0.74 - 1.37		
Zinc-65	20.70	20.3	A		2.0	14.2 - 26.4	1.57	A

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**Notes:**

- (1) = False Positive
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- (4) = Sensitivity Evaluation
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte
- (29) = Statistically significant negative value at 3 standard deviations



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

*Laboratory Results For MAPEP-19-MaW41*

(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	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.522				0.365 - 0.679		
Cesium-134	NR					False Positive Test		
Cesium-137	NR	18.4				12.9 - 23.9		
Cobalt-57	NR	15.6				10.9 - 20.3		
Cobalt-60	NR	8.8				6.2 - 11.4		
Hydrogen-3	NR	175				123 - 228		
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	NR	20.6				14.4 - 26.8		
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	NR	0.0063				Sensitivity Evaluation		
Plutonium-239/240	NR	0.727				0.509 - 0.945		
Potassium-40	NR					False Positive Test		
Radium-226	.36	0.307	A		17.3	0.215 - 0.399	.05	A

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	NR					False Positive Test		
Uranium-234	NR	1.07				0.75 - 1.39		
Uranium-238	NR	1.05				0.74 - 1.37		
Zinc-65	NR	20.3				14.2 - 26.4		

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**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
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- (28) = Not Reporting Previously Reported Analyte
- (29) = Statistically significant negative value at 3 standard deviations





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

Laboratory Results For MAPEP-19-MaW41  
 (MART01) Fluor B&W Ports Analytical Laboratory  
 Lab COC, Bldg. X-710, Rm 222  
 Piketon, OH 45661-

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	10.6	11.5	A		-7.8	8.1 - 15.0	0.318	A
Arsenic	2.43	2.53	A		-4.0	1.77 - 3.29	0.0486	A
Barium	1.15	1.32	A		-12.9	0.92 - 1.72	0.023	A
Beryllium	4.35	4.55	A		-4.4	3.19 - 5.92	0.087	A
Cadmium	0.389	0.433	A		-10.2	0.303 - 0.563	0.121	N
Chromium	0.00586	0.00061	A			Sensitivity Evaluation	0.00182	
Cobalt	13.0	14.4	A		-9.7	10.1 - 18.7	0.39	A
Copper	14.8	16.1	A		-8.1	11.3 - 20.9	0.444	A
Lead	0.511	0.547	A		-6.6	0.383 - 0.711	0.158	N
Mercury	0.0720	0.0921	W		-21.8	0.0645 - 0.1197	0.0223	N
Nickel	16.7	18.6	A		-10.2	13.0 - 24.2	0.501	A
Selenium	0.537	0.535	A		0.4	0.375 - 0.696	0.166	N
Technetium-99	NR					False Positive Test		
Thallium	0.0195		N	(1)		False Positive Test	0.00604	
Uranium-235	0.000694	0.000604	A		14.9	4.23E-4 - 7.85E-4	0.000116	W
Uranium-238	0.0923	0.085	A		8.6	0.060 - 0.111	0.00923	A
Uranium-Total	0.0929	0.085	A		9.3	0.060 - 0.111	0.00929	A
Vanadium	2.86	3.02	A		-5.3	2.11 - 3.93	0.0572	A
Zinc	4.78	5.38	A		-11.2	3.77 - 6.99	0.0956	A

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.5595	0.522	A		7.2	0.365 - 0.679	0.04201	A
Cesium-134	-0.4297		A			False Positive Test	0.2955	
Cesium-137	19.69	18.4	A		7.0	12.9 - 23.9	1.278	A
Cobalt-57	15.46	15.6	A		-0.9	10.9 - 20.3	0.5109	A
Cobalt-60	9.479	8.8	A		7.7	6.2 - 11.4	0.6030	A
Hydrogen-3	NR	175				123 - 228		
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	22.14	20.6	A		7.5	14.4 - 26.8	1.933	A
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	0.007256	0.0063	A	(17)		Sensitivity Evaluation	0.00384	
Plutonium-239/240	0.6847	0.727	A		-5.8	0.509 - 0.945	0.0551	A
Potassium-40	6.416		A			False Positive Test	8.370	
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	0.0444		A			False Positive Test	0.390	
Uranium-234	1.135	1.07	A		6.1	0.75 - 1.39	0.08875	A
Uranium-238	1.045	1.05	A		-0.5	0.74 - 1.37	0.08375	A
Zinc-65	16.67	20.3	A		-17.9	14.2 - 26.4	2.681	W

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**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
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte
- (29) = Statistically significant negative value at 3 standard deviations



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

Laboratory Results For MAPEP-19-MaW41  
 (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	11.2	11.5	A		-2.6	8.1 - 15.0	1.12	A
Arsenic	2.45	2.53	A		-3.2	1.77 - 3.29	0.245	A
Barium	1.21	1.32	A		-8.3	0.92 - 1.72	0.121	A
Beryllium	4.30	4.55	A		-5.5	3.19 - 5.92	0.43	A
Cadmium	0.414	0.433	A		-4.4	0.303 - 0.563	0.0414	A
Chromium	0.000043	0.00061	N	(2)		Sensitivity Evaluation	0.000043	
Cobalt	13.7	14.4	A		-4.9	10.1 - 18.7	1.37	A
Copper	15.3	16.1	A		-5.0	11.3 - 20.9	1.53	A
Lead	0.539	0.547	A		-1.5	0.383 - 0.711	0.0539	A
Mercury	0.0943	0.0921	A		2.4	0.0645 - 0.1197	0.00943	A
Nickel	18.0	18.6	A		-3.2	13.0 - 24.2	1.80	A
Selenium	0.507	0.535	A		-5.2	0.375 - 0.696	0.0507	A
Technetium-99	NR					False Positive Test		
Thallium	0.0000009		A			False Positive Test	0.000000	
Uranium-235	0.000588	0.000604	A		-2.6	4.23E-4 - 7.85E-4	0.000058	A
Uranium-238	0.0818	0.085	A		-3.8	0.060 - 0.111	0.00818	A
Uranium-Total	0.0824	0.085	A		-3.1	0.060 - 0.111	0.00824	A
Vanadium	2.96	3.02	A		-2.0	2.11 - 3.93	0.296	A
Zinc	5.20	5.38	A		-3.3	3.77 - 6.99	0.520	A

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.31	0.522	N		-40.6	0.365 - 0.679	0.09	W
Cesium-134	-0.11		A			False Positive Test	0.28	
Cesium-137	18.6	18.4	A		1.1	12.9 - 23.9	0.84	A
Cobalt-57	15.1	15.6	A		-3.2	10.9 - 20.3	0.65	A
Cobalt-60	8.63	8.8	A		-1.9	6.2 - 11.4	0.36	A
Hydrogen-3	179	175	A		2.3	123 - 228	9.8	A
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	20.1	20.6	A		-2.4	14.4 - 26.8	0.88	A
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	0.027	0.0063	A	(17)		Sensitivity Evaluation	0.021	
Plutonium-239/240	0.66	0.727	A		-9.2	0.509 - 0.945	0.15	W
Potassium-40	4.68		A			False Positive Test	2.11	
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	9.71	10.6	A		-8.4	7.4 - 13.8	0.84	A
Technetium-99	NR					False Positive Test		
Uranium-234	1.87	1.07	N		74.8	0.75 - 1.39	0.24	A
Uranium-238	1.55	1.05	N		47.6	0.74 - 1.37	0.21	A
Zinc-65	20.5	20.3	A		1.0	14.2 - 26.4	1.2	A

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**Notes:**

- (1) = False Positive
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- (29) = Statistically significant negative value at 3 standard deviations



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

## Laboratory Results For MAPEP-19-MaW41

(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	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.522				0.365 - 0.679		
Cesium-134	NR		N	(11)		False Positive Test		
Cesium-137	19.749	18.4	A		7.3	12.9 - 23.9	.8545	A
Cobalt-57	16.357	15.6	A		4.9	10.9 - 20.3	0.6162	A
Cobalt-60	10.130	8.8	A		15.1	6.2 - 11.4	0.5091	A
Hydrogen-3	NR	175				123 - 228		
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	22.892	20.6	A		11.1	14.4 - 26.8	0.9226	A
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	NR	0.0063				Sensitivity Evaluation		
Plutonium-239/240	NR	0.727				0.509 - 0.945		
Potassium-40	NR		N	(11)		False Positive Test		
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	NR					False Positive Test		
Uranium-234	NR	1.07				0.75 - 1.39		
Uranium-238	NR	1.05				0.74 - 1.37		
Zinc-65	22.544	20.3	A		11.1	14.2 - 26.4	1.509	A

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**Notes:**

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- (2) = False Negative
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- (6) = Not Evaluated
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- (29) = Statistically significant negative value at 3 standard deviations



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

Laboratory Results For MAPEP-19-MaW41  
 (MSDH01) Mississippi State Dept of Health  
 Radiological Environmental Laboratory  
 Jackson, MS 39216

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	-0.696	0.522	N		-233.3	0.365 - 0.679	14.09	N
Cesium-134	2.35		N	(1)		False Positive Test	0.57	
Cesium-137	15.62	18.4	A		-15.1	12.9 - 23.9	1.96	A
Cobalt-57	15.97	15.6	A		2.4	10.9 - 20.3	1.33	A
Cobalt-60	8.04	8.8	A		-8.6	6.2 - 11.4	0.98	A
Hydrogen-3	185.2	175	A		5.8	123 - 228	5.5	A
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	21.04	20.6	A		2.1	14.4 - 26.8	1.79	A
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	NR	0.0063				Sensitivity Evaluation		
Plutonium-239/240	NR	0.727				0.509 - 0.945		
Potassium-40	-2.25			A		False Positive Test	13.78	
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	NR					False Positive Test		
Uranium-234	NR	1.07				0.75 - 1.39		
Uranium-238	NR	1.05				0.74 - 1.37		
Zinc-65	24.26	20.3	A		19.5	14.2 - 26.4	2.77	A

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**Notes:**

- (1) = False Positive
- (2) = False Negative
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- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
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- (29) = Statistically significant negative value at 3 standard deviations





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

*Laboratory Results For MAPEP-19-MaW41*

(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	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.477	0.522	A		-8.6	0.365 - 0.679	0.0350	A
Cesium-134	0.0305		A			False Positive Test	0.0465	
Cesium-137	19.2	18.4	A		4.3	12.9 - 23.9	1.05	A
Cobalt-57	15.2	15.6	A		-2.6	10.9 - 20.3	0.830	A
Cobalt-60	8.57	8.8	A		-2.6	6.2 - 11.4	0.464	A
Hydrogen-3	183	175	A		4.6	123 - 228	5.53	A
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	21.0	20.6	A		1.9	14.4 - 26.8	1.14	A
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	0.000789	0.0063	A	(17)		Sensitivity Evaluation	0.00262	
Plutonium-239/240	0.610	0.727	A		-16.1	0.509 - 0.945	0.0358	A
Potassium-40	0.292		A			False Positive Test	0.396	
Radium-226	0.380	0.307	W		23.8	0.215 - 0.399	0.0282	A

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	9.99	10.6	A		-5.8	7.4 - 13.8	0.475	A
Technetium-99	NR					False Positive Test		
Uranium-234	0.981	1.07	A		-8.3	0.75 - 1.39	0.0532	A
Uranium-238	1.00	1.05	A		-4.8	0.74 - 1.37	0.0542	A
Zinc-65	21.0	20.3	A		3.4	14.2 - 26.4	1.16	A

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**Notes:**

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

*Laboratory Results For MAPEP-19-MaW41*

(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	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.522				0.365 - 0.679		
Cesium-134	0.00885		A			False Positive Test	0.0680	
Cesium-137	17.4	18.4	A		-5.4	12.9 - 23.9	0.570	A
Cobalt-57	14.6	15.6	A		-6.4	10.9 - 20.3	0.330	A
Cobalt-60	8.87	8.8	A		0.8	6.2 - 11.4	0.280	A
Hydrogen-3	NR	175				123 - 228		
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	20.1	20.6	A		-2.4	14.4 - 26.8	0.630	A
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	NR	0.0063				Sensitivity Evaluation		
Plutonium-239/240	NR	0.727				0.509 - 0.945		
Potassium-40	0.361		A			False Positive Test	0.730	
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	NR					False Positive Test		
Uranium-234	NR	1.07				0.75 - 1.39		
Uranium-238	NR	1.05				0.74 - 1.37		
Zinc-65	19.9	20.3	A		-2.0	14.2 - 26.4	0.830	A

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**Notes:**

- (1) = False Positive
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- (4) = Sensitivity Evaluation
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
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- (28) = Not Reporting Previously Reported Analyte
- (29) = Statistically significant negative value at 3 standard deviations



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

Laboratory Results For MAPEP-19-MaW41  
 (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	11.3	11.5	A		-1.7	8.1 - 15.0	0.23	A
Arsenic	2.51	2.53	A		-0.8	1.77 - 3.29	0.08	A
Barium	1.22	1.32	A		-7.6	0.92 - 1.72	0.02	N
Beryllium	4.37	4.55	A		-4.0	3.19 - 5.92	0.18	A
Cadmium	0.420	0.433	A		-3.0	0.303 - 0.563	0.008	N
Chromium	0.003	0.00061	N	(4)		Sensitivity Evaluation	0.0003	
Cobalt	14.1	14.4	A		-2.1	10.1 - 18.7	0.27	N
Copper	16.1	16.1	A		0.0	11.3 - 20.9	0.33	A
Lead	0.525	0.547	A		-4.0	0.383 - 0.711	0.010	N
Mercury	0.088	0.0921	A		-4.5	0.0645 - 0.1197	0.001	N
Nickel	18.4	18.6	A		-1.1	13.0 - 24.2	0.36	N
Selenium	0.535	0.535	A		0.0	0.375 - 0.696	0.016	A
Technetium-99	NR					False Positive Test		
Thallium	0.006		A			False Positive Test	0.002	
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	3.00	3.02	A		-0.7	2.11 - 3.93	0.052	N
Zinc	5.24	5.38	A		-2.6	3.77 - 6.99	0.095	N

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.471	0.522	A		-9.8	0.365 - 0.679	0.025	A
Cesium-134	-0.075		A			False Positive Test	0.154	
Cesium-137	19.2	18.4	A		4.3	12.9 - 23.9	0.52	A
Cobalt-57	15.7	15.6	A		0.6	10.9 - 20.3	0.32	A
Cobalt-60	8.98	8.8	A		2.0	6.2 - 11.4	0.22	A
Hydrogen-3	1229	175	N		602.3	123 - 228	27.5	A
Iron-55	13.3	15.7	A		-15.3	11.0 - 20.4	1.02	A
Manganese-54	21.7	20.6	A		5.3	14.4 - 26.8	0.64	A
Nickel-63	10.9	9.7	A		12.4	6.8 - 12.6	1.00	A
Plutonium-238	-0.005	0.0063	A	(17)		Sensitivity Evaluation	0.007	
Plutonium-239/240	0.685	0.727	A		-5.8	0.509 - 0.945	0.030	A
Potassium-40	1.92		A			False Positive Test	1.18	
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	12.1	10.6	A		14.2	7.4 - 13.8	0.864	A
Technetium-99	0.028		A			False Positive Test	0.135	
Uranium-234	1.11	1.07	A		3.7	0.75 - 1.39	0.048	A
Uranium-238	1.06	1.05	A		1.0	0.74 - 1.37	0.046	A
Zinc-65	22.5	20.3	A		10.8	14.2 - 26.4	0.55	A

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**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
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte
- (29) = Statistically significant negative value at 3 standard deviations



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

Laboratory Results For MAPEP-19-MaW41  
 (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	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	-1.40	0.522	N		-368.2	0.365 - 0.679	0.49	N
Cesium-134	-0.52		N	(29)		False Positive Test	0.17	
Cesium-137	17.75	18.4	A		-3.5	12.9 - 23.9	0.75	A
Cobalt-57	14.80	15.6	A		-5.1	10.9 - 20.3	0.50	A
Cobalt-60	8.48	8.8	A		-3.6	6.2 - 11.4	0.44	A
Hydrogen-3	178.1	175	A		1.8	123 - 228	7.1	A
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	19.55	20.6	A		-5.1	14.4 - 26.8	0.67	A
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	NR	0.0063				Sensitivity Evaluation		
Plutonium-239/240	NR	0.727				0.509 - 0.945		
Potassium-40	2.0		A			False Positive Test	1.9	
Radium-226	13.2	0.307	N		4199.7	0.215 - 0.399	2.5	W

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	9.41	10.6	A		-11.2	7.4 - 13.8	0.35	A
Technetium-99	NR					False Positive Test		
Uranium-234	1.057	1.07	A		-1.2	0.75 - 1.39	0.092	A
Uranium-238	0.950	1.05	A		-9.5	0.74 - 1.37	0.083	A
Zinc-65	19.15	20.3	A		-5.7	14.2 - 26.4	0.81	A

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**Notes:**

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- (29) = Statistically significant negative value at 3 standard deviations





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

*Laboratory Results For MAPEP-19-MaW41*

(NRL99) Environmental Radioactivity - National Centre for Radiation Science

PO Box 29181

Christchurch, Christchurch 8540

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.463	0.522	A		-11.3	0.365 - 0.679	0.077	W
Cesium-134	NR		N	(11)		False Positive Test		
Cesium-137	18.0	18.4	A		-2.2	12.9 - 23.9	1.1	A
Cobalt-57	14.98	15.6	A		-4.0	10.9 - 20.3	0.98	A
Cobalt-60	8.22	8.8	A		-6.6	6.2 - 11.4	0.55	A
Hydrogen-3	NR	175				123 - 228		
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	19.3	20.6	A		-6.3	14.4 - 26.8	1.2	A
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	NR	0.0063				Sensitivity Evaluation		
Plutonium-239/240	NR	0.727				0.509 - 0.945		
Potassium-40	0.75		A			False Positive Test	0.26	
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	NR					False Positive Test		
Uranium-234	1.127	1.07	A		5.3	0.75 - 1.39	0.064	A
Uranium-238	0.997	1.05	A		-5.0	0.74 - 1.37	0.059	A
Zinc-65	18.9	20.3	A		-6.9	14.2 - 26.4	1.2	A

Radiological Reference Date: August 1, 2019

**Result Flags:**

A = Result acceptable Bias <=20%

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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%

RP = Relative Precision

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- (29) = Statistically significant negative value at 3 standard deviations



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

Laboratory Results For MAPEP-19-MaW41  
 (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	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.522				0.365 - 0.679		
Cesium-134	0.103		A			False Positive Test	0.125	
Cesium-137	17.8	18.4	A		-3.3	12.9 - 23.9	1.09	A
Cobalt-57	13.5	15.6	A		-13.5	10.9 - 20.3	0.946	A
Cobalt-60	8.55	8.8	A		-2.8	6.2 - 11.4	0.269	A
Hydrogen-3	154.9	175	A		-11.5	123 - 228	6.53	A
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	19.6	20.6	A		-4.9	14.4 - 26.8	1.19	A
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	NR	0.0063				Sensitivity Evaluation		
Plutonium-239/240	NR	0.727				0.509 - 0.945		
Potassium-40	0.331		A			False Positive Test	0.607	
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	NR					False Positive Test		
Uranium-234	NR	1.07				0.75 - 1.39		
Uranium-238	NR	1.05				0.74 - 1.37		
Zinc-65	19.1	20.3	A		-5.9	14.2 - 26.4	0.898	A

Radiological Reference Date: August 1, 2019

**Result Flags:**

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NR = Not Reported

**Uncertainty Flags:**

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ACCEPTABLE.....2%<=RP<=15%

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

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- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
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Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-19-MaW41

(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	11.61	11.5	A		1.0	8.1 - 15.0	0.39	A
Arsenic	2.738	2.53	A		8.2	1.77 - 3.29	0.083	A
Barium	1.233	1.32	A		-6.6	0.92 - 1.72	0.044	A
Beryllium	4.34	4.55	A		-4.6	3.19 - 5.92	0.16	A
Cadmium	0.436	0.433	A		0.7	0.303 - 0.563	0.016	A
Chromium	0.035	0.00061	A	(17)		Sensitivity Evaluation	0.035	
Cobalt	14.02	14.4	A		-2.6	10.1 - 18.7	0.55	A
Copper	16.51	16.1	A		2.5	11.3 - 20.9	0.58	A
Lead	0.571	0.547	A		4.4	0.383 - 0.711	0.017	A
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	18.26	18.6	A		-1.8	13.0 - 24.2	0.65	A
Selenium	0.535	0.535	A		0.0	0.375 - 0.696	0.020	A
Technetium-99	NR					False Positive Test		
Thallium	0.035		A			False Positive Test	0.035	
Uranium-235	0.00063	0.000604	A		4.3	4.23E-4 - 7.85E-4	0.00004	A
Uranium-238	0.089	0.085	A		4.7	0.060 - 0.111	0.006	A
Uranium-Total	0.090	0.085	A		5.9	0.060 - 0.111	0.006	A
Vanadium	3.39	3.02	A		12.3	2.11 - 3.93	0.20	A
Zinc	5.49	5.38	A		2.0	3.77 - 6.99	0.18	A

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.480	0.522	A		-8.0	0.365 - 0.679	0.037	A
Cesium-134	-0.082		A			False Positive Test	0.093	
Cesium-137	18.50	18.4	A		0.5	12.9 - 23.9	0.58	A
Cobalt-57	14.43	15.6	A		-7.5	10.9 - 20.3	0.43	A
Cobalt-60	8.65	8.8	A		-1.7	6.2 - 11.4	0.27	A
Hydrogen-3	164.6	175	A		-5.9	123 - 228	8.2	A
Iron-55	14.70	15.7	A		-6.4	11.0 - 20.4	0.94	A
Manganese-54	20.32	20.6	A		-1.4	14.4 - 26.8	0.58	A
Nickel-63	10.00	9.7	A		3.1	6.8 - 12.6	0.48	A
Plutonium-238	0.002	0.0063	A	(17)		Sensitivity Evaluation	0.002	
Plutonium-239/240	0.658	0.727	A		-9.5	0.509 - 0.945	0.046	A
Potassium-40	0.6		A			False Positive Test	1.1	
Radium-226	0.315	0.307	A		2.6	0.215 - 0.399	0.030	A

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	9.85	10.6	A		-7.1	7.4 - 13.8	0.31	A
Technetium-99	0.20		A			False Positive Test	0.35	
Uranium-234	1.092	1.07	A		2.1	0.75 - 1.39	0.069	A
Uranium-238	1.045	1.05	A		-0.5	0.74 - 1.37	0.067	A
Zinc-65	20.17	20.3	A		-0.6	14.2 - 26.4	0.62	A

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**Notes:**

- (1) = False Positive
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- (4) = Sensitivity Evaluation
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
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Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-19-MaW41

(OTLI01) Pace Analytical National Center for Testing & 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	13	11.5	A		13.0	8.1 - 15.0	0.1	N
Arsenic	2.29	2.53	A		-9.5	1.77 - 3.29	0.1	A
Barium	1.22	1.32	A		-7.6	0.92 - 1.72	0.1	A
Beryllium	4.26	4.55	A		-6.4	3.19 - 5.92	0.1	A
Cadmium	0.422	0.433	A		-2.5	0.303 - 0.563	0.1	W
Chromium	-0.018	0.00061	A	(17)		Sensitivity Evaluation	0.1	
Cobalt	13.1	14.4	A		-9.0	10.1 - 18.7	0.1	N
Copper	15.1	16.1	A		-6.2	11.3 - 20.9	0.1	N
Lead	0.53	0.547	A		-3.1	0.383 - 0.711	0.1	W
Mercury	0.0581	0.0921	N		-36.9	0.0645 - 0.1197	0.001	N
Nickel	17.1	18.6	A		-8.1	13.0 - 24.2	0.1	N
Selenium	0.542	0.535	A		1.3	0.375 - 0.696	0.1	W
Technetium-99	NR					False Positive Test		
Thallium	-0.018		A			False Positive Test	0.1	
Uranium-235	0.00074	0.000604	W		22.5	4.23E-4 - 7.85E-4	0.00005	A
Uranium-238	0.105	0.085	W		23.5	0.060 - 0.111	.005	A
Uranium-Total	0.087	0.085	A		2.4	0.060 - 0.111	.05	N
Vanadium	2.74	3.02	A		-9.3	2.11 - 3.93	0.1	A
Zinc	4.94	5.38	A		-8.2	3.77 - 6.99	0.1	A

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.470	0.522	A		-10.0	0.365 - 0.679	0.061	A
Cesium-134	.02		A			False Positive Test	0.2	
Cesium-137	18.7	18.4	A		1.6	12.9 - 23.9	2.99	W
Cobalt-57	19.2	15.6	W		23.1	10.9 - 20.3	3.39	W
Cobalt-60	8.99	8.8	A		2.2	6.2 - 11.4	1.22	A
Hydrogen-3	816	175	N		366.3	123 - 228	22.1	A
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	21.0	20.6	A		1.9	14.4 - 26.8	3.19	W
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	0.019	0.0063	A	(17)		Sensitivity Evaluation	0.009	
Plutonium-239/240	0.552	0.727	W		-24.1	0.509 - 0.945	0.036	A
Potassium-40	NR		N	(11)		False Positive Test		
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	9.65	10.6	A		-9.0	7.4 - 13.8	0.199	A
Technetium-99	0.66		A			False Positive Test	0.35	
Uranium-234	0.96	1.07	A		-10.3	0.75 - 1.39	0.133	A
Uranium-238	1.09	1.05	A		3.8	0.74 - 1.37	0.14	A
Zinc-65	20.8	20.3	A		2.5	14.2 - 26.4	3.08	A

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**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
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte
- (29) = Statistically significant negative value at 3 standard deviations





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

Laboratory Results For MAPEP-19-MaW41

(QUAN02) 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	13.2	11.5	A		14.8	8.1 - 15.0	0.440000	A
Arsenic	2.61	2.53	A		3.2	1.77 - 3.29	0.09135	A
Barium	1.29	1.32	A		-2.3	0.92 - 1.72	0.04300	A
Beryllium	4.66	4.55	A		2.4	3.19 - 5.92	0.15533	A
Cadmium	0.464	0.433	A		7.2	0.303 - 0.563	0.01547	A
Chromium	0.00048	0.00061	A	(17)		Sensitivity Evaluation	0.00016	
Cobalt	15.1	14.4	A		4.9	10.1 - 18.7	0.50333	A
Copper	16.6	16.1	A		3.1	11.3 - 20.9	0.55333	A
Lead	0.584	0.547	A		6.8	0.383 - 0.711	0.019500	A
Mercury	0.08760	0.0921	A		-4.9	0.0645 - 0.1197	0.00292	A
Nickel	19.8	18.6	A		6.5	13.0 - 24.2	0.66000	A
Selenium	0.568	0.535	A		6.2	0.375 - 0.696	0.01893	A
Technetium-99	NR					False Positive Test		
Thallium	-0.05822		A			False Positive Test	0.020	
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	3.21	3.02	A		6.3	2.11 - 3.93	0.10700	A
Zinc	5.56	5.38	A		3.3	3.77 - 6.99	0.24093	A

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.522				0.365 - 0.679		
Cesium-134	NR					False Positive Test		
Cesium-137	NR	18.4				12.9 - 23.9		
Cobalt-57	NR	15.6				10.9 - 20.3		
Cobalt-60	NR	8.8				6.2 - 11.4		
Hydrogen-3	NR	175				123 - 228		
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	NR	20.6				14.4 - 26.8		
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	NR	0.0063				Sensitivity Evaluation		
Plutonium-239/240	NR	0.727				0.509 - 0.945		
Potassium-40	NR					False Positive Test		
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	NR					False Positive Test		
Uranium-234	NR	1.07				0.75 - 1.39		
Uranium-238	NR	1.05				0.74 - 1.37		
Zinc-65	NR	20.3				14.2 - 26.4		

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**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
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte
- (29) = Statistically significant negative value at 3 standard deviations



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

*Laboratory Results For MAPEP-19-MaW41*

(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	12.009	11.5	A		4.4	8.1 - 15.0	0.027	N
Arsenic	2.516	2.53	A		-0.6	1.77 - 3.29	0.053	A
Barium	1.315	1.32	A		-0.4	0.92 - 1.72	1.837	N
Beryllium	4.811	4.55	A		5.7	3.19 - 5.92	6.877	N
Cadmium	0.469	0.433	A		8.3	0.303 - 0.563	0.659	N
Chromium	0.001	0.00061	N	(4)		Sensitivity Evaluation	0.00004	
Cobalt	14.856	14.4	A		3.2	10.1 - 18.7	0.280	N
Copper	16.464	16.1	A		2.3	11.3 - 20.9	0.131	N
Lead	0.592	0.547	A		8.2	0.383 - 0.711	0.850	N
Mercury	0.088	0.0921	A		-4.5	0.0645 - 0.1197	0.001	N
Nickel	19.119	18.6	A		2.8	13.0 - 24.2	0.204	N
Selenium	0.573	0.535	A		7.1	0.375 - 0.696	0.054	A
Technetium-99	NR					False Positive Test		
Thallium	0.00013		N	(1)		False Positive Test	0.00002	
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	0.088	0.085	A		3.5	0.060 - 0.111	0.123	N
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	3.139	3.02	A		3.9	2.11 - 3.93	0.018	N
Zinc	5.595	5.38	A		4.0	3.77 - 6.99	8.254	N

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.522				0.365 - 0.679		
Cesium-134	NR					False Positive Test		
Cesium-137	NR	18.4				12.9 - 23.9		
Cobalt-57	NR	15.6				10.9 - 20.3		
Cobalt-60	NR	8.8				6.2 - 11.4		
Hydrogen-3	NR	175				123 - 228		
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	NR	20.6				14.4 - 26.8		
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	NR	0.0063				Sensitivity Evaluation		
Plutonium-239/240	NR	0.727				0.509 - 0.945		
Potassium-40	NR					False Positive Test		
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	NR					False Positive Test		
Uranium-234	NR	1.07				0.75 - 1.39		
Uranium-238	NR	1.05				0.74 - 1.37		
Zinc-65	NR	20.3				14.2 - 26.4		

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**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
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte
- (29) = Statistically significant negative value at 3 standard deviations



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

*Laboratory Results For MAPEP-19-MaW41*

(RPSC01) Radiation Protection Service

Ontario Ministry of Labour

Weston, Ontario M9P 3T1

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.522				0.365 - 0.679		
Cesium-134	NR		N	(11)		False Positive Test		
Cesium-137	18.4	18.4	A		0.0	12.9 - 23.9	2.32	A
Cobalt-57	15.2	15.6	A		-2.6	10.9 - 20.3	3.08	W
Cobalt-60	8.77	8.8	A		-0.3	6.2 - 11.4	0.92	A
Hydrogen-3	186.18	175	A		6.4	123 - 228	27.4	A
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	20	20.6	A		-2.9	14.4 - 26.8	2.53	A
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	NR	0.0063				Sensitivity Evaluation		
Plutonium-239/240	NR	0.727				0.509 - 0.945		
Potassium-40	NR		N	(11)		False Positive Test		
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	NR					False Positive Test		
Uranium-234	NR	1.07				0.75 - 1.39		
Uranium-238	NR	1.05				0.74 - 1.37		
Zinc-65	19.10	20.3	A		-5.9	14.2 - 26.4	2.17	A

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**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
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte
- (29) = Statistically significant negative value at 3 standard deviations



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

## Laboratory Results For MAPEP-19-MaW41

(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	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	0.0853	0.085	A		0.4	0.060 - 0.111	0.0043	A
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.210	0.522	N		-59.8	0.365 - 0.679	0.021	A
Cesium-134	0.55		A			False Positive Test	0.55	
Cesium-137	17.7	18.4	A		-3.8	12.9 - 23.9	0.8	A
Cobalt-57	14.9	15.6	A		-4.5	10.9 - 20.3	0.6	A
Cobalt-60	7.75	8.8	A		-11.9	6.2 - 11.4	0.51	A
Hydrogen-3	518	175	N		196.0	123 - 228	23	A
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	18.9	20.6	A		-8.3	14.4 - 26.8	0.7	A
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	0.0974	0.0063	N	(4)		Sensitivity Evaluation	0.0128	
Plutonium-239/240	0.704	0.727	A		-3.2	0.509 - 0.945	0.035	A
Potassium-40	NR		N	(11)		False Positive Test		
Radium-226	0.244	0.307	W		-20.5	0.215 - 0.399	0.028	A

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	9.31	10.6	A		-12.2	7.4 - 13.8	1.75	W
Technetium-99	NR					False Positive Test		
Uranium-234	1.18	1.07	A		10.3	0.75 - 1.39	0.08	A
Uranium-238	1.18	1.05	A		12.4	0.74 - 1.37	0.08	A
Zinc-65	17.9	20.3	A		-11.8	14.2 - 26.4	1.2	A

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**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
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte
- (29) = Statistically significant negative value at 3 standard deviations





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

*Laboratory Results For MAPEP-19-MaW41*

(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	11.4	11.5	A		-0.9	8.1 - 15.0	1.1	A
Arsenic	2.62	2.53	A		3.6	1.77 - 3.29	0.26	A
Barium	1.27	1.32	A		-3.8	0.92 - 1.72	0.13	A
Beryllium	4.62	4.55	A		1.5	3.19 - 5.92	0.46	A
Cadmium	0.447	0.433	A		3.2	0.303 - 0.563	0.045	A
Chromium	0.0285	0.00061	A	(17)		Sensitivity Evaluation	0.010	
Cobalt	14.6	14.4	A		1.4	10.1 - 18.7	1.5	A
Copper	15.7	16.1	A		-2.5	11.3 - 20.9	1.6	A
Lead	0.528	0.547	A		-3.5	0.383 - 0.711	0.053	A
Mercury	0.0792	0.0921	A		-14.0	0.0645 - 0.1197	0.0080	A
Nickel	19.1	18.6	A		2.7	13.0 - 24.2	1.9	A
Selenium	0.545	0.535	A		1.9	0.375 - 0.696	0.055	A
Technetium-99	NR					False Positive Test		
Thallium	0.000192		A			False Positive Test	0.000070	
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	0.0840	0.085	A		-1.2	0.060 - 0.111	0.0084	A
Vanadium	3.09	3.02	A		2.3	2.11 - 3.93	0.31	A
Zinc	5.63	5.38	A		4.6	3.77 - 6.99	0.56	A

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.522				0.365 - 0.679		
Cesium-134	3.42		A			False Positive Test	3.24	
Cesium-137	17.7	18.4	A		-3.8	12.9 - 23.9	1.46	A
Cobalt-57	14.5	15.6	A		-7.1	10.9 - 20.3	0.544	A
Cobalt-60	8.86	8.8	A		0.7	6.2 - 11.4	0.469	A
Hydrogen-3	NR	175				123 - 228		
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	19.5	20.6	A		-5.3	14.4 - 26.8	0.843	A
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	NR	0.0063				Sensitivity Evaluation		
Plutonium-239/240	NR	0.727				0.509 - 0.945		
Potassium-40	6.72		A			False Positive Test	7.46	
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	NR					False Positive Test		
Uranium-234	NR	1.07				0.75 - 1.39		
Uranium-238	NR	1.05				0.74 - 1.37		
Zinc-65	21.5	20.3	A		5.9	14.2 - 26.4	1.35	A

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**Notes:**

- (1) = False Positive
- (2) = False Negative
- (4) = Sensitivity Evaluation
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
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- (28) = Not Reporting Previously Reported Analyte
- (29) = Statistically significant negative value at 3 standard deviations



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

Laboratory Results For MAPEP-19-MaW41  
 (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	11.6	11.5	A		0.9	8.1 - 15.0	1.4	A
Arsenic	2.44	2.53	A		-3.6	1.77 - 3.29	0.24	A
Barium	1.27	1.32	A		-3.8	0.92 - 1.72	0.12	A
Beryllium	4.48	4.55	A		-1.5	3.19 - 5.92	0.36	A
Cadmium	0.433	0.433	A		0.0	0.303 - 0.563	0.048	A
Chromium	0.005	0.00061	A	(17)		Sensitivity Evaluation	0.005	
Cobalt	13.7	14.4	A		-4.9	10.1 - 18.7	1.2	A
Copper	16.2	16.1	A		0.6	11.3 - 20.9	1.6	A
Lead	0.575	0.547	A		5.1	0.383 - 0.711	0.058	A
Mercury	0.1	0.0921	A		8.6	0.0645 - 0.1197	0.01	A
Nickel	18.5	18.6	A		-0.5	13.0 - 24.2	1.9	A
Selenium	0.428	0.535	A		-20.0	0.375 - 0.696	0.051	A
Technetium-99	NR					False Positive Test		
Thallium	0.043		A			False Positive Test	0.043	
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	3.04	3.02	A		0.7	2.11 - 3.93	0.30	A
Zinc	5.00	5.38	A		-7.1	3.77 - 6.99	0.50	A

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.500	0.522	A		-4.2	0.365 - 0.679	0.037	A
Cesium-134	0.06		A			False Positive Test	0.13	
Cesium-137	19.4	18.4	A		5.4	12.9 - 23.9	1.4	A
Cobalt-57	15.55	15.6	A		-0.3	10.9 - 20.3	0.94	A
Cobalt-60	8.91	8.8	A		1.3	6.2 - 11.4	0.54	A
Hydrogen-3	141	175	A		-19.4	123 - 228	19	A
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	21.1	20.6	A		2.4	14.4 - 26.8	1.4	A
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	0.0071	0.0063	A	(17)		Sensitivity Evaluation	0.0027	
Plutonium-239/240	0.64	0.727	A		-12.0	0.509 - 0.945	0.049	A
Potassium-40	-0.04		A			False Positive Test	1.1	
Radium-226	0.375	0.307	W		22.2	0.215 - 0.399	0.018	A

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	9.56	10.6	A		-9.8	7.4 - 13.8	0.72	A
Technetium-99	0.86		A			False Positive Test	0.49	
Uranium-234	1.032	1.07	A		-3.6	0.75 - 1.39	0.072	A
Uranium-238	1.029	1.05	A		-2.0	0.74 - 1.37	0.069	A
Zinc-65	21.4	20.3	A		5.4	14.2 - 26.4	1.5	A

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**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
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte
- (29) = Statistically significant negative value at 3 standard deviations



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

Laboratory Results For MAPEP-19-MaW41  
 (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	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.522				0.365 - 0.679		
Cesium-134	0.3		A			False Positive Test	0.3	
Cesium-137	18.4	18.4	A		0.0	12.9 - 23.9	1.8	A
Cobalt-57	14.5	15.6	A		-7.1	10.9 - 20.3	1.4	A
Cobalt-60	9.1	8.8	A		3.4	6.2 - 11.4	0.9	A
Hydrogen-3	173	175	A		-1.1	123 - 228	17	A
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	20.2	20.6	A		-1.9	14.4 - 26.8	2.0	A
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	NR	0.0063				Sensitivity Evaluation		
Plutonium-239/240	NR	0.727				0.509 - 0.945		
Potassium-40	5		A			False Positive Test	5	
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	NR					False Positive Test		
Uranium-234	NR	1.07				0.75 - 1.39		
Uranium-238	NR	1.05				0.74 - 1.37		
Zinc-65	21.2	20.3	A		4.4	14.2 - 26.4	2.1	A

Radiological Reference Date: August 1, 2019

**Result 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%

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

*Laboratory Results For MAPEP-19-MaW41*

(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	11.8	11.5	A		2.6	8.1 - 15.0	0.719	A
Arsenic	2.60	2.53	A		2.8	1.77 - 3.29	0.200	A
Barium	1.31	1.32	A		-0.8	0.92 - 1.72	0.0825	A
Beryllium	5.03	4.55	A		10.5	3.19 - 5.92	0.303	A
Cadmium	0.445	0.433	A		2.8	0.303 - 0.563	0.0366	A
Chromium	0.000470	0.00061	A	(17)		Sensitivity Evaluation	0.00250	
Cobalt	14.3	14.4	A		-0.7	10.1 - 18.7	0.858	A
Copper	16.3	16.1	A		1.2	11.3 - 20.9	0.978	A
Lead	0.530	0.547	A		-3.1	0.383 - 0.711	0.0492	A
Mercury	0.0888	0.0921	A		-3.6	0.0645 - 0.1197	0.00542	A
Nickel	18.4	18.6	A		-1.1	13.0 - 24.2	1.10	A
Selenium	0.494	0.535	A		-7.7	0.375 - 0.696	0.0297	A
Technetium-99	-0.000000		A			False Positive Test	0.000000	
Thallium	0.000608		A			False Positive Test	0.00250	
Uranium-235	0.000567	0.000604	A		-6.1	4.23E-4 - 7.85E-4	0.000042	A
Uranium-238	0.0843	0.085	A		-0.8	0.060 - 0.111	0.00506	A
Uranium-Total	0.0850	0.085	A		0.0	0.060 - 0.111	0.00510	A
Vanadium	3.07	3.02	A		1.7	2.11 - 3.93	0.186	A
Zinc	5.53	5.38	A		2.8	3.77 - 6.99	0.333	A

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.559	0.522	A		7.1	0.365 - 0.679	0.0504	A
Cesium-134	-0.111		A			False Positive Test	0.101	
Cesium-137	18.7	18.4	A		1.6	12.9 - 23.9	0.667	A
Cobalt-57	15.5	15.6	A		-0.6	10.9 - 20.3	0.389	A
Cobalt-60	8.78	8.8	A		-0.2	6.2 - 11.4	0.213	A
Hydrogen-3	177	175	A		1.1	123 - 228	11.6	A
Iron-55	14.7	15.7	A		-6.4	11.0 - 20.4	1.41	A
Manganese-54	20.9	20.6	A		1.5	14.4 - 26.8	0.796	A
Nickel-63	9.15	9.7	A		-5.7	6.8 - 12.6	0.578	A
Plutonium-238	0.00715	0.0063	A	(17)		Sensitivity Evaluation	0.00370	
Plutonium-239/240	0.704	0.727	A		-3.2	0.509 - 0.945	0.0515	A
Potassium-40	2.24		N	(1)		False Positive Test	0.515	
Radium-226	0.217	0.307	W		-29.3	0.215 - 0.399	0.0273	A

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	11.4	10.6	A		7.5	7.4 - 13.8	0.719	A
Technetium-99	0.0229		A			False Positive Test	0.197	
Uranium-234	1.13	1.07	A		5.6	0.75 - 1.39	0.0811	A
Uranium-238	1.13	1.05	A		7.6	0.74 - 1.37	0.0807	A
Zinc-65	21.1	20.3	A		3.9	14.2 - 26.4	0.756	A

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**Notes:**

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

*Laboratory Results For MAPEP-19-MaW41*

(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	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.522				0.365 - 0.679		
Cesium-134	-0.434		A			False Positive Test	0.167	
Cesium-137	18.4	18.4	A		0.0	12.9 - 23.9	0.550	A
Cobalt-57	15.0	15.6	A		-3.8	10.9 - 20.3	0.424	A
Cobalt-60	8.32	8.8	A		-5.5	6.2 - 11.4	0.310	A
Hydrogen-3	176	175	A		0.6	123 - 228	16.4	A
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	19.9	20.6	A		-3.4	14.4 - 26.8	0.552	A
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	NR	0.0063				Sensitivity Evaluation		
Plutonium-239/240	NR	0.727				0.509 - 0.945		
Potassium-40	2.52		A			False Positive Test	0.952	
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	NR					False Positive Test		
Uranium-234	NR	1.07				0.75 - 1.39		
Uranium-238	NR	1.05				0.74 - 1.37		
Zinc-65	18.3	20.3	A		-9.9	14.2 - 26.4	0.668	A

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**Notes:**

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

## Laboratory Results For MAPEP-19-MaW41

(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	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.41	0.522	W		-21.5	0.365 - 0.679	0.10	W
Cesium-134	-0.08		A			False Positive Test	0.23	
Cesium-137	18.75	18.4	A		1.9	12.9 - 23.9	0.54	A
Cobalt-57	15.35	15.6	A		-1.6	10.9 - 20.3	0.33	A
Cobalt-60	8.92	8.8	A		1.4	6.2 - 11.4	0.19	A
Hydrogen-3	181	175	A		3.4	123 - 228	11	A
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	21.01	20.6	A		2.0	14.4 - 26.8	0.53	A
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	0.0135	0.0063	A	(17)		Sensitivity Evaluation	0.0066	
Plutonium-239/240	0.586	0.727	A		-19.4	0.509 - 0.945	0.059	A
Potassium-40	-1.59		A			False Positive Test	0.54	
Radium-226	0.305	0.307	A		-0.7	0.215 - 0.399	0.015	A

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	8.73	10.6	A		-17.6	7.4 - 13.8	0.18	A
Technetium-99	NR					False Positive Test		
Uranium-234	1.005	1.07	A		-6.1	0.75 - 1.39	0.083	A
Uranium-238	0.947	1.05	A		-9.8	0.74 - 1.37	0.084	A
Zinc-65	21.49	20.3	A		5.9	14.2 - 26.4	0.60	A

Radiological Reference Date: August 1, 2019

**Result 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:**

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**Notes:**

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

*Laboratory Results For MAPEP-19-MaW41*

(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	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.522	N	(28)		0.365 - 0.679		
Cesium-134	NR					False Positive Test		
Cesium-137	NR	18.4				12.9 - 23.9		
Cobalt-57	NR	15.6				10.9 - 20.3		
Cobalt-60	NR	8.8				6.2 - 11.4		
Hydrogen-3	NR	175				123 - 228		
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	NR	20.6				14.4 - 26.8		
Nickel-63	7.28	9.7	W		-24.9	6.8 - 12.6	.439	A
Plutonium-238	.0207	0.0063	A	(17)		Sensitivity Evaluation	.0278	
Plutonium-239/240	.741	0.727	A		1.9	0.509 - 0.945	.213	W
Potassium-40	NR					False Positive Test		
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	NR					False Positive Test		
Uranium-234	NR	1.07				0.75 - 1.39		
Uranium-238	NR	1.05				0.74 - 1.37		
Zinc-65	NR	20.3				14.2 - 26.4		

Radiological Reference Date: August 1, 2019

**Result Flags:**

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**Uncertainty Flags:**

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- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte
- (29) = Statistically significant negative value at 3 standard deviations



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

Laboratory Results For MAPEP-19-MaW41  
 (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	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.522				0.365 - 0.679		
Cesium-134	-0.08		A			False Positive Test	0.06	
Cesium-137	18.48	18.4	A		0.4	12.9 - 23.9	0.90	A
Cobalt-57	14.68	15.6	A		-5.9	10.9 - 20.3	0.52	A
Cobalt-60	8.67	8.8	A		-1.5	6.2 - 11.4	0.39	A
Hydrogen-3	179.52	175	A		2.6	123 - 228	3.32	N
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	20.72	20.6	A		0.6	14.4 - 26.8	0.93	A
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	NR	0.0063				Sensitivity Evaluation		
Plutonium-239/240	NR	0.727				0.509 - 0.945		
Potassium-40	5.11		N	(1)		False Positive Test	0.68	
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	NR					False Positive Test		
Uranium-234	1.11	1.07	A		3.7	0.75 - 1.39	0.04	A
Uranium-238	1.08	1.05	A		2.9	0.74 - 1.37	0.04	A
Zinc-65	20.52	20.3	A		1.1	14.2 - 26.4	1.05	A

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**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
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte
- (29) = Statistically significant negative value at 3 standard deviations





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

Laboratory Results For MAPEP-19-MaW41  
 (TMAO01) EBERLINE SERVICES OAK RIDGE LABORATORY  
 601 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	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	.6106	0.522	A		17.0	0.365 - 0.679	.1233	W
Cesium-134	-.188		A			False Positive Test	.664	
Cesium-137	19.91	18.4	A		8.2	12.9 - 23.9	2.27	A
Cobalt-57	16.96	15.6	A		8.7	10.9 - 20.3	2.24	A
Cobalt-60	9.115	8.8	A		3.6	6.2 - 11.4	.933	A
Hydrogen-3	170.37	175	A		-2.6	123 - 228	12.17	A
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	22.396	20.6	A		8.7	14.4 - 26.8	2.66	A
Nickel-63	10.44	9.7	A		7.6	6.8 - 12.6	.617	A
Plutonium-238	0.0002	0.0063	A	(17)		Sensitivity Evaluation	.0218	
Plutonium-239/240	.7501	0.727	A		3.2	0.509 - 0.945	.144	W
Potassium-40	4.22		A			False Positive Test	4.739	
Radium-226	.3876	0.307	W		26.3	0.215 - 0.399	.131	N

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	11.56	10.6	A		9.1	7.4 - 13.8	.336	A
Technetium-99	1.257		N	(1)		False Positive Test	.177	
Uranium-234	1.11	1.07	A		3.7	0.75 - 1.39	.150	A
Uranium-238	1.11	1.05	A		5.7	0.74 - 1.37	.1503	A
Zinc-65	18.35	20.3	A		-9.6	14.2 - 26.4	3.28	W

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**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
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte
- (29) = Statistically significant negative value at 3 standard deviations



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

Laboratory Results For MAPEP-19-MaW41  
 (TNUT01) St. Louis USACE FUSRAP Laboratory  
 8945 LATTY AVE  
 BERKELEY, MO 63134-1024

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	.440	0.522	A		-15.7	0.365 - 0.679	.073	W
Cesium-134	.076		A			False Positive Test	.203	
Cesium-137	19.281	18.4	A		4.8	12.9 - 23.9	.590	A
Cobalt-57	15.622	15.6	A		0.1	10.9 - 20.3	0.336	A
Cobalt-60	8.873	8.8	A		0.8	6.2 - 11.4	0.199	A
Hydrogen-3	NR	175				123 - 228		
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	21.514	20.6	A		4.4	14.4 - 26.8	0.576	A
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	NR	0.0063				Sensitivity Evaluation		
Plutonium-239/240	NR	0.727				0.509 - 0.945		
Potassium-40	4.528		A			False Positive Test	1.99	
Radium-226	.308	0.307	A		0.3	0.215 - 0.399	.031	A

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	NR					False Positive Test		
Uranium-234	1.105	1.07	A		3.3	0.75 - 1.39	.086	A
Uranium-238	1.071	1.05	A		2.0	0.74 - 1.37	0.084	A
Zinc-65	22.130	20.3	A		9.0	14.2 - 26.4	0.704	A

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**Notes:**

- (1) = False Positive
- (2) = False Negative
- (4) = Sensitivity Evaluation
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
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- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte
- (29) = Statistically significant negative value at 3 standard deviations



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

*Laboratory Results For MAPEP-19-MaW41*

(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	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.522				0.365 - 0.679		
Cesium-134	0.2		A			False Positive Test	0.6	
Cesium-137	20.5	18.4	A		11.4	12.9 - 23.9	2.0	A
Cobalt-57	16.1	15.6	A		3.2	10.9 - 20.3	1.4	A
Cobalt-60	8.9	8.8	A		1.1	6.2 - 11.4	1.0	A
Hydrogen-3	NR	175				123 - 228		
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	21.0	20.6	A		1.9	14.4 - 26.8	2	A
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	NR	0.0063				Sensitivity Evaluation		
Plutonium-239/240	NR	0.727				0.509 - 0.945		
Potassium-40	0.1		A			False Positive Test	0.5	
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	NR					False Positive Test		
Uranium-234	NR	1.07				0.75 - 1.39		
Uranium-238	NR	1.05				0.74 - 1.37		
Zinc-65	20.9	20.3	A		3.0	14.2 - 26.4	3.1	A

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**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
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte
- (29) = Statistically significant negative value at 3 standard deviations



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

Laboratory Results For MAPEP-19-MaW41  
 (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	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.4662	0.522	A		-10.7	0.365 - 0.679	0.0818	W
Cesium-134	0.00001		A			False Positive Test	0.1529	
Cesium-137	19.529	18.4	A		6.1	12.9 - 23.9	2.1471	A
Cobalt-57	13.799	15.6	A		-11.5	10.9 - 20.3	1.9364	A
Cobalt-60	9.0633	8.8	A		3.0	6.2 - 11.4	1.0101	A
Hydrogen-3	420.5087	175	N		140.3	123 - 228	56.7543	A
Iron-55	13.8223	15.7	A		-12.0	11.0 - 20.4	2.2959	W
Manganese-54	20.966	20.6	A		1.8	14.4 - 26.8	2.3015	A
Nickel-63	NR	9.7	N	(28)		6.8 - 12.6		
Plutonium-238	0.0455	0.0063	A			Sensitivity Evaluation	0.0144	
Plutonium-239/240	0.6993	0.727	A		-3.8	0.509 - 0.945	0.1103	W
Potassium-40	0.00001		A			False Positive Test	1.1745	
Radium-226	0.3243	0.307	A		5.6	0.215 - 0.399	0.071	W

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	8.6432	10.6	A		-18.5	7.4 - 13.8	1.3801	W
Technetium-99	-0.1743		A			False Positive Test	0.4107	
Uranium-234	0.9694	1.07	A		-9.4	0.75 - 1.39	0.1443	A
Uranium-238	0.9731	1.05	A		-7.3	0.74 - 1.37	0.145	A
Zinc-65	18.929	20.3	A		-6.8	14.2 - 26.4	2.1805	A

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**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
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte
- (29) = Statistically significant negative value at 3 standard deviations





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

Laboratory Results For MAPEP-19-MaW41  
 (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	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	.289	0.522	N		-44.6	0.365 - 0.679	.510	N
Cesium-134	.075		A			False Positive Test	.067	
Cesium-137	19.918	18.4	A		8.3	12.9 - 23.9	.572	A
Cobalt-57	16.587	15.6	A		6.3	10.9 - 20.3	.516	A
Cobalt-60	9.210	8.8	A		4.7	6.2 - 11.4	.262	A
Hydrogen-3	NR	175				123 - 228		
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	22.215	20.6	A		7.8	14.4 - 26.8	.595	A
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	NR	0.0063				Sensitivity Evaluation		
Plutonium-239/240	NR	0.727				0.509 - 0.945		
Potassium-40	0.264		A			False Positive Test	.906	
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	NR					False Positive Test		
Uranium-234	NR	1.07				0.75 - 1.39		
Uranium-238	NR	1.05				0.74 - 1.37		
Zinc-65	22.147	20.3	A		9.1	14.2 - 26.4	.805	A

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**Notes:**

- (1) = False Positive
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- (4) = Sensitivity Evaluation
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte
- (29) = Statistically significant negative value at 3 standard deviations



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

*Laboratory Results For MAPEP-19-MaW41*

(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	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	.484	0.522	A		-7.3	0.365 - 0.679	.0307	A
Cesium-134	-.0256			A		False Positive Test	.0572	
Cesium-137	17.4	18.4	A		-5.4	12.9 - 23.9	.663	A
Cobalt-57	14.4	15.6	A		-7.7	10.9 - 20.3	.437	A
Cobalt-60	8.11	8.8	A		-7.8	6.2 - 11.4	.289	A
Hydrogen-3	NR	175				123 - 228		
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	19	20.6	A		-7.8	14.4 - 26.8	.508	A
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	.0123	0.0063	A	(17)		Sensitivity Evaluation	.00677	
Plutonium-239/240	.743	0.727	A		2.2	0.509 - 0.945	.0476	A
Potassium-40	.759			A		False Positive Test	.927	
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	11.3	10.6	A		6.6	7.4 - 13.8	.692	A
Technetium-99	NR					False Positive Test		
Uranium-234	0.811	1.07	W		-24.2	0.75 - 1.39	.0622	A
Uranium-238	.797	1.05	W		-24.1	0.74 - 1.37	.0620	A
Zinc-65	18.6	20.3	A		-8.4	14.2 - 26.4	.550	A

Radiological Reference Date: August 1, 2019

**Result 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%

RP = Relative Precision

**Notes:**

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- (17) = NOT DETECTED - reported a statistically zero result
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte
- (29) = Statistically significant negative value at 3 standard deviations



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

Laboratory Results For MAPEP-19-MaW41  
 (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	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.4710	0.522	A		-9.8	0.365 - 0.679	0.03546	A
Cesium-134	-0.215			A		False Positive Test	0.192	
Cesium-137	19.3	18.4	A		4.9	12.9 - 23.9	0.578	A
Cobalt-57	16.1	15.6	A		3.2	10.9 - 20.3	0.399	A
Cobalt-60	9.13	8.8	A		3.8	6.2 - 11.4	0.518	A
Hydrogen-3	177.60	175	A		1.5	123 - 228	3.945	A
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	21.3	20.6	A		3.4	14.4 - 26.8	0.923	A
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	0.005344	0.0063	A	(17)		Sensitivity Evaluation	0.008812	
Plutonium-239/240	0.6283	0.727	A		-13.6	0.509 - 0.945	0.03996	A
Potassium-40	-0.00773			A		False Positive Test	0.621	
Radium-226	0.3008	0.307	A		-2.0	0.215 - 0.399	0.0204	A

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6	N	(28)		7.4 - 13.8		
Technetium-99	NR					False Positive Test		
Uranium-234	1.111	1.07	A		3.8	0.75 - 1.39	0.06536	A
Uranium-238	1.137	1.05	A		8.3	0.74 - 1.37	0.06284	A
Zinc-65	21.0	20.3	A		3.4	14.2 - 26.4	1.58	A

Radiological Reference Date: August 1, 2019

**Result Flags:**

A = Result acceptable Bias <=20%

W = Result acceptable with warning 20% < Bias < 30%

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RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

ACCEPTABLE.....2%<=RP<=15%

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

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RP = Relative Precision

**Notes:**

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- (4) = Sensitivity Evaluation
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- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
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- (29) = Statistically significant negative value at 3 standard deviations



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

*Laboratory Results For MAPEP-19-MaW41*

(WSTP99) Cavendish Nuclear Limited

Greson Court

Cumbria, UK CA24 3HZ

Inorganic							Units: (mg/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	0.000203		N	(1)		False Positive Test	0.000009	
Thallium	NR					False Positive Test		
Uranium-235	0.00067	0.000604	A		10.9	4.23E-4 - 7.85E-4	0.00005	A
Uranium-238	0.082	0.085	A		-3.5	0.060 - 0.111	0.005	A
Uranium-Total	0.085	0.085	A		0.0	0.060 - 0.111	0.003	A
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.52	0.522	A		-0.4	0.365 - 0.679	0.05	A
Cesium-134	0.22		A			False Positive Test	0.25	
Cesium-137	19	18.4	A		3.3	12.9 - 23.9	1	A
Cobalt-57	16	15.6	A		2.6	10.9 - 20.3	0.8	A
Cobalt-60	8.7	8.8	A		-1.1	6.2 - 11.4	0.4	A
Hydrogen-3	182	175	A		4.0	123 - 228	5	A
Iron-55	14.9	15.7	A		-5.1	11.0 - 20.4	0.8	A
Manganese-54	20.3	20.6	A		-1.5	14.4 - 26.8	0.8	A
Nickel-63	10.6	9.7	A		9.3	6.8 - 12.6	0.4	A
Plutonium-238	0.007	0.0063	A	(17)		Sensitivity Evaluation	0.004	
Plutonium-239/240	0.65	0.727	A		-10.6	0.509 - 0.945	0.06	A
Potassium-40	4.3		A			False Positive Test	3.1	
Radium-226	3.3	0.307	N		974.9	0.215 - 0.399	6.7	N

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	10	10.6	A		-5.7	7.4 - 13.8	3	W
Technetium-99	127		N	(1)		False Positive Test	6	
Uranium-234	1.15	1.07	A		7.5	0.75 - 1.39	0.07	A
Uranium-238	1.02	1.05	A		-2.9	0.74 - 1.37	0.06	A
Zinc-65	19	20.3	A		-6.4	14.2 - 26.4	0.9	A

Radiological Reference Date: August 1, 2019

**Result Flags:**

A = Result acceptable Bias <=20%

W = Result acceptable with warning 20% < Bias < 30%

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RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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**Notes:**

(1) = False Positive

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(4) = Sensitivity Evaluation

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(28) = Not Reporting Previously Reported Analyte

(29) = Statistically significant negative value at 3 standard deviations





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

Laboratory Results For MAPEP-19-MaW41  
 (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	11.5				8.1 - 15.0		
Arsenic	NR	2.53				1.77 - 3.29		
Barium	NR	1.32				0.92 - 1.72		
Beryllium	NR	4.55				3.19 - 5.92		
Cadmium	NR	0.433				0.303 - 0.563		
Chromium	NR	0.00061				Sensitivity Evaluation		
Cobalt	NR	14.4				10.1 - 18.7		
Copper	NR	16.1				11.3 - 20.9		
Lead	NR	0.547				0.383 - 0.711		
Mercury	NR	0.0921				0.0645 - 0.1197		
Nickel	NR	18.6				13.0 - 24.2		
Selenium	NR	0.535				0.375 - 0.696		
Technetium-99	NR					False Positive Test		
Thallium	NR					False Positive Test		
Uranium-235	NR	0.000604				4.23E-4 - 7.85E-4		
Uranium-238	NR	0.085				0.060 - 0.111		
Uranium-Total	NR	0.085				0.060 - 0.111		
Vanadium	NR	3.02				2.11 - 3.93		
Zinc	NR	5.38				3.77 - 6.99		

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.522				0.365 - 0.679		
Cesium-134	-0.0460		A			False Positive Test	0.0820	
Cesium-137	18.6	18.4	A		1.1	12.9 - 23.9	0.580	A
Cobalt-57	15.0	15.6	A		-3.8	10.9 - 20.3	0.416	A
Cobalt-60	8.42	8.8	A		-4.3	6.2 - 11.4	0.229	A
Hydrogen-3	NR	175				123 - 228		
Iron-55	NR	15.7				11.0 - 20.4		
Manganese-54	19.9	20.6	A		-3.4	14.4 - 26.8	0.546	A
Nickel-63	NR	9.7				6.8 - 12.6		
Plutonium-238	NR	0.0063				Sensitivity Evaluation		
Plutonium-239/240	NR	0.727				0.509 - 0.945		
Potassium-40	0.334		A			False Positive Test	1.07	
Radium-226	NR	0.307				0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	10.2	10.6	A		-3.8	7.4 - 13.8	0.293	A
Technetium-99	NR					False Positive Test		
Uranium-234	NR	1.07				0.75 - 1.39		
Uranium-238	NR	1.05				0.74 - 1.37		
Zinc-65	20.7	20.3	A		2.0	14.2 - 26.4	0.953	A

Radiological Reference Date: August 1, 2019

**Result Flags:**

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RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

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**Notes:**

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- (4) = Sensitivity Evaluation
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
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Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

*Laboratory Results For MAPEP-19-MaW41*

(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	11.5			8.1 - 15.0		
Arsenic	NR	2.53			1.77 - 3.29		
Barium	NR	1.32			0.92 - 1.72		
Beryllium	NR	4.55			3.19 - 5.92		
Cadmium	NR	0.433			0.303 - 0.563		
Chromium	NR	0.00061			Sensitivity Evaluation		
Cobalt	NR	14.4			10.1 - 18.7		
Copper	NR	16.1			11.3 - 20.9		
Lead	NR	0.547			0.383 - 0.711		
Mercury	NR	0.0921			0.0645 - 0.1197		
Nickel	NR	18.6			13.0 - 24.2		
Selenium	NR	0.535			0.375 - 0.696		
Technetium-99	NR				False Positive Test		
Thallium	NR				False Positive Test		
Uranium-235	0.00054	0.000604	A	-10.6	4.23E-4 - 7.85E-4	0.00002	A
Uranium-238	0.074	0.085	A	-12.9	0.060 - 0.111	0.002	A
Uranium-Total	0.075	0.085	A	-11.8	0.060 - 0.111	0.002	A
Vanadium	NR	3.02			2.11 - 3.93		
Zinc	NR	5.38			3.77 - 6.99		

Radiological						Units: (Bq/L)	
Analyte	Result	Ref Value	Flag Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.522			0.365 - 0.679		
Cesium-134	NR				False Positive Test		
Cesium-137	NR	18.4			12.9 - 23.9		
Cobalt-57	NR	15.6			10.9 - 20.3		
Cobalt-60	NR	8.8			6.2 - 11.4		
Hydrogen-3	NR	175			123 - 228		
Iron-55	NR	15.7			11.0 - 20.4		
Manganese-54	NR	20.6			14.4 - 26.8		
Nickel-63	NR	9.7			6.8 - 12.6		
Plutonium-238	NR	0.0063			Sensitivity Evaluation		
Plutonium-239/240	NR	0.727			0.509 - 0.945		
Potassium-40	NR				False Positive Test		
Radium-226	NR	0.307			0.215 - 0.399		

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	NR	10.6				7.4 - 13.8		
Technetium-99	NR					False Positive Test		
Uranium-234	NR	1.07				0.75 - 1.39		
Uranium-238	NR	1.05				0.74 - 1.37		
Zinc-65	NR	20.3				14.2 - 26.4		

Radiological Reference Date: August 1, 2019

**Result Flags:**

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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%

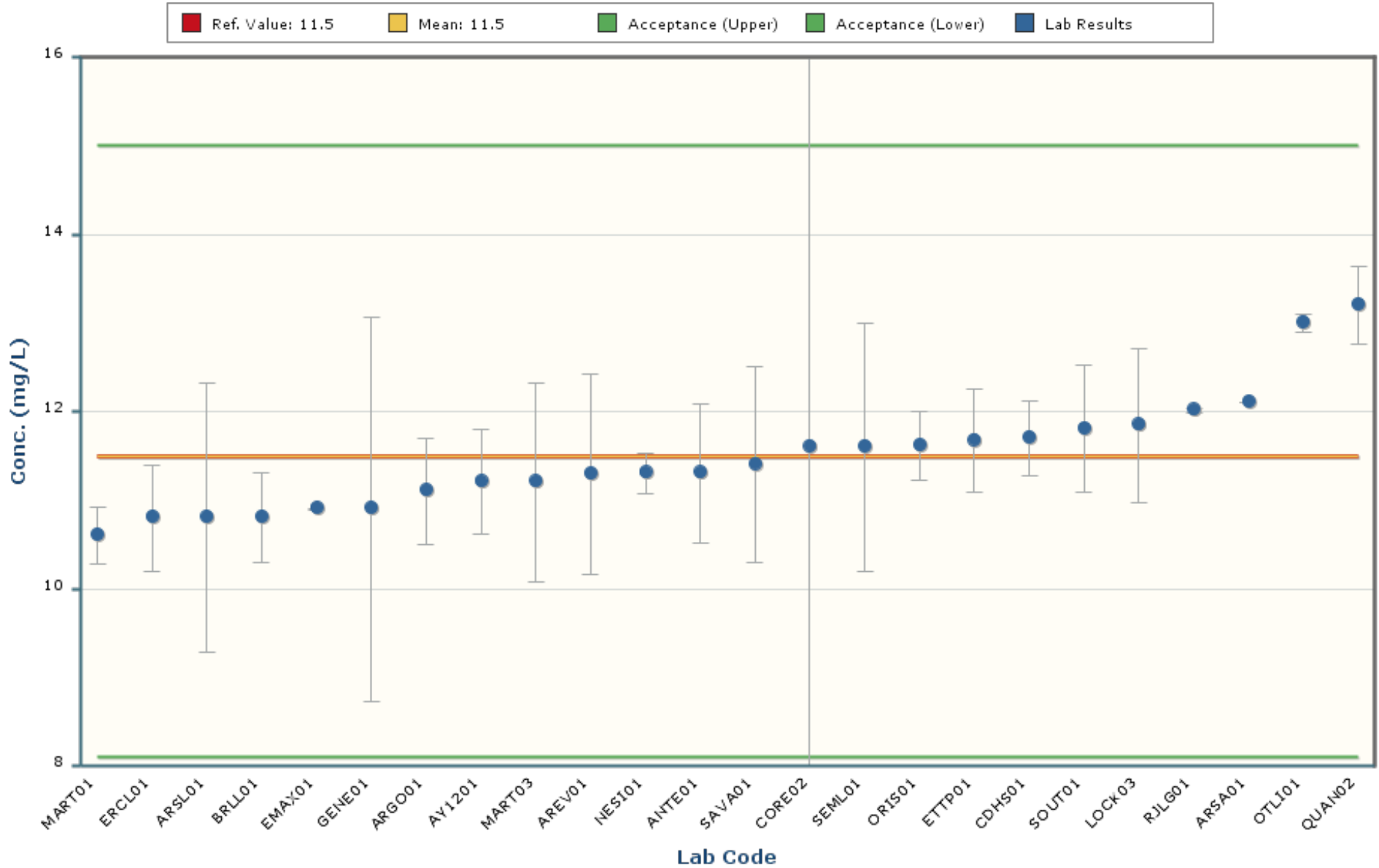
RP = Relative Precision

**Notes:**

- (1) = False Positive
- (2) = False Negative
- (4) = Sensitivity Evaluation
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# Antimony

## MAPEP-19-MaW41



### Notes:

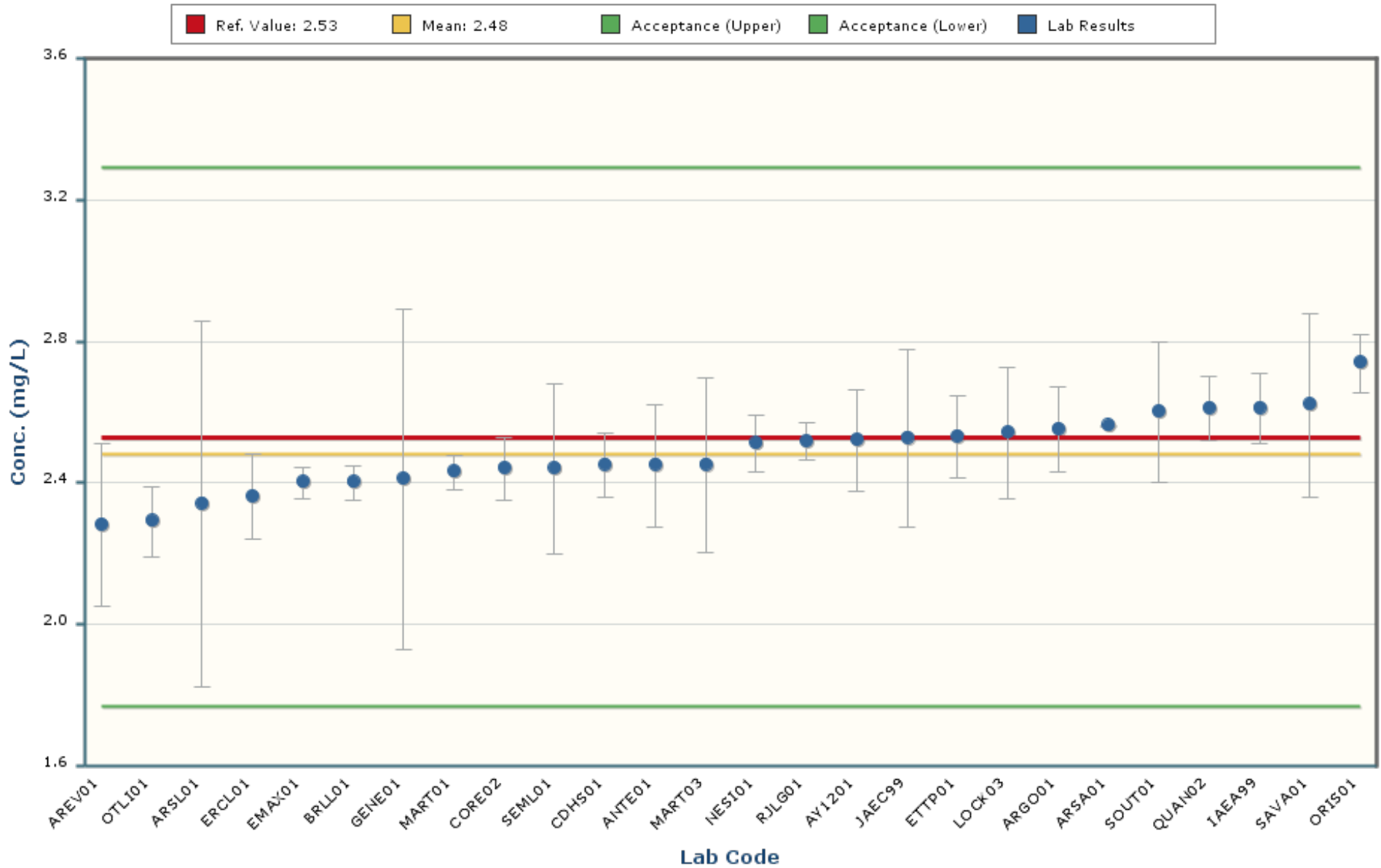
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 8.3 and 14.7 ( $\pm 5$  Standard Deviations).

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

# Arsenic

## MAPEP-19-MaW41



### Notes:

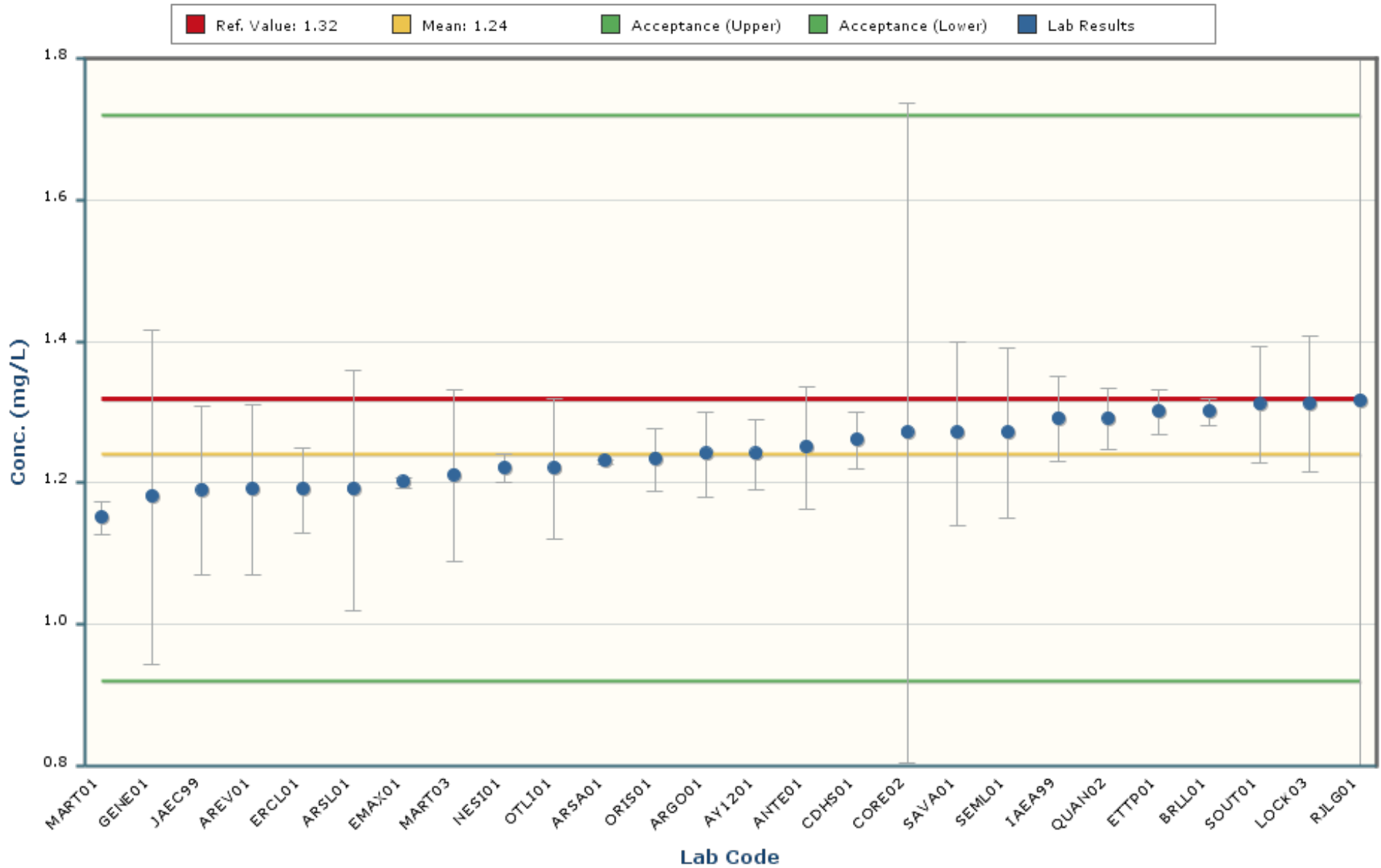
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 1.94 and 3.03 ( $\pm 5$  Standard Deviations).

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

# Barium

## MAPEP-19-MaW41



### Notes:

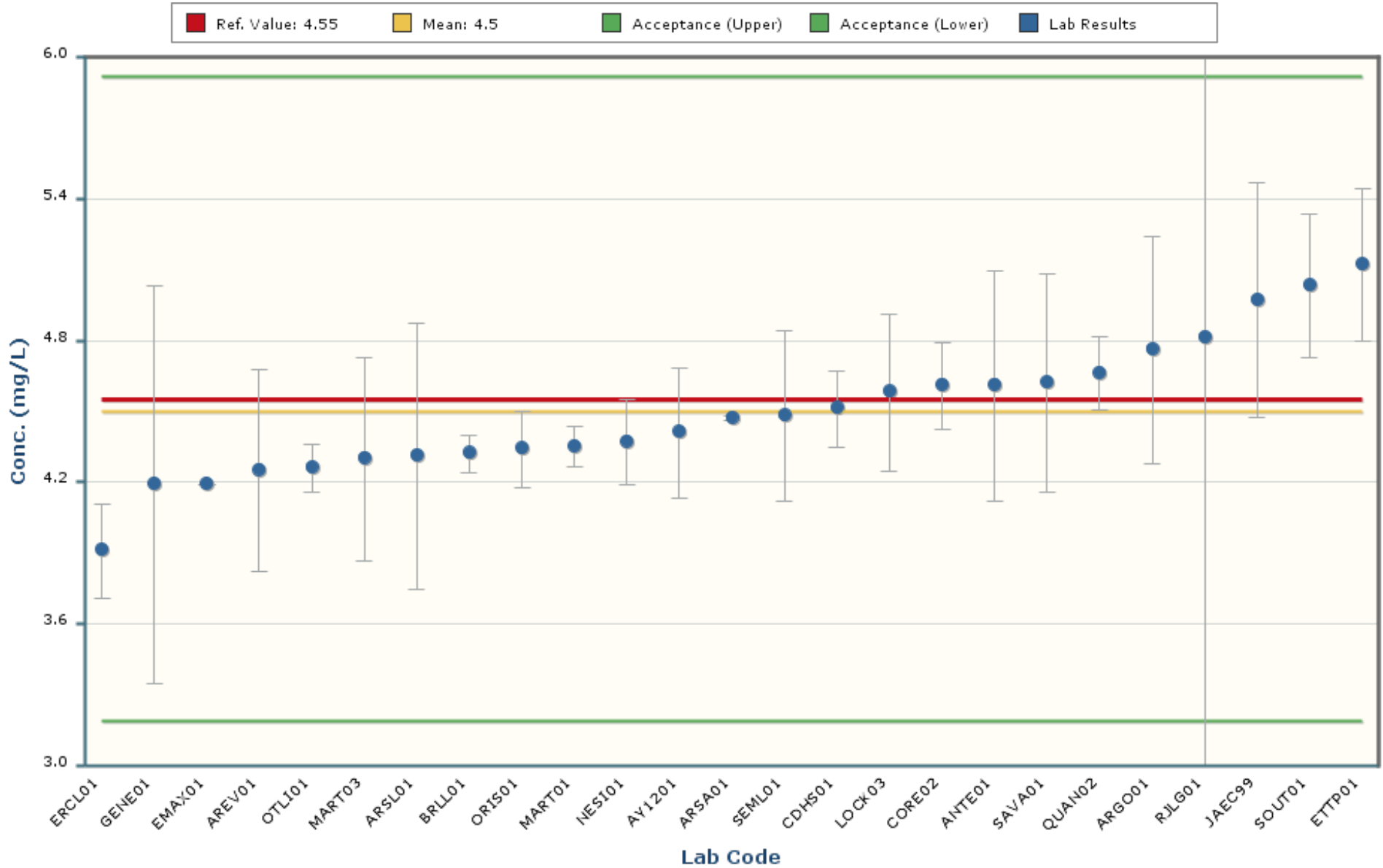
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 1.01 and 1.48 ( $\pm 5$  Standard Deviations).

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

# Beryllium

## MAPEP-19-MaW41



### Notes:

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

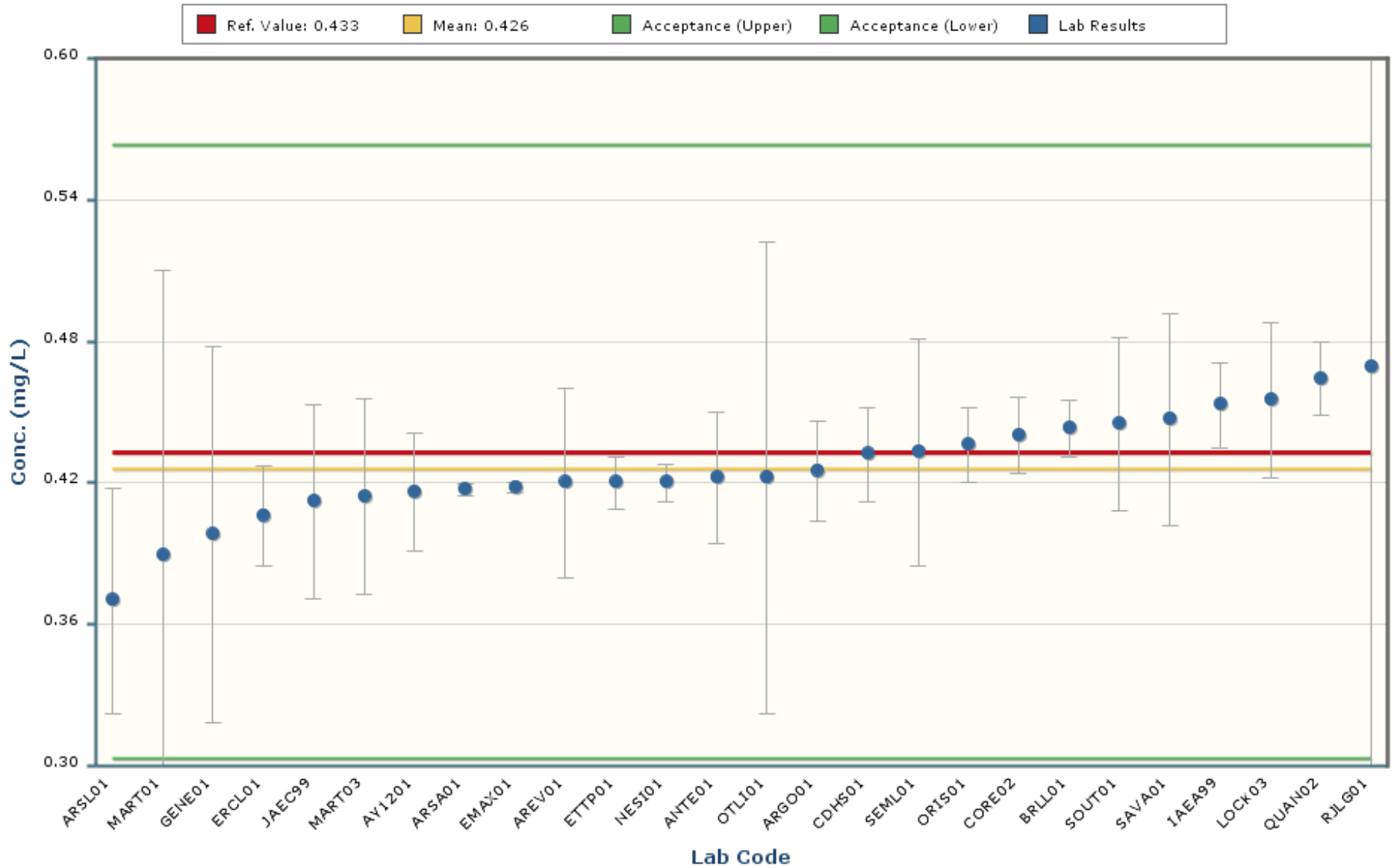
The chart shows only data points with values between 3.07 and 5.93 ( $\pm 5$  Standard Deviations).

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



# Cadmium

## MAPEP-19-MaW41



### Notes:

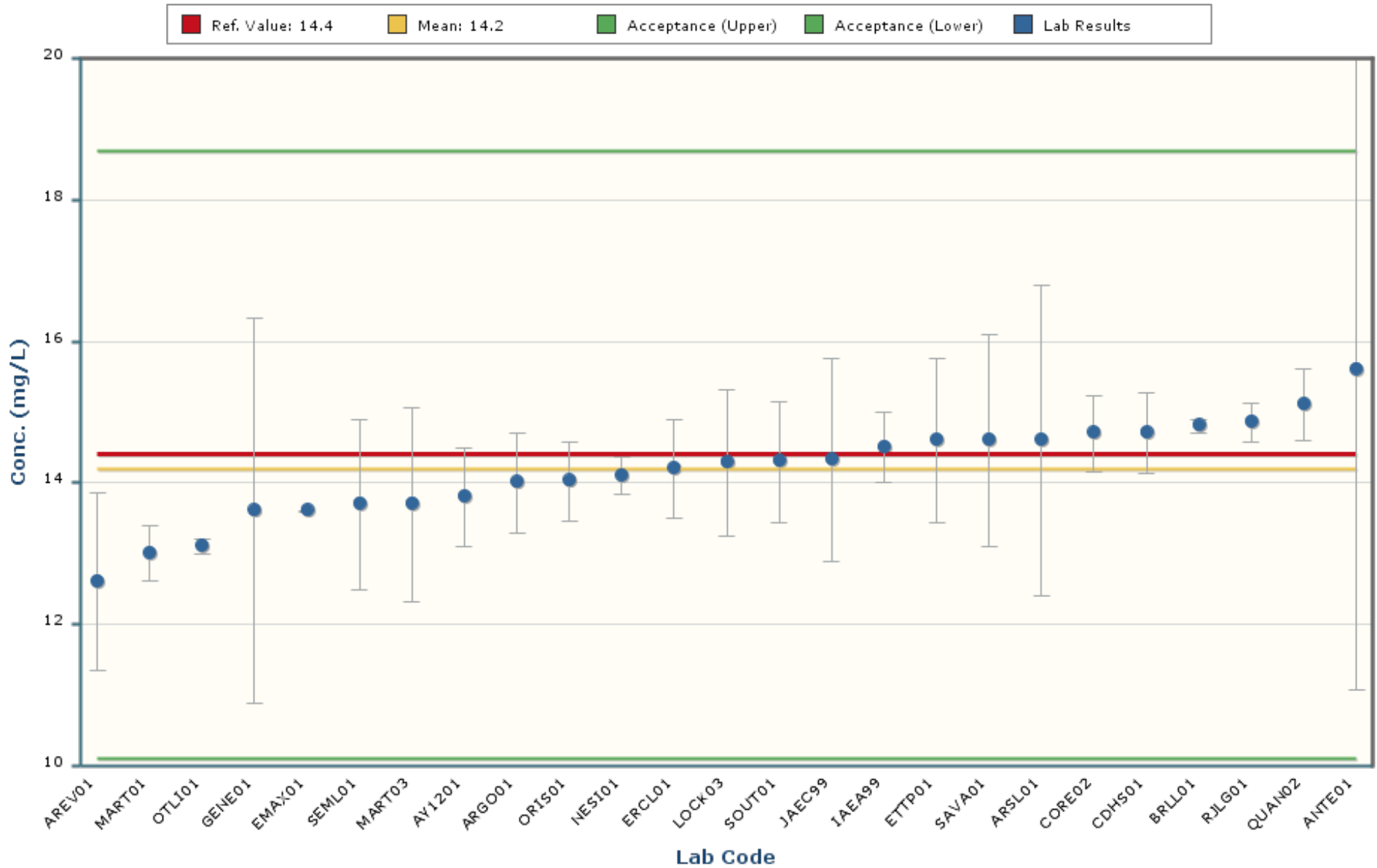
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 0.313 and 0.539 ( $\pm 5$  Standard Deviations).

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

# Cobalt

## MAPEP-19-MaW41



### Notes:

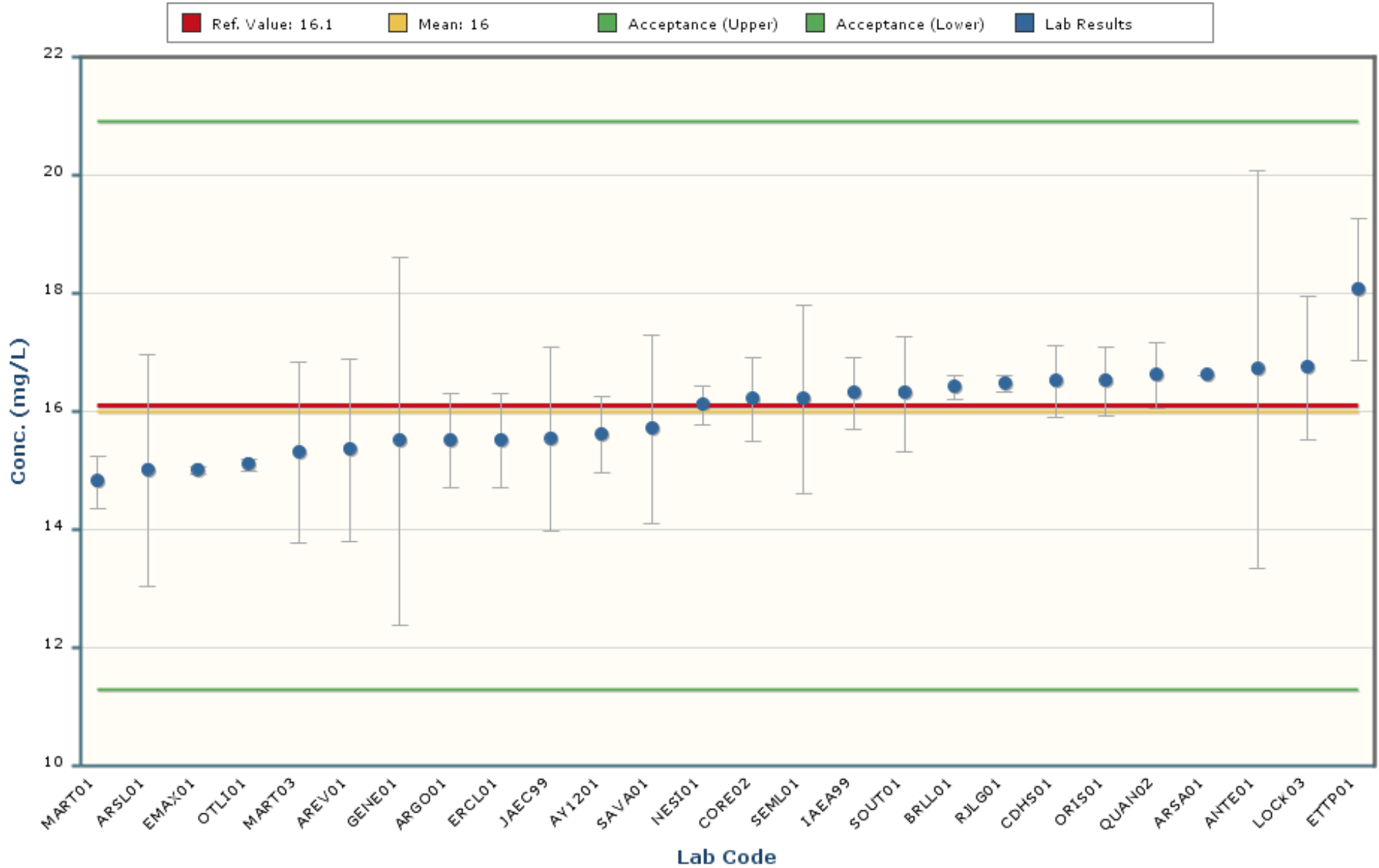
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 10.7 and 17.6 ( $\pm 5$  Standard Deviations).

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

# Copper

## MAPEP-19-MaW41



### Notes:

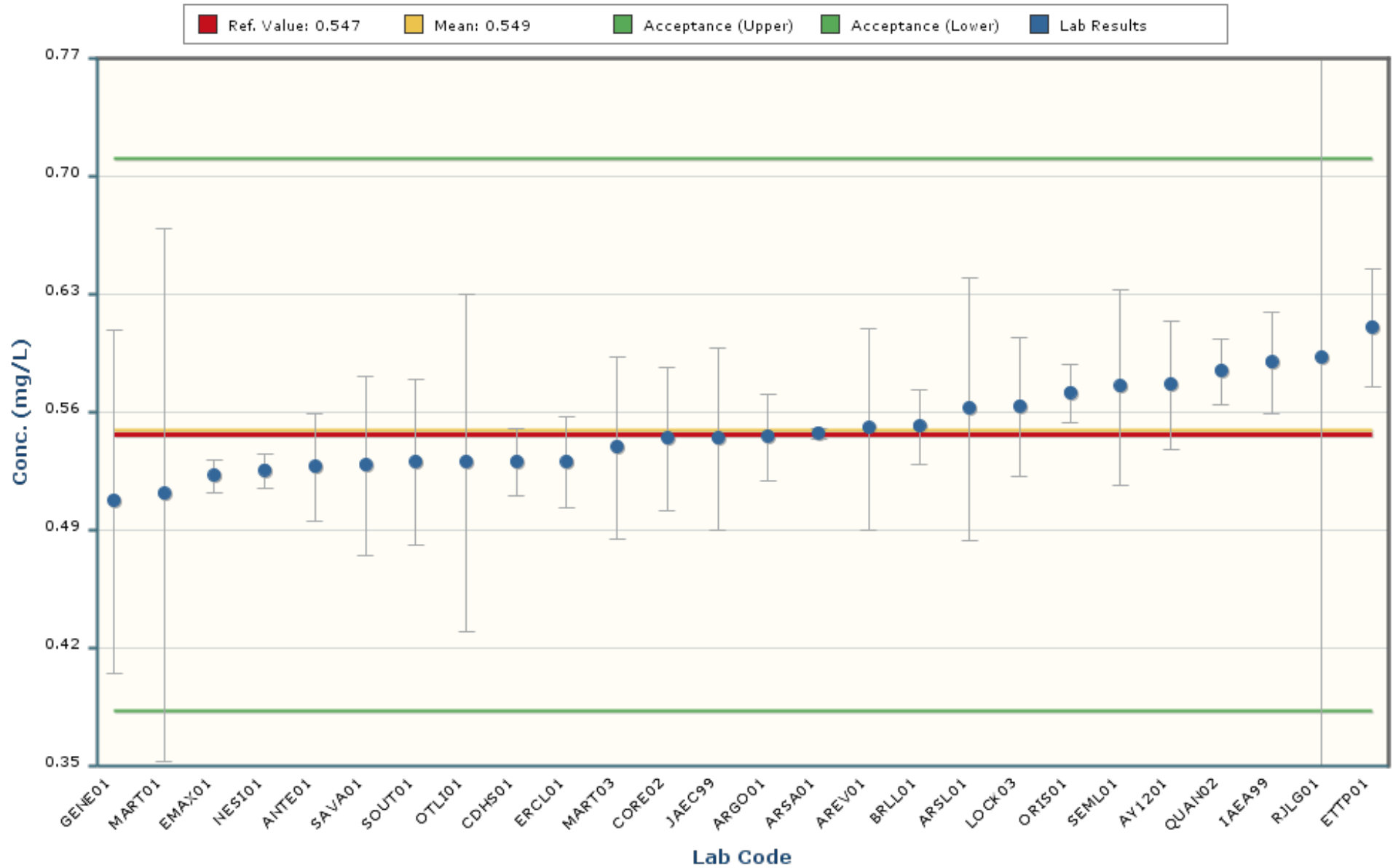
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 12.3 and 19.7 ( $\pm 5$  Standard Deviations).

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

# Lead

## MAPEP-19-MaW41



### Notes:

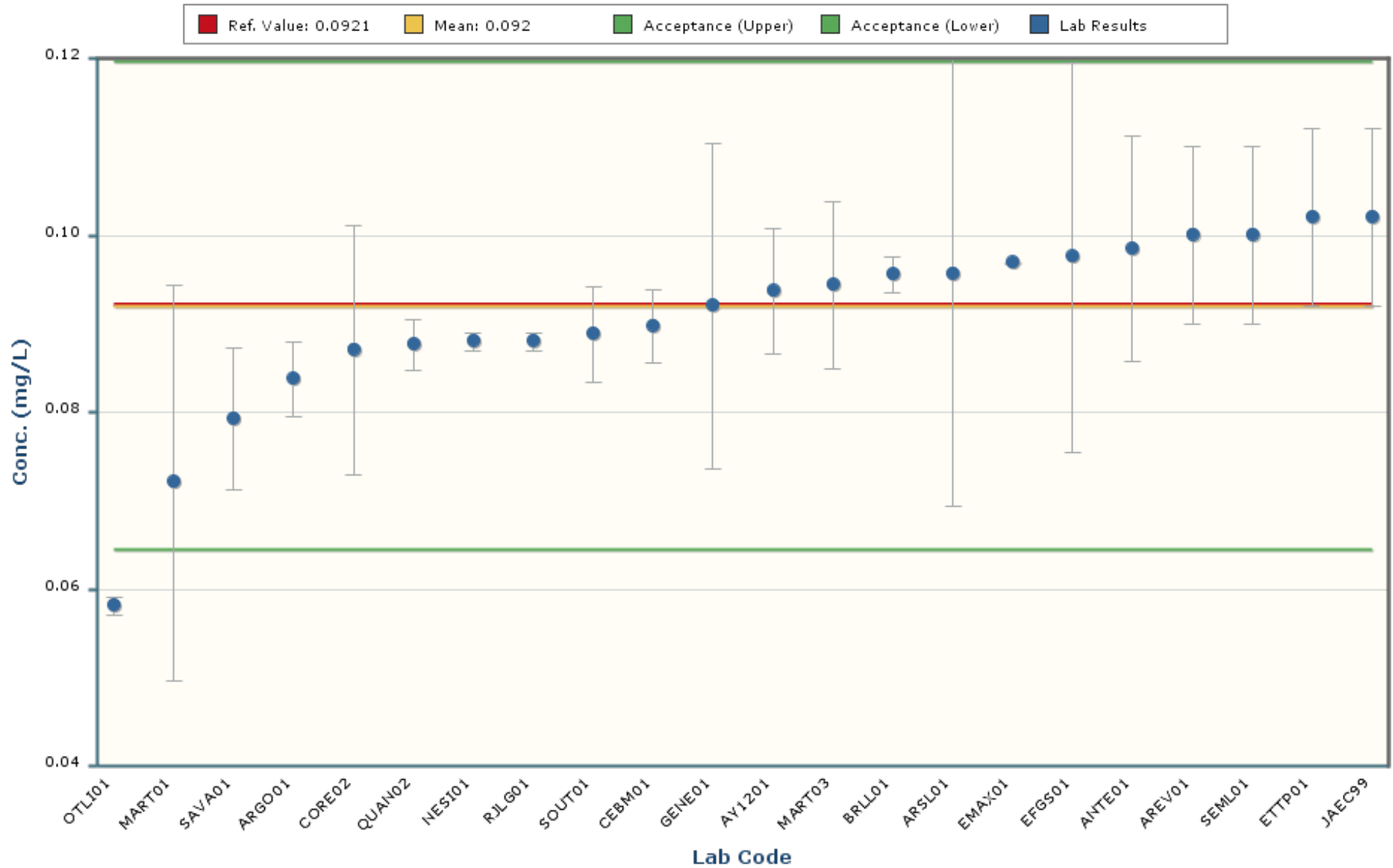
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 0.416 and 0.682 ( $\pm 5$  Standard Deviations).

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

# Mercury

## MAPEP-19-MaW41



### Notes:

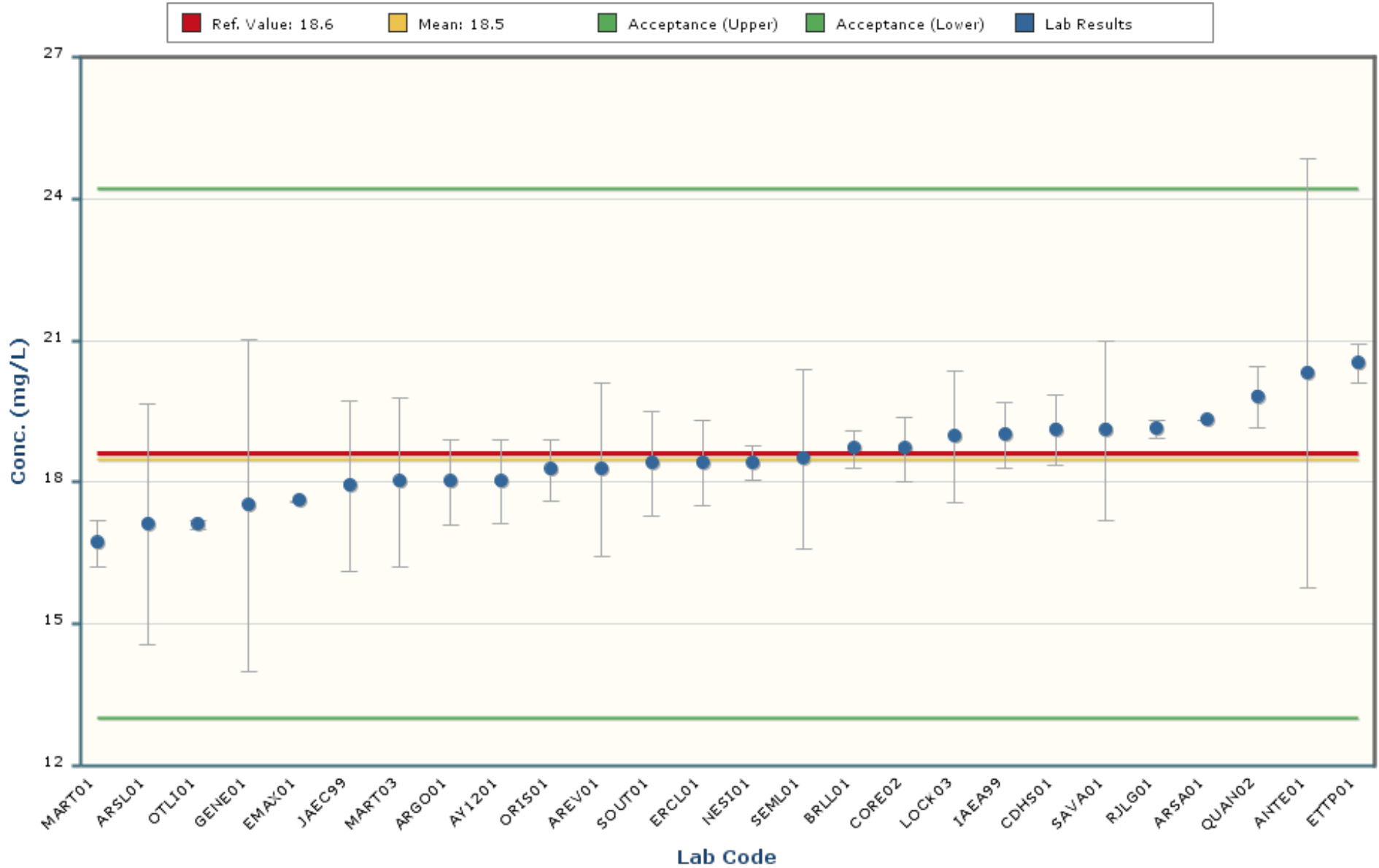
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 0.0536 and 0.1304 ( $\pm 5$  Standard Deviations).

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

# Nickel

## MAPEP-19-MaW41



### Notes:

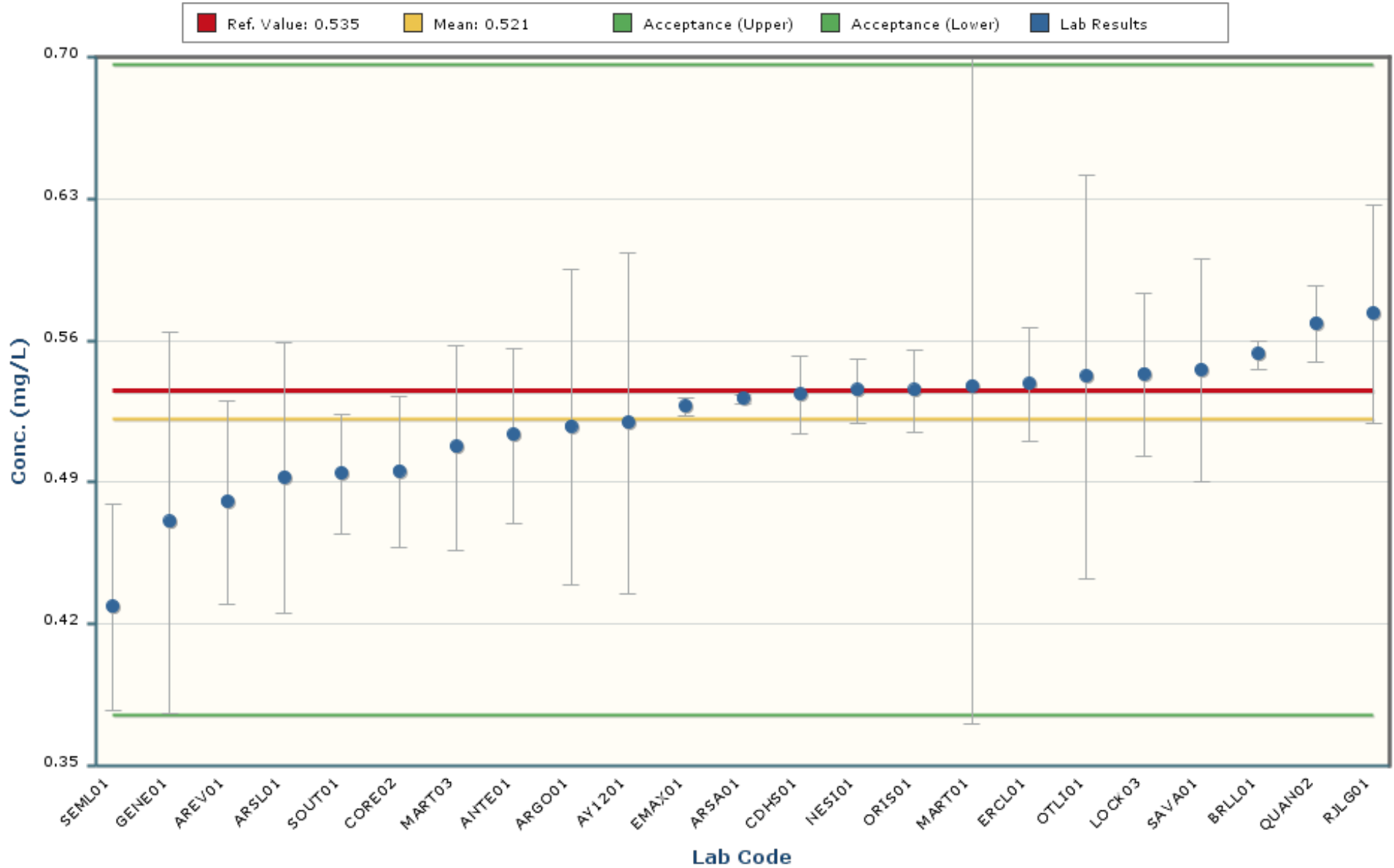
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 13.9 and 23.1 ( $\pm 5$  Standard Deviations).

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

# Selenium

## MAPEP-19-MaW41



### Notes:

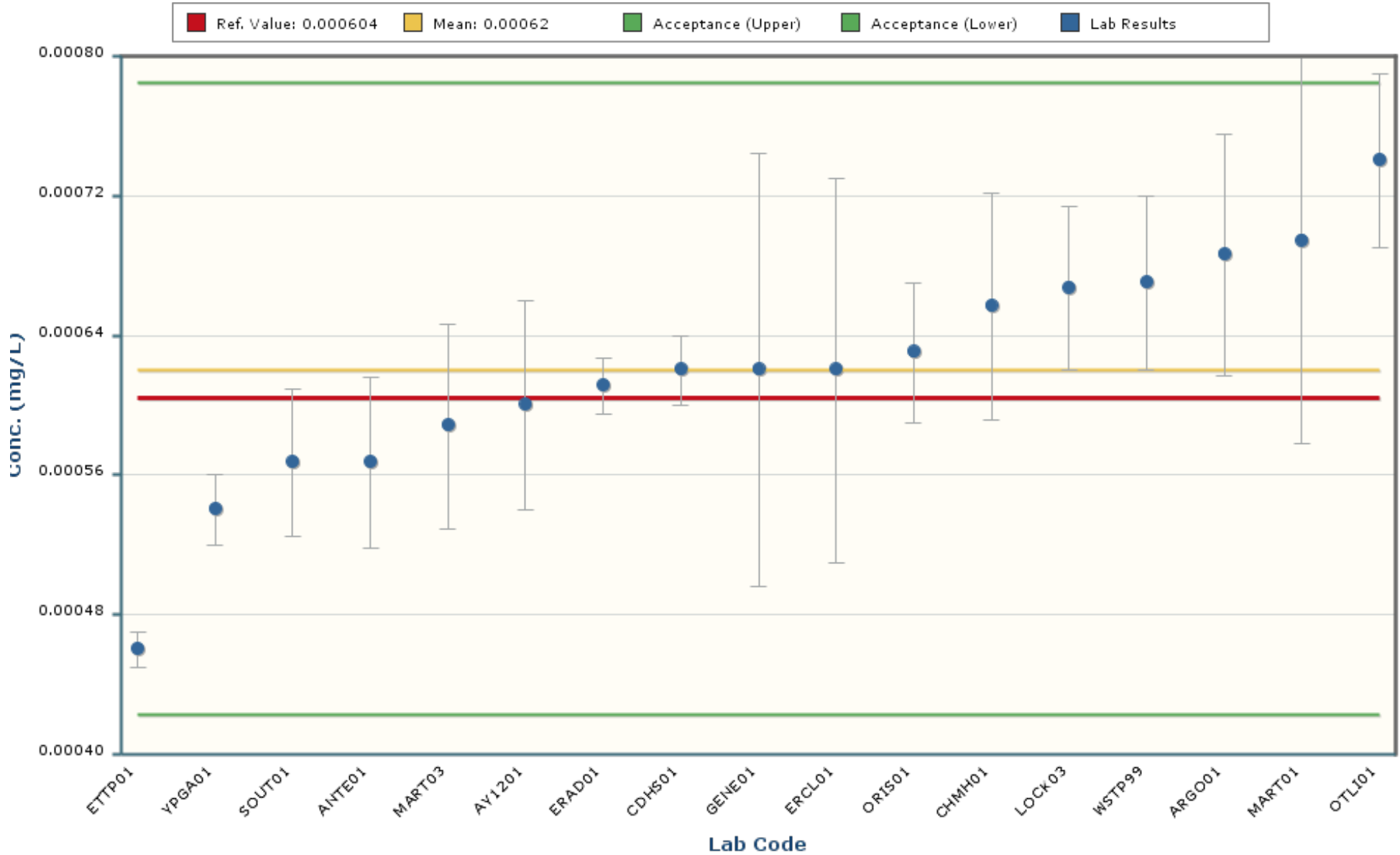
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 0.355 and 0.686 ( $\pm 5$  Standard Deviations).

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

# Uranium-235

## MAPEP-19-MaW41

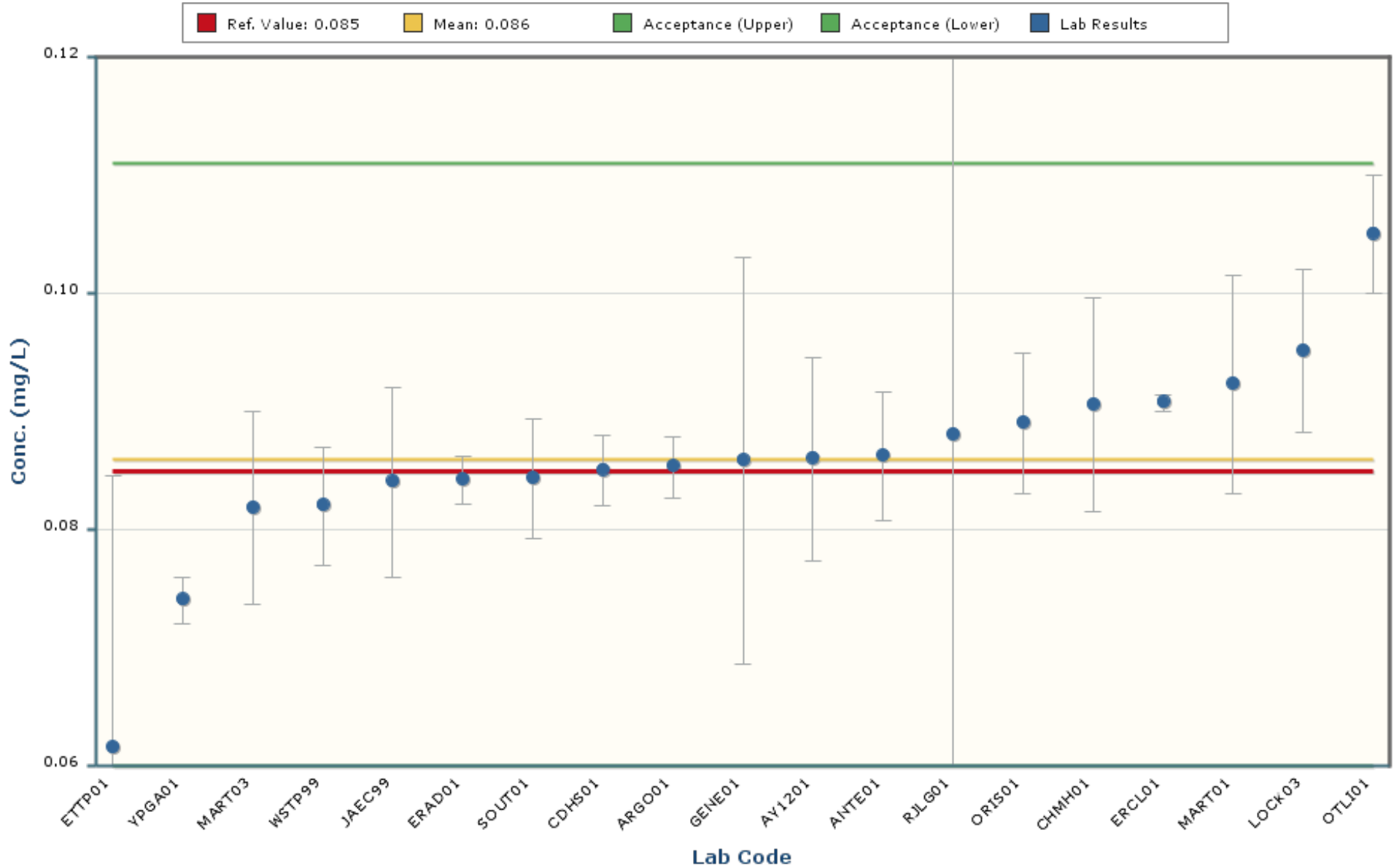


Notes:  
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .  
The chart shows only data points with values between 0.000290 and 0.000949 ( $\pm 5$  Standard Deviations).  
The error bars encompassing each result are plotted at  $\pm 1$  standard deviation.



# Uranium-238

## MAPEP-19-MaW41



### Notes:

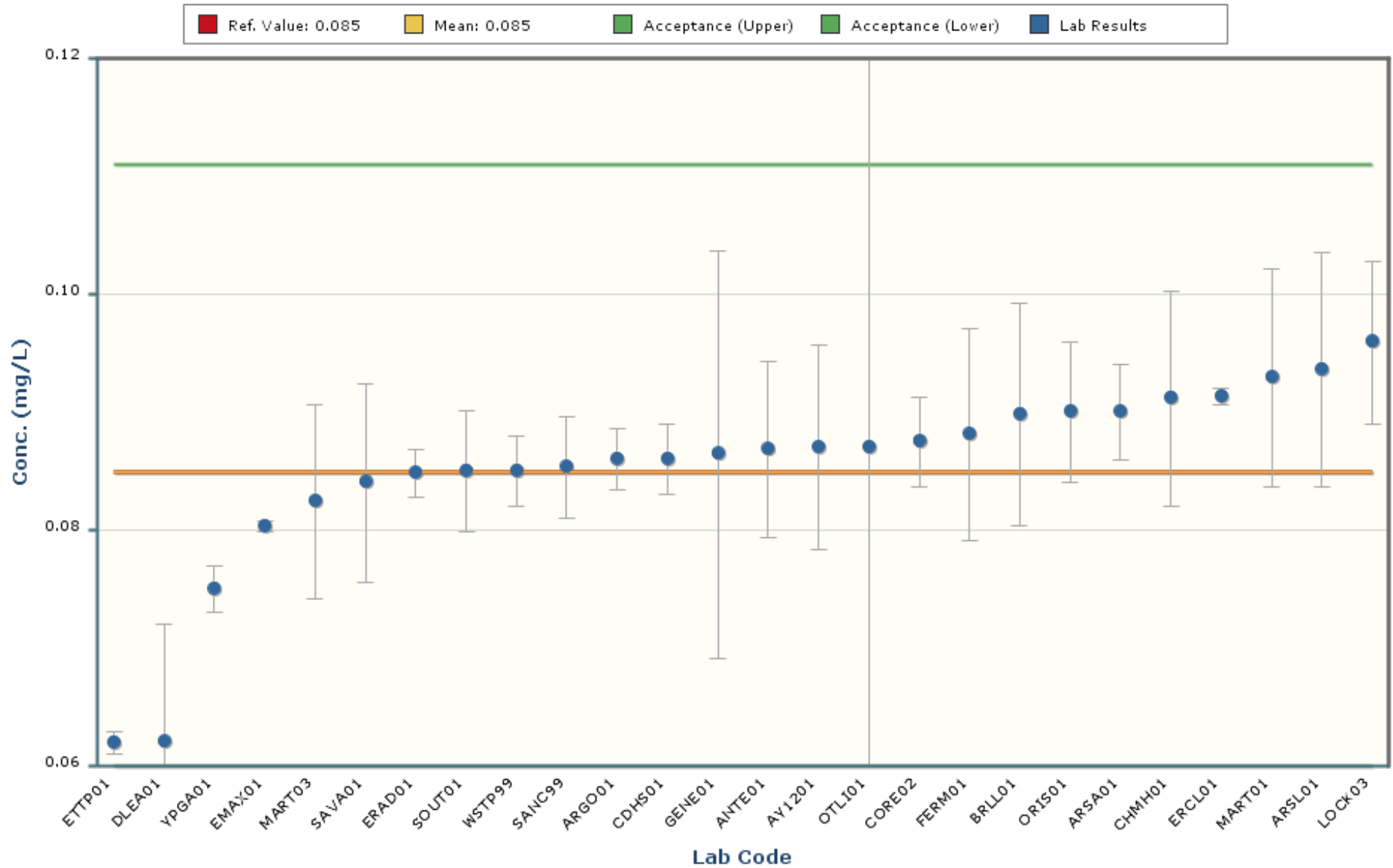
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 0.043 and 0.129 ( $\pm 5$  Standard Deviations).

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

# Uranium-Total

## MAPEP-19-MaW41



### Notes:

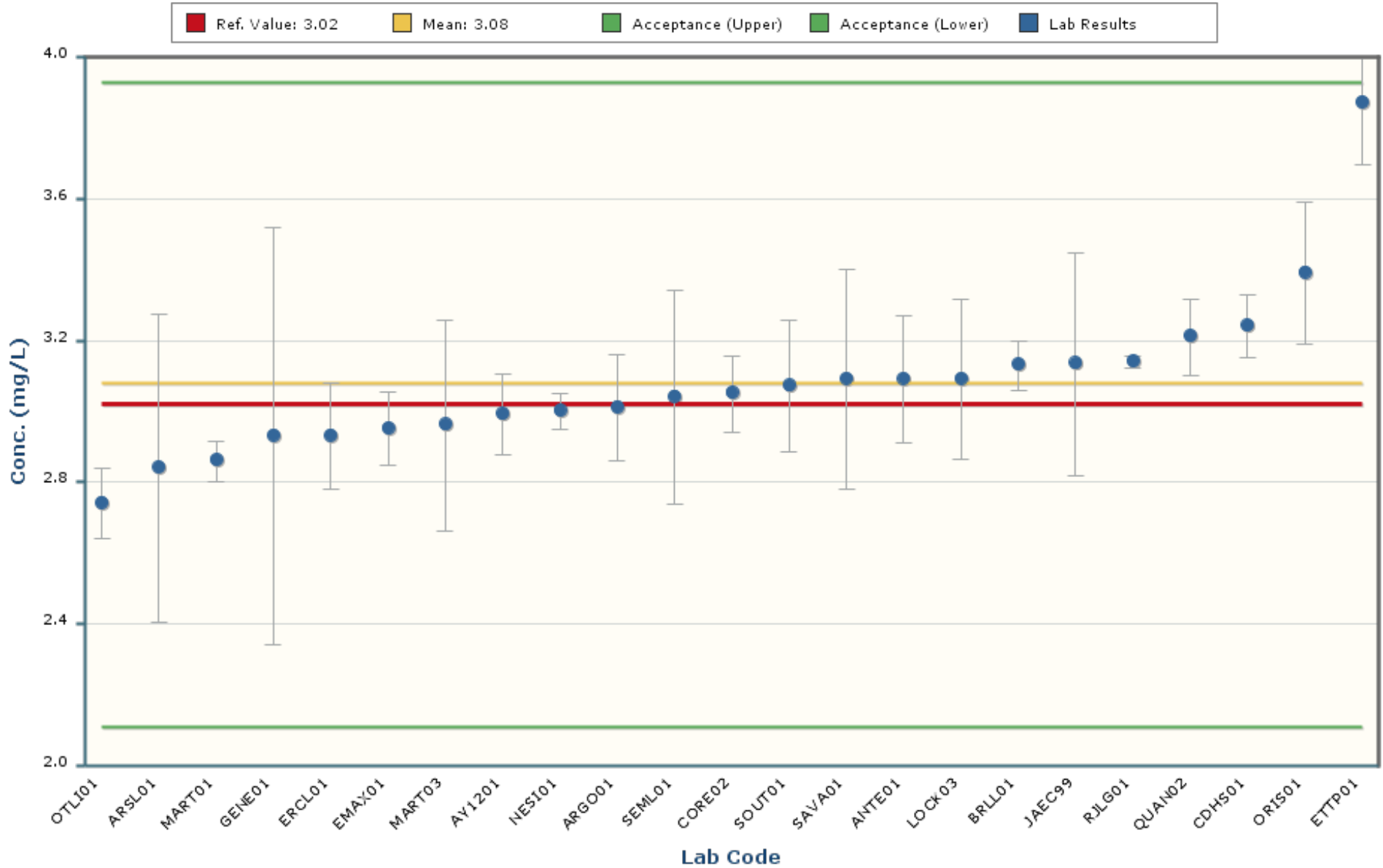
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 0.045 and 0.126 ( $\pm 5$  Standard Deviations).

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

# Vanadium

MAPEP-19-MaW41



## Notes:

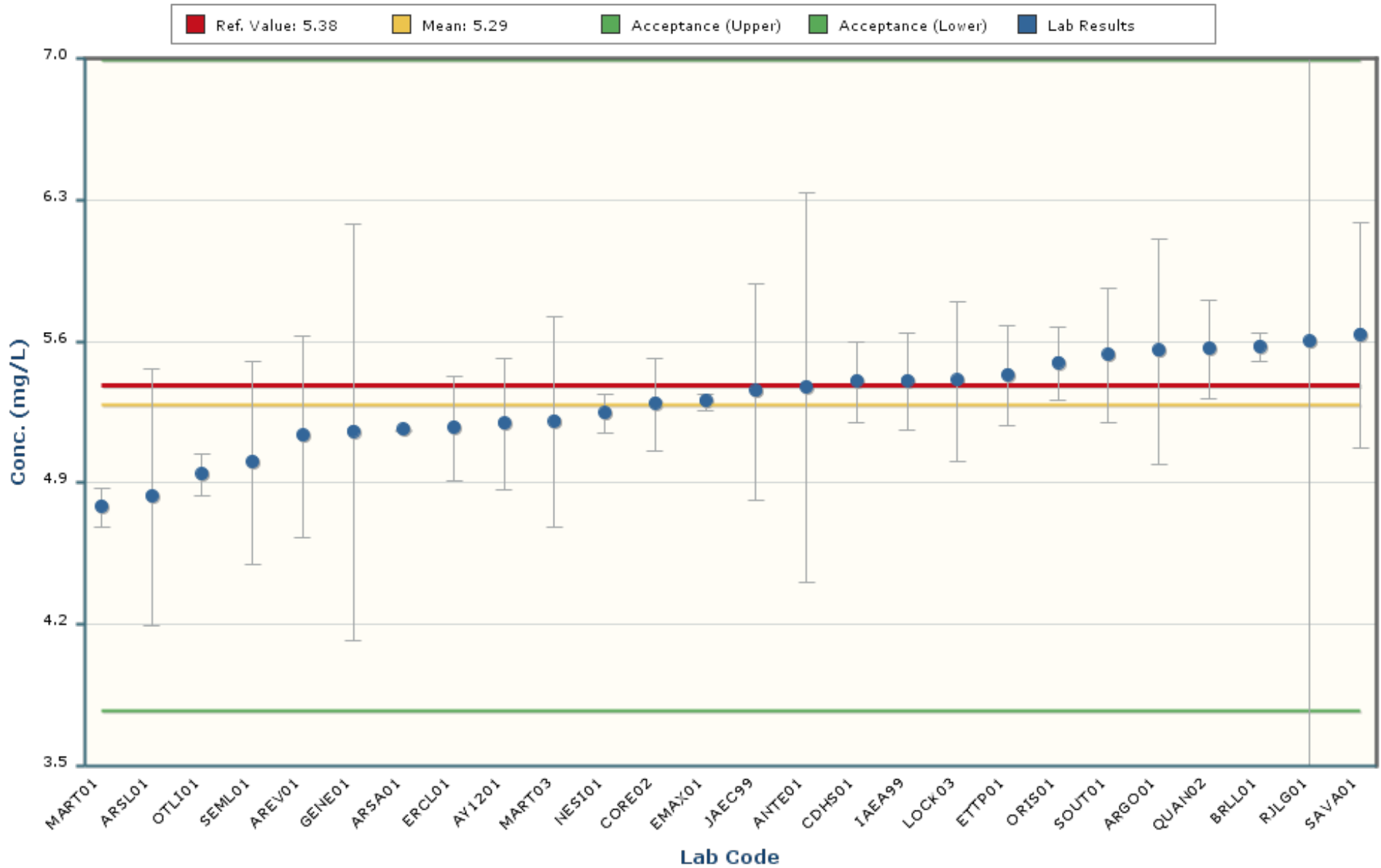
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 1.96 and 4.19 ( $\pm 5$  Standard Deviations).

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

# Zinc

## MAPEP-19-MaW41



### Notes:

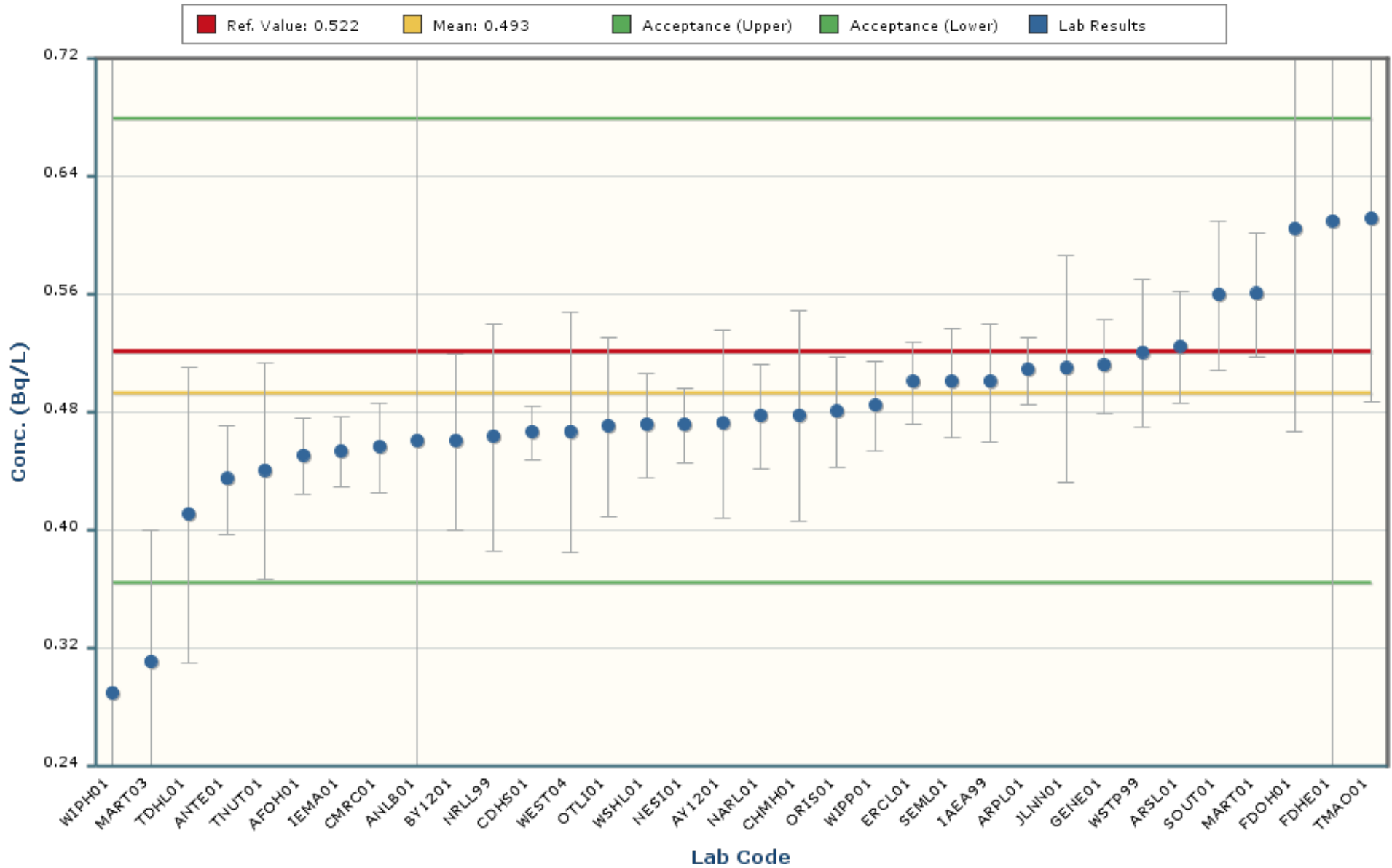
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 4.13 and 6.46 ( $\pm 5$  Standard Deviations).

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

# Americium-241

## MAPEP-19-MaW41



### Notes:

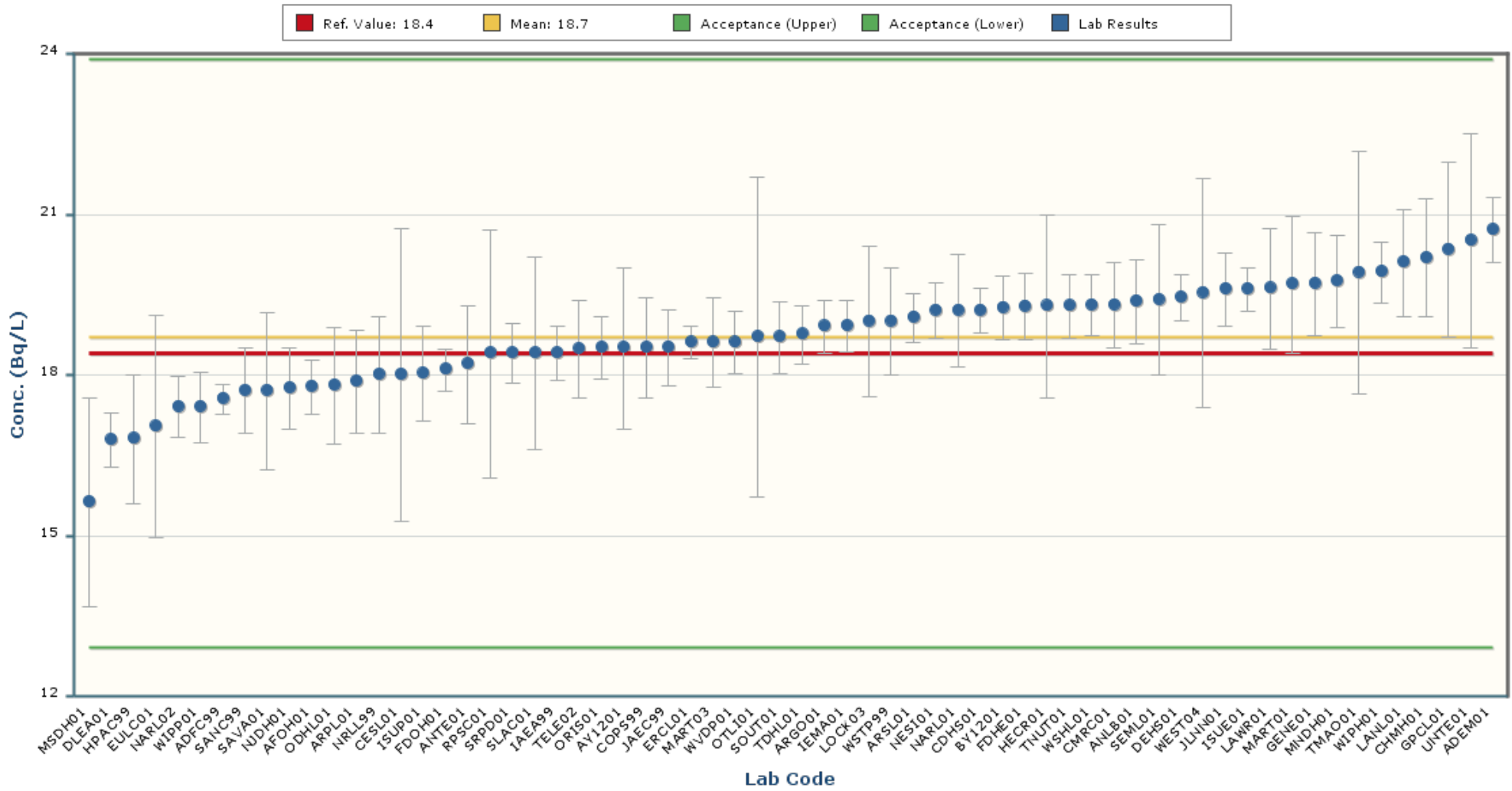
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 0.245 and 0.741 ( $\pm 5$  Standard Deviations).

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

# Cesium-137

## MAPEP-19-MaW41

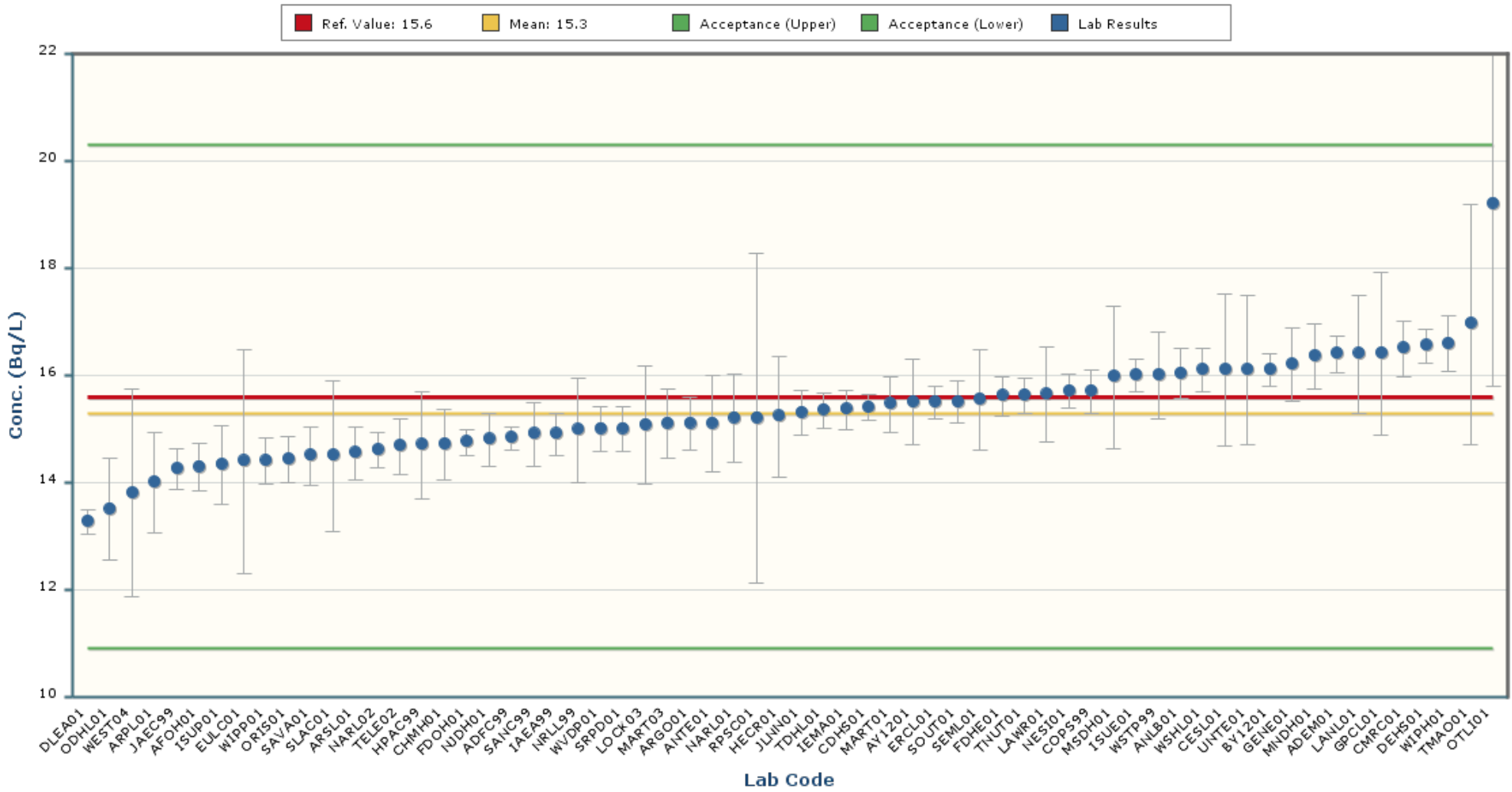


### Notes:

- The chart mean excludes values outside of a bias range of  $\pm 30\%$ .
- The chart shows only data points with values between 13.9 and 23.6 ( $\pm 5$  Standard Deviations).
- The error bars encompassing each result are plotted at  $\pm$  one standard deviation.

# Cobalt-57

## MAPEP-19-MaW41

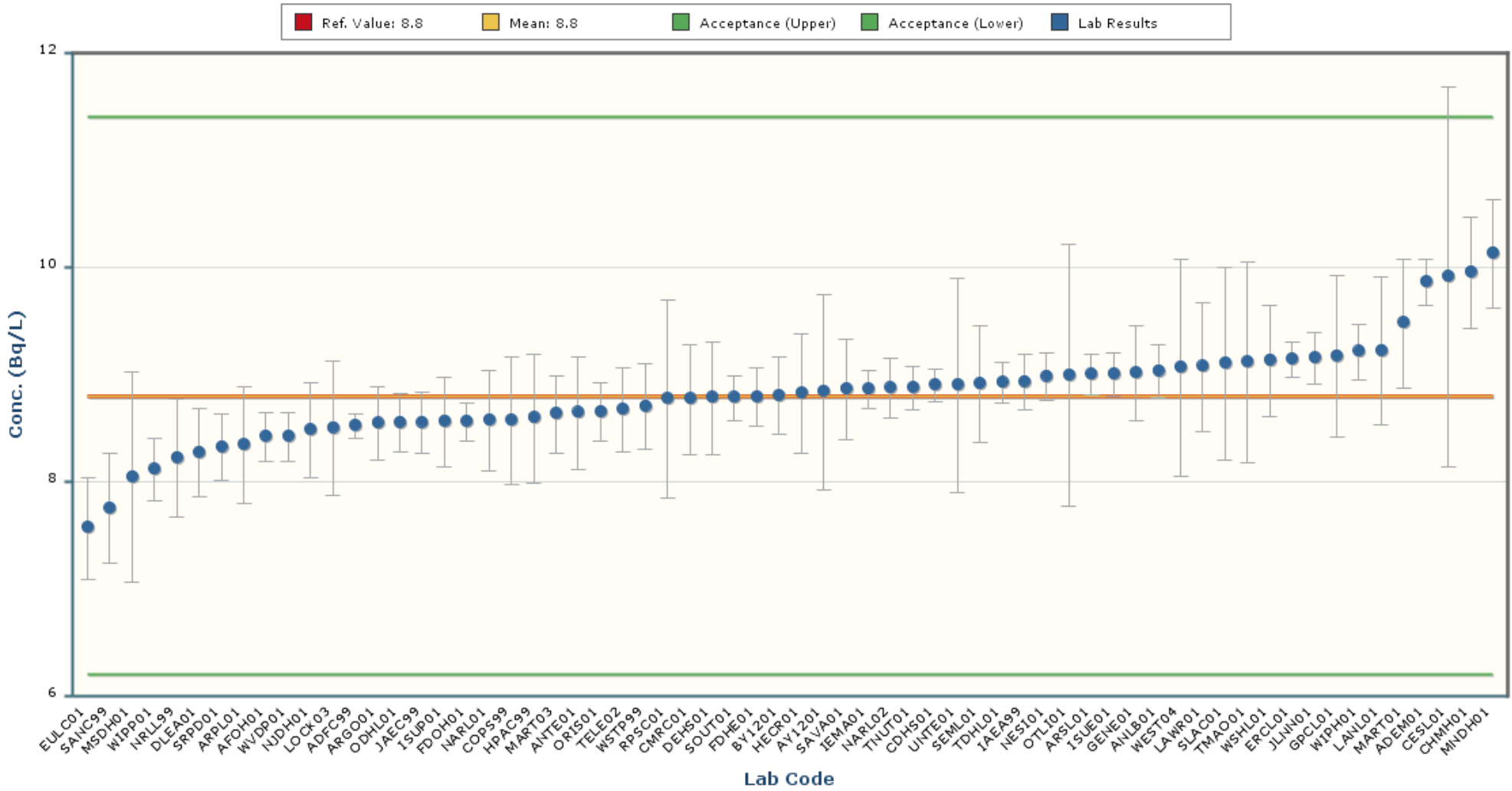


### Notes:

- The chart mean excludes values outside of a bias range of  $\pm 30\%$ .
- The chart shows only data points with values between 10.6 and 20.0 ( $\pm 5$  Standard Deviations).
- The error bars encompassing each result are plotted at  $\pm$  one standard deviation.

# Cobalt-60

## MAPEP-19-MaW41



### Notes:

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

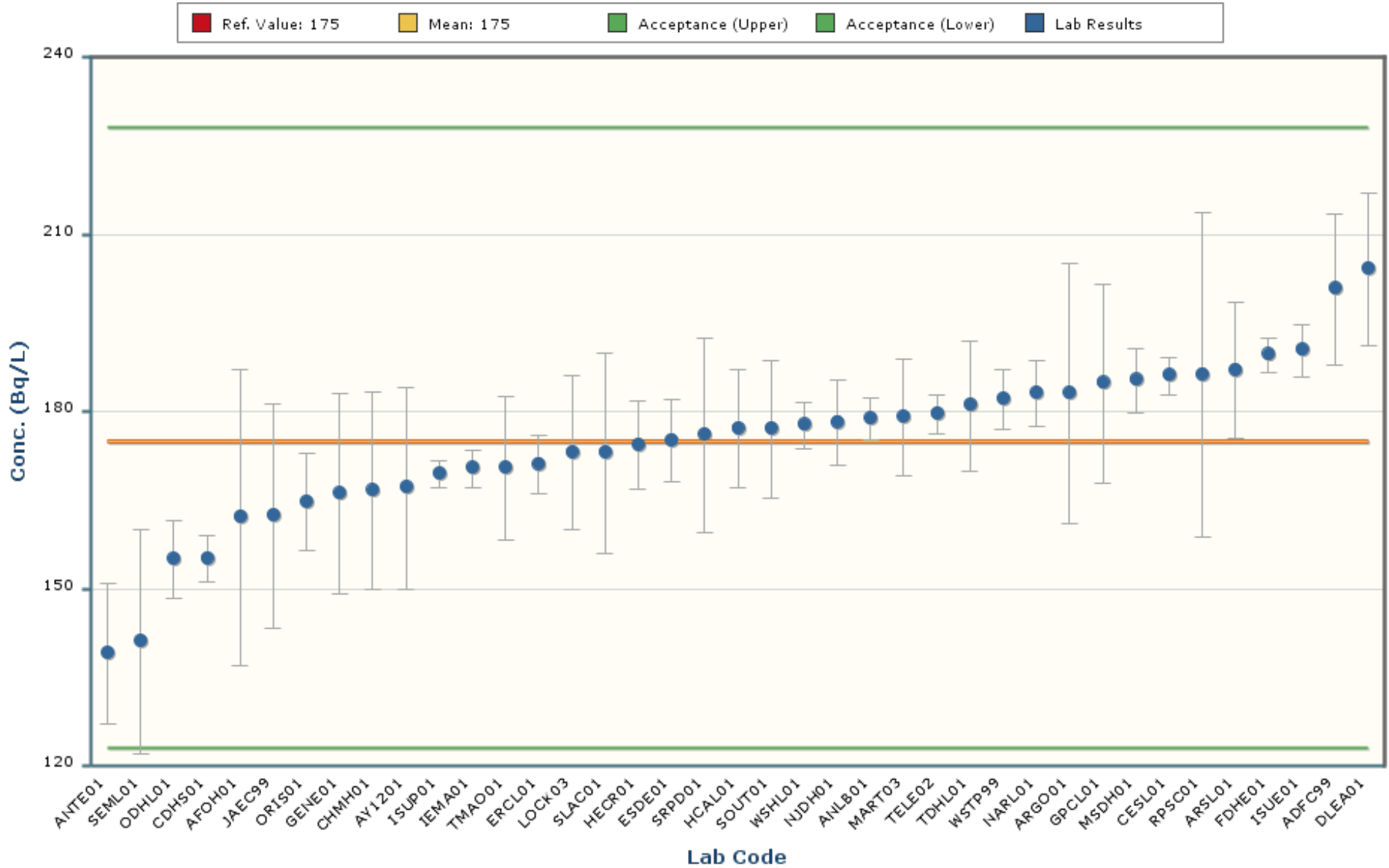
The chart shows only data points with values between 6.5 and 11.1 ( $\pm 5$  Standard Deviations).

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



# Hydrogen-3

MAPEP-19-MaW41



## Notes:

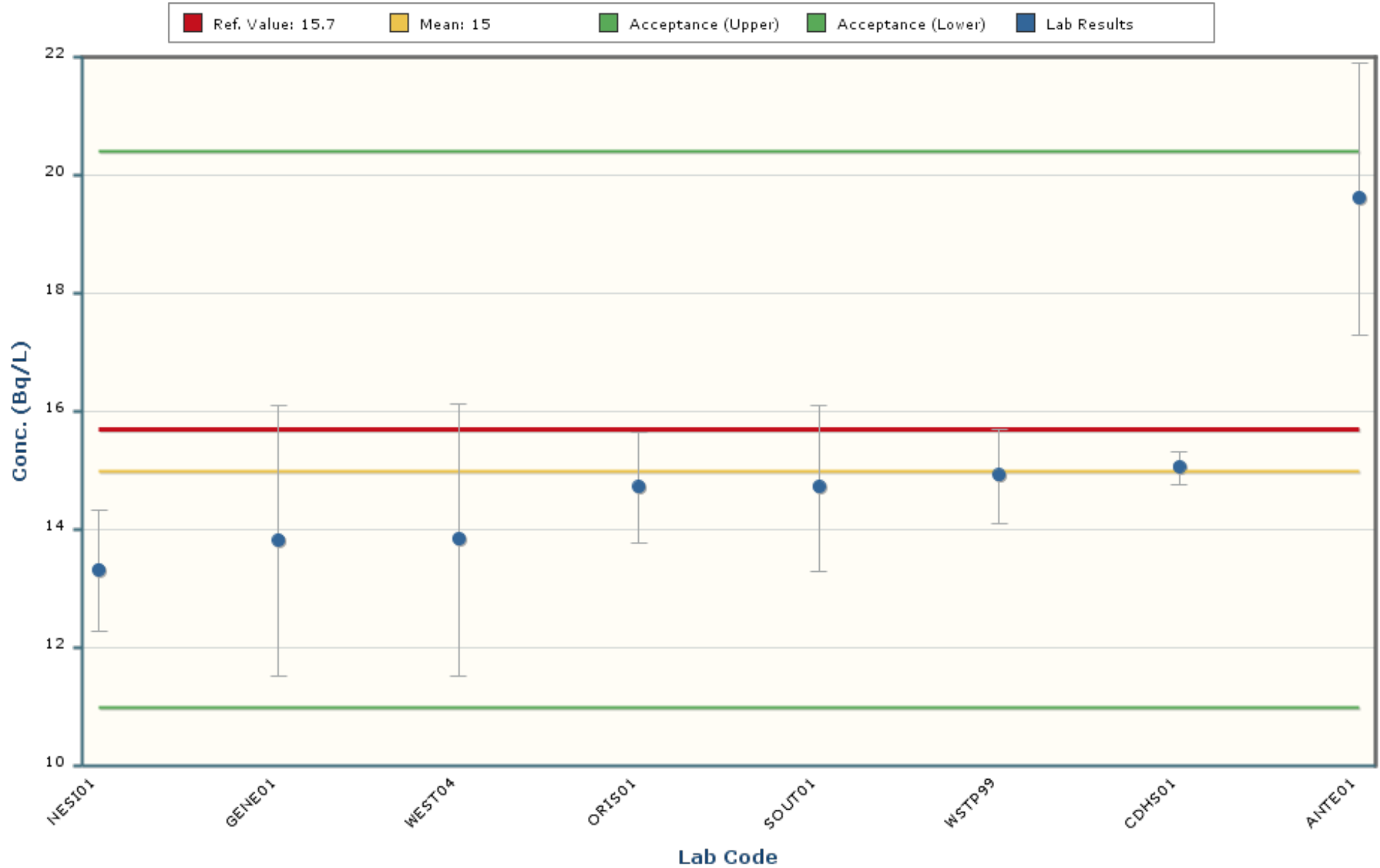
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 108 and 242 ( $\pm 5$  Standard Deviations).

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

# Iron-55

## MAPEP-19-MaW41



### Notes:

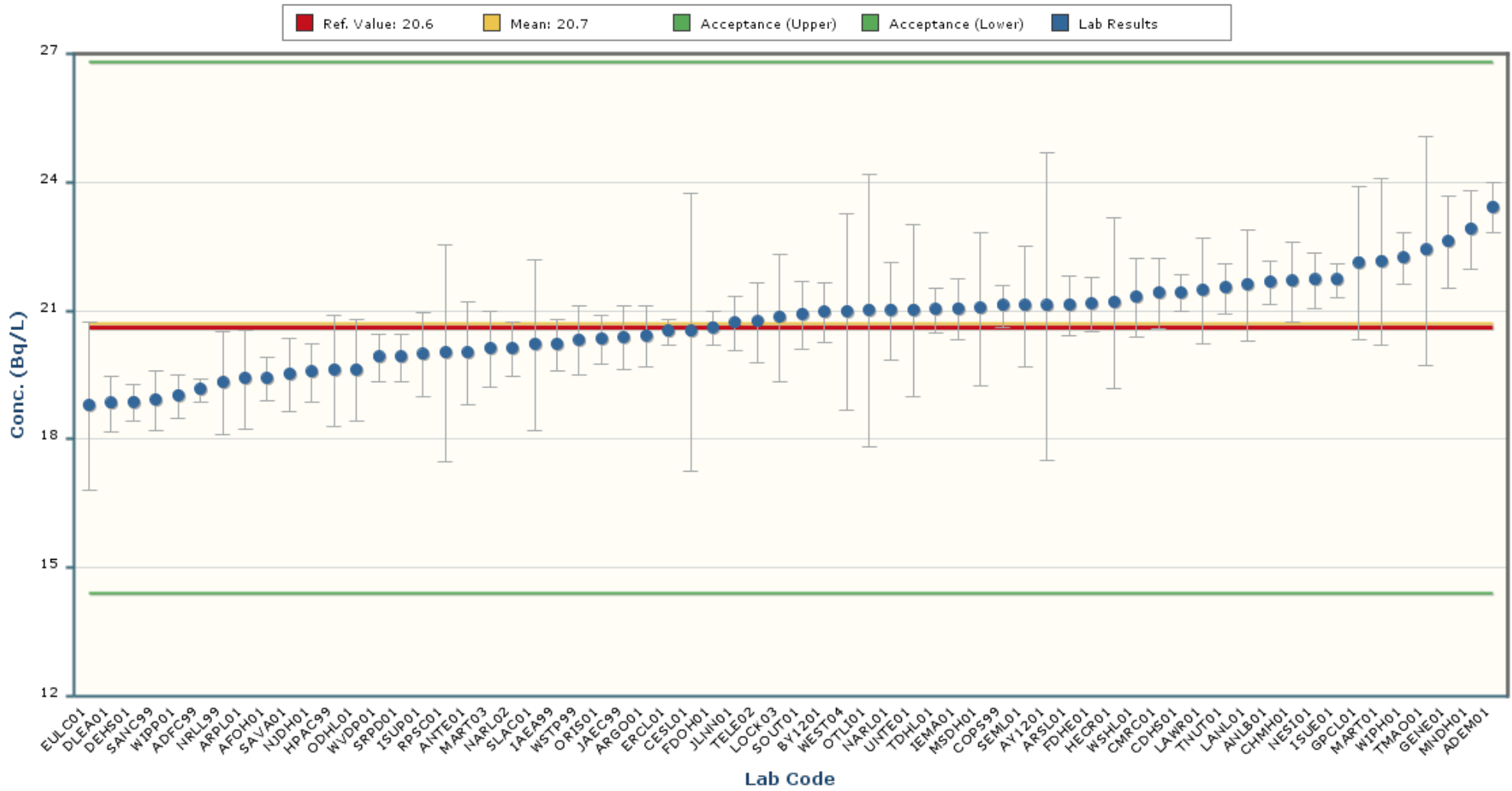
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 5.2 and 24.8 ( $\pm 5$  Standard Deviations).

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

# Manganese-54

## MAPEP-19-MaW41



### Notes:

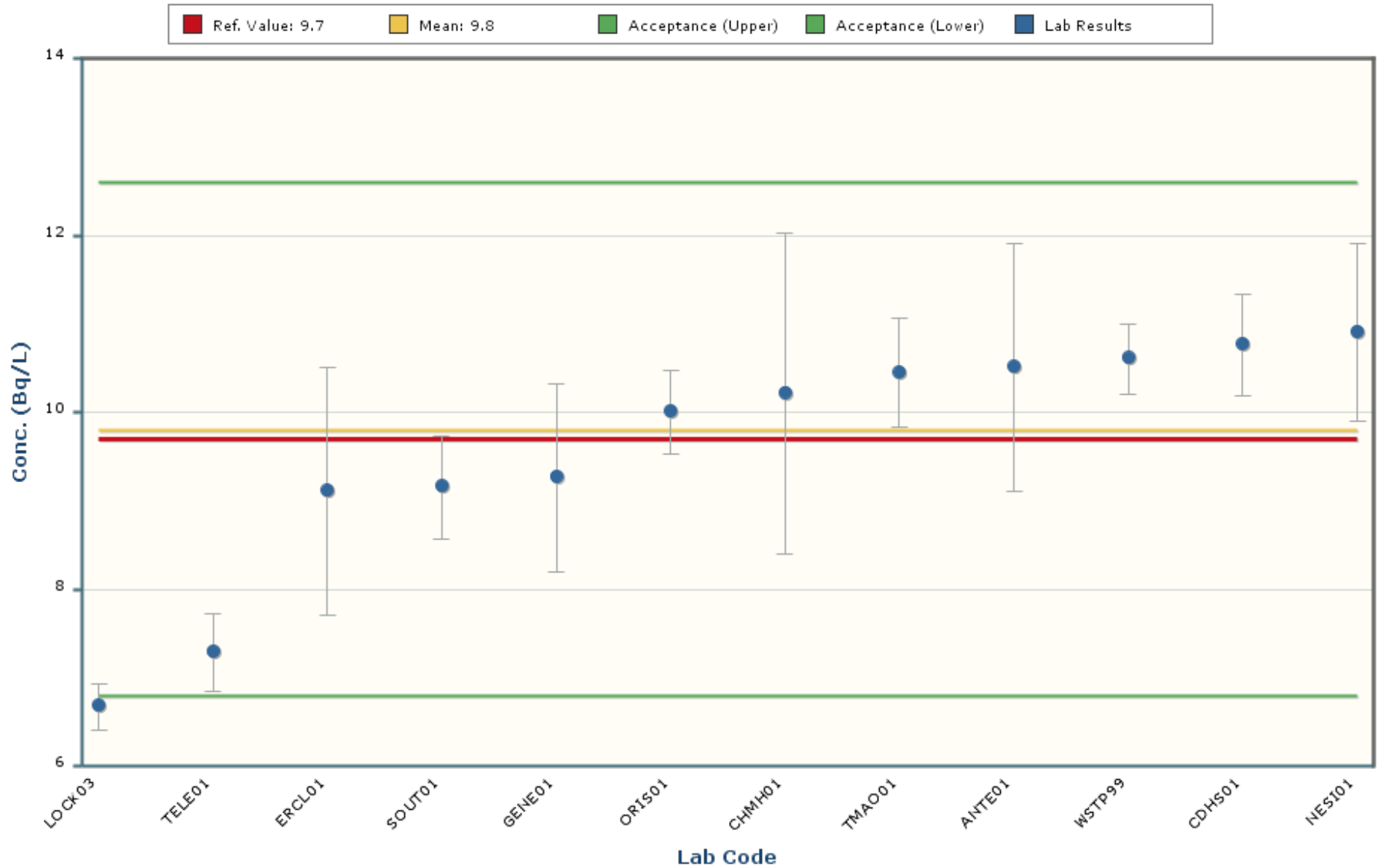
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 15.5 and 25.9 ( $\pm 5$  Standard Deviations).

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

# Nickel-63

## MAPEP-19-MaW41



### Notes:

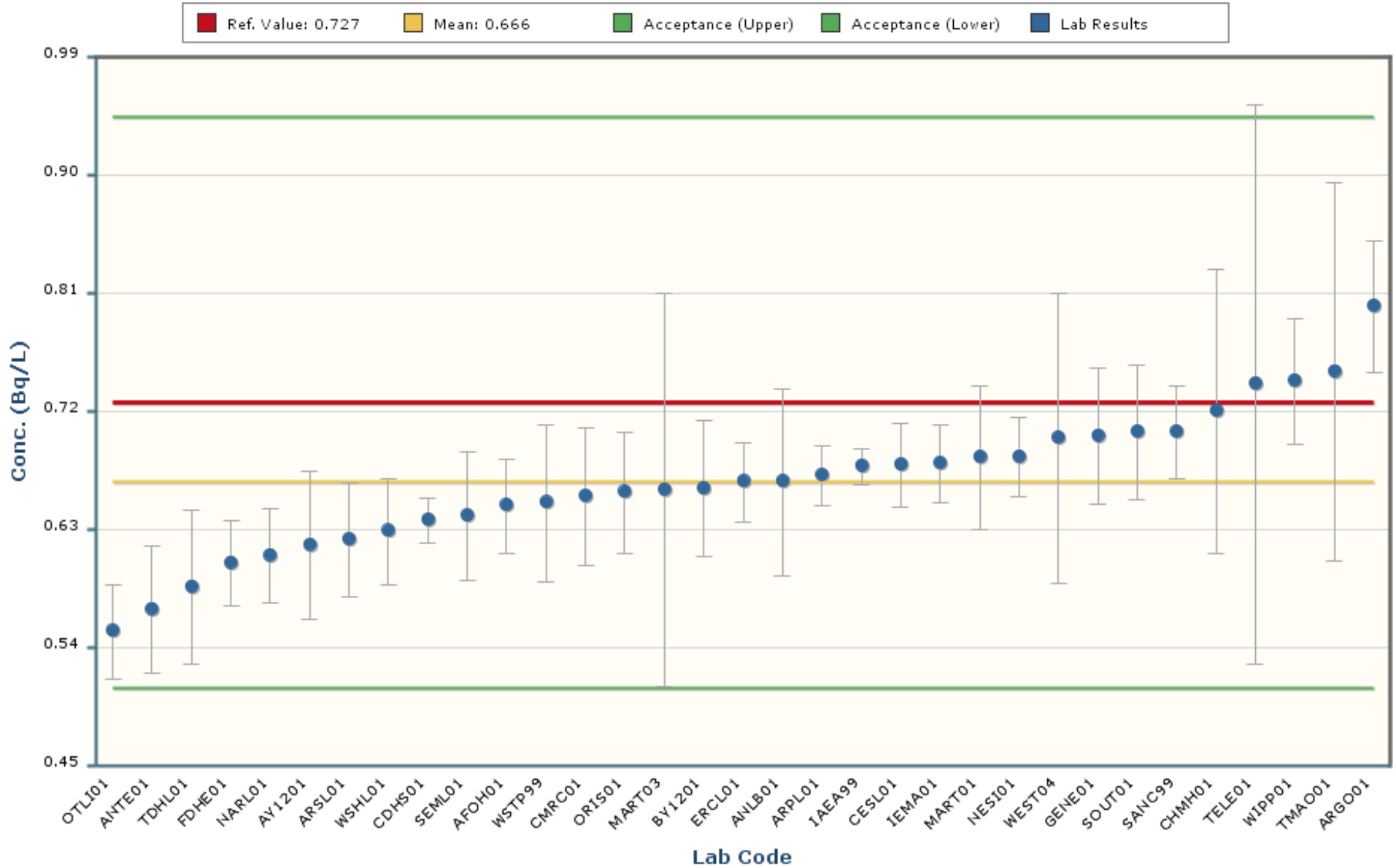
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 4.5 and 15.2 ( $\pm 5$  Standard Deviations).

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

# Plutonium-239/240

## MAPEP-19-MaW41



### Notes:

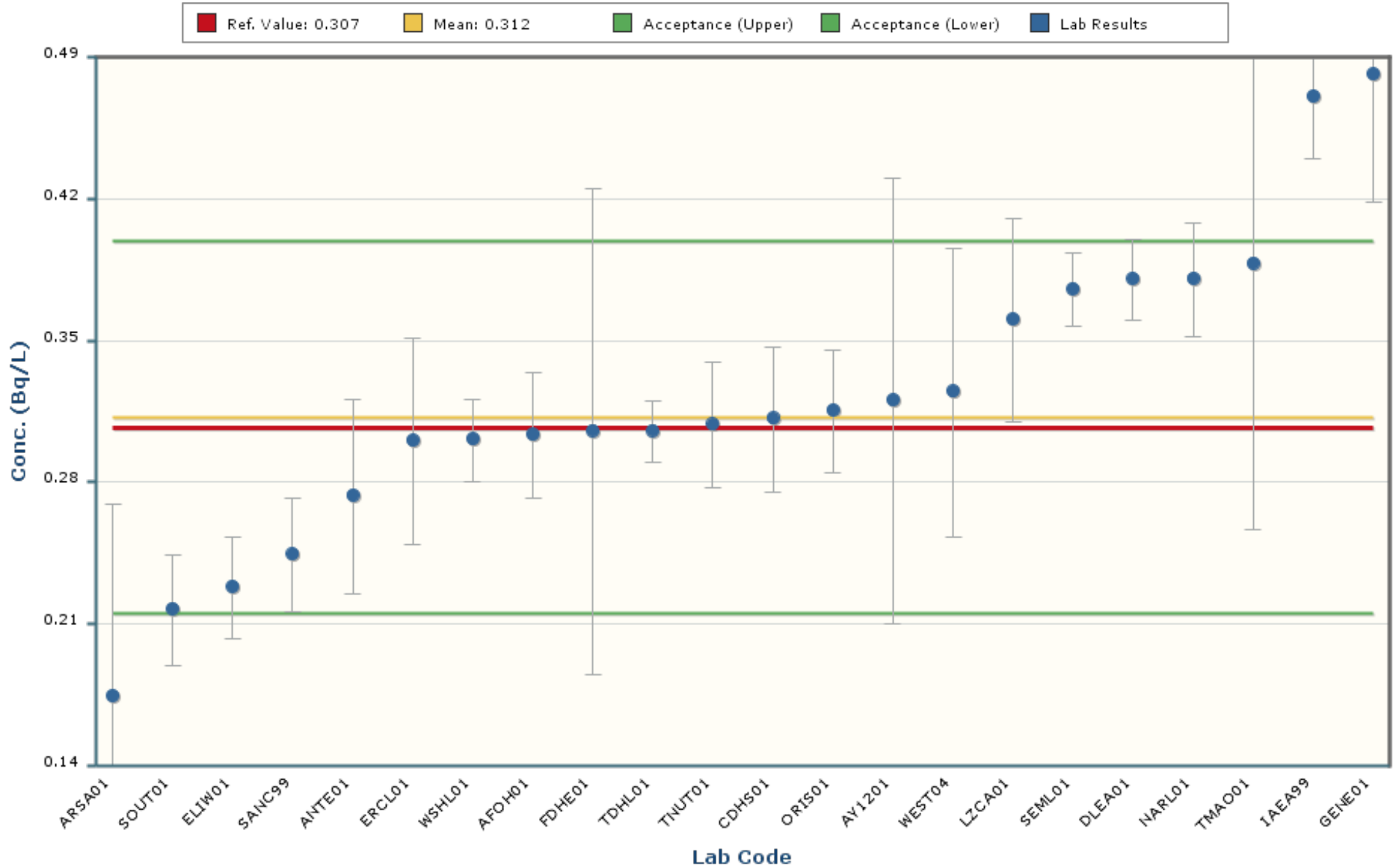
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 0.401 and 0.930 ( $\pm 5$  Standard Deviations).

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

# Radium-226

## MAPEP-19-MaW41



### Notes:

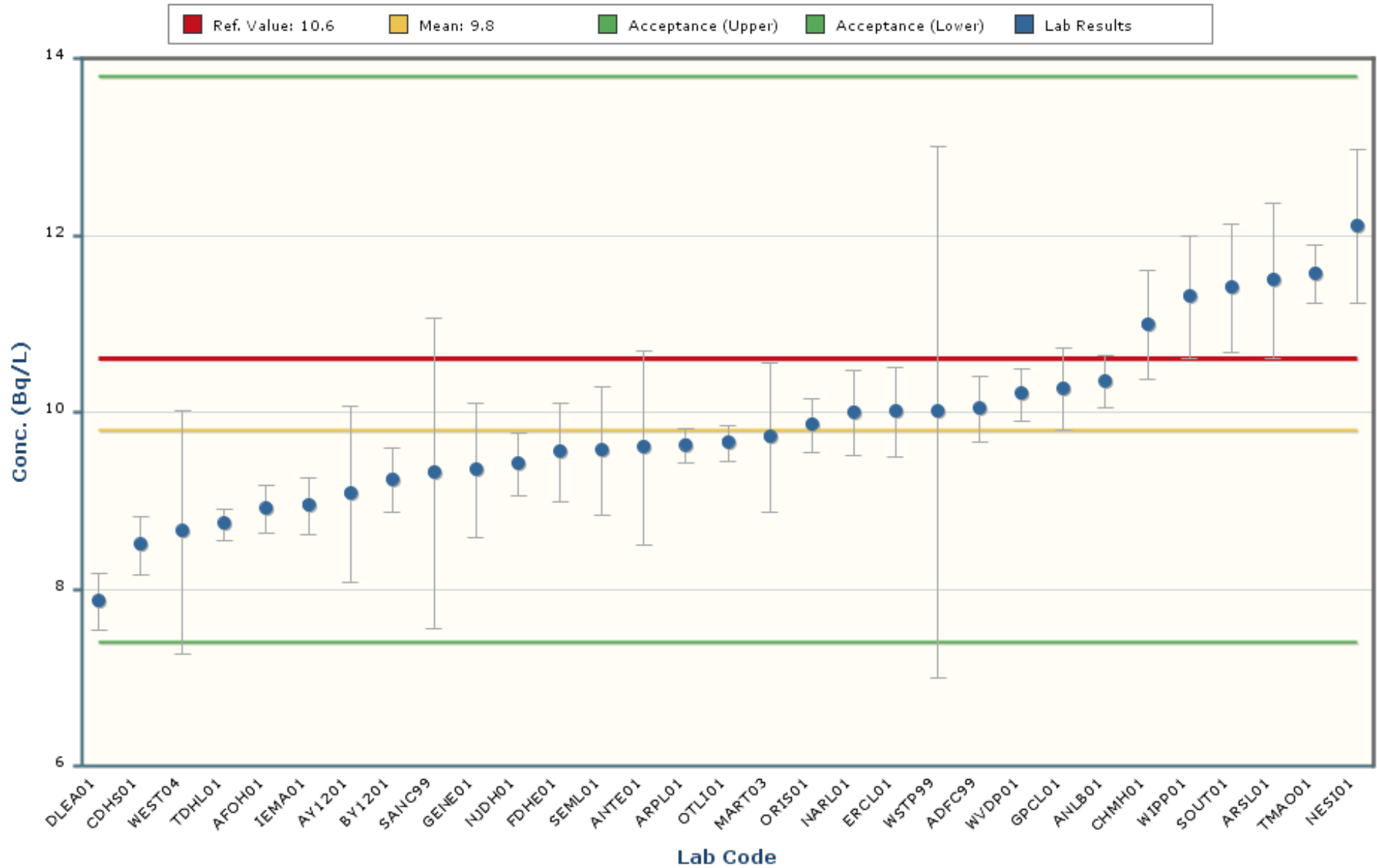
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 0.065 and 0.560 ( $\pm 5$  Standard Deviations).

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

# Strontium-90

## MAPEP-19-MaW41



### Notes:

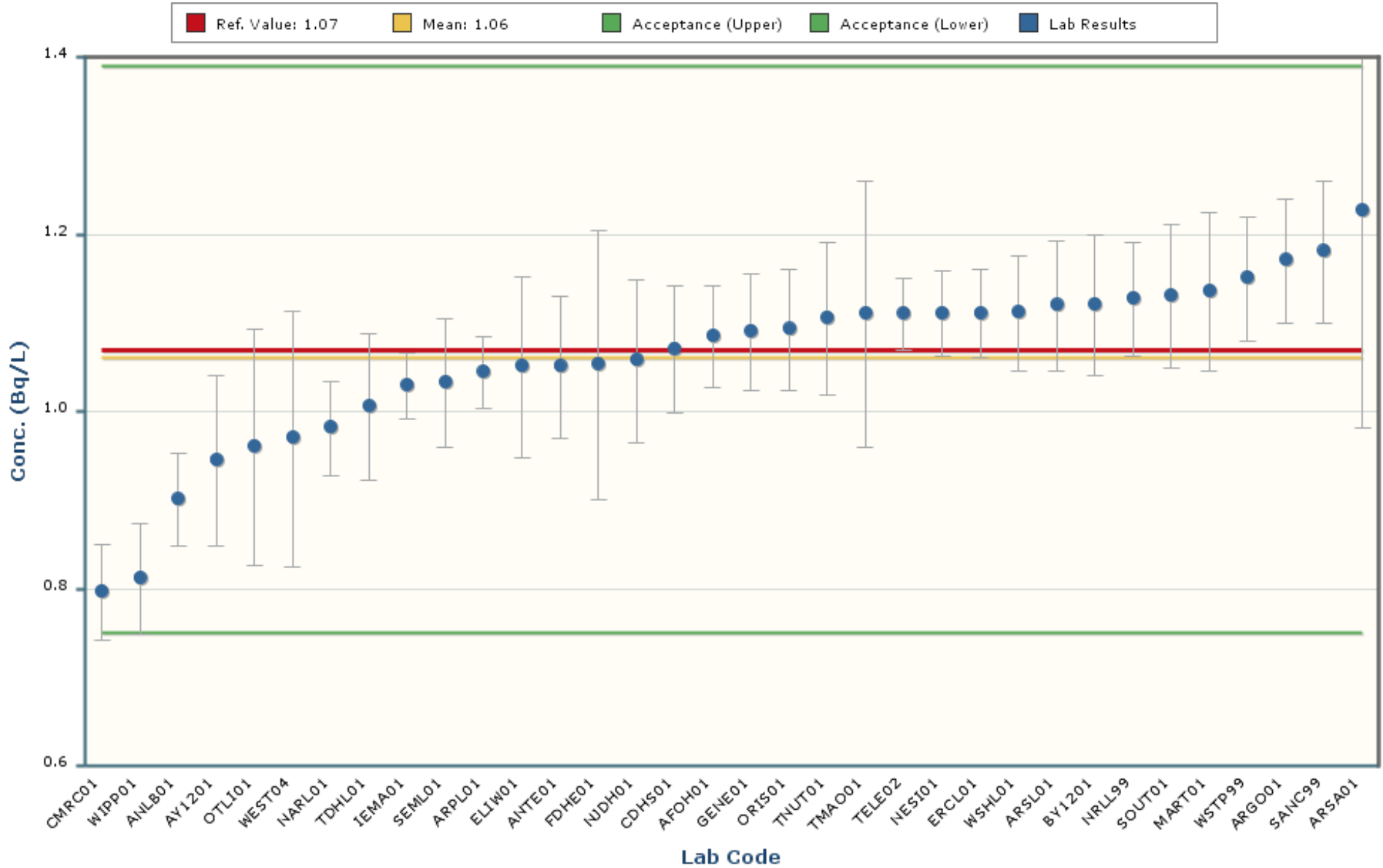
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 4.9 and 14.8 ( $\pm 5$  Standard Deviations).

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

# Uranium-234

## MAPEP-19-MaW41



### Notes:

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

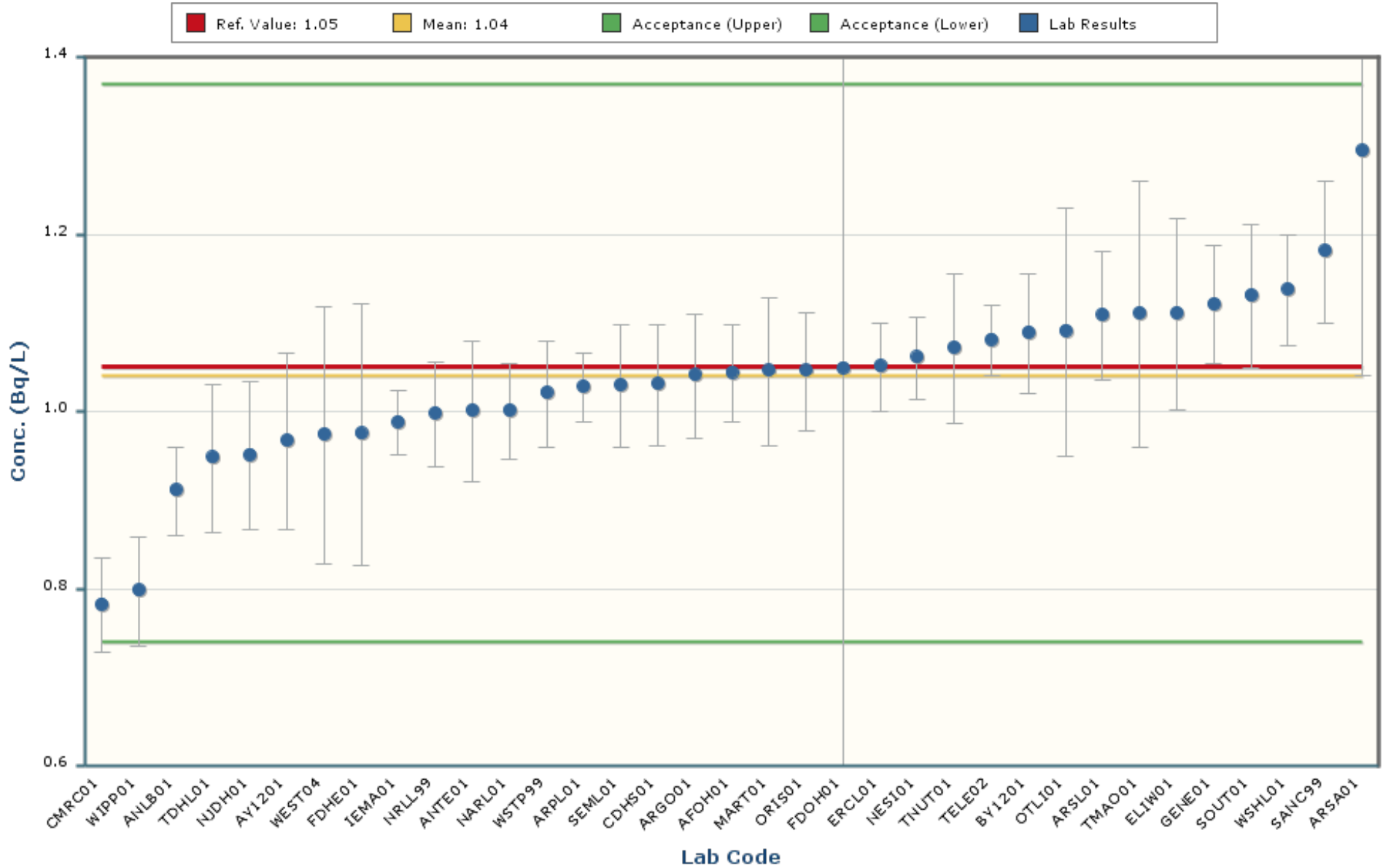
The chart shows only data points with values between 0.58 and 1.54 ( $\pm 5$  Standard Deviations).

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



# Uranium-238

## MAPEP-19-MaW41



### Notes:

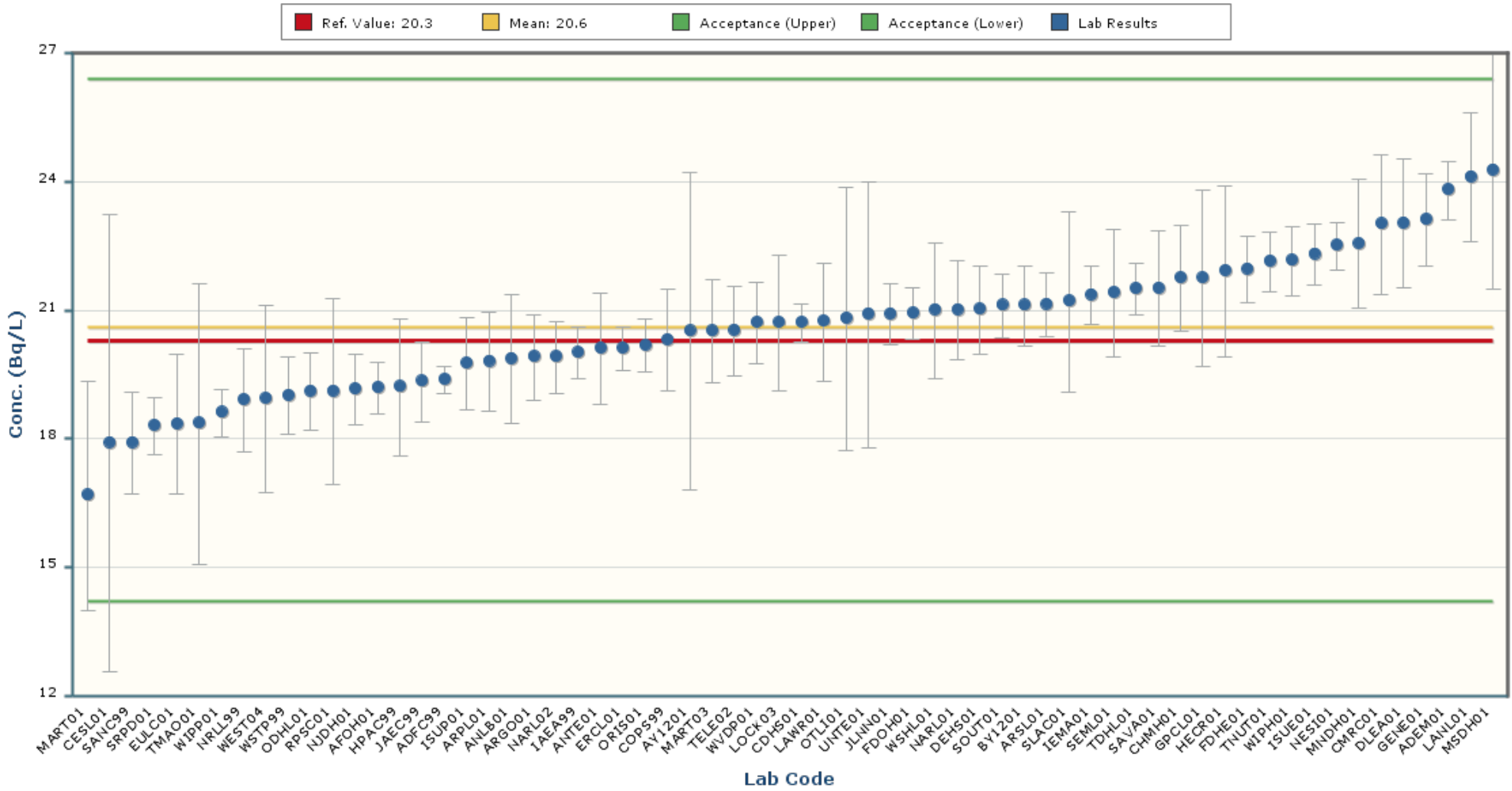
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 0.56 and 1.51 ( $\pm 5$  Standard Deviations).

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

# Zinc-65

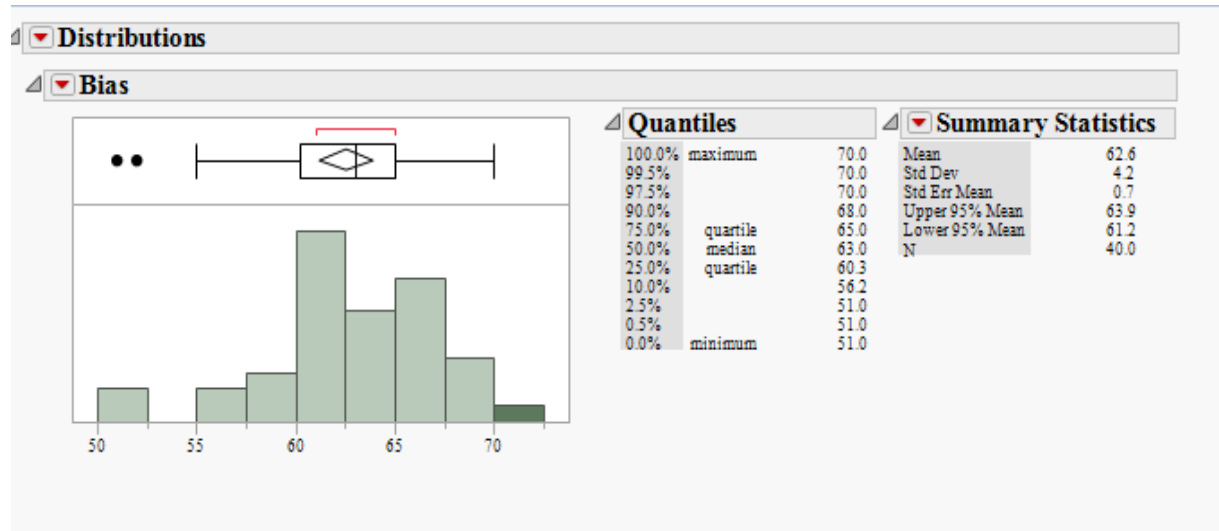
## MAPEP-19-MaW41



### Notes:

- The chart mean excludes values outside of a bias range of  $\pm 30\%$ .
- The chart shows only data points with values between 12.8 and 28.5 ( $\pm 5$  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.

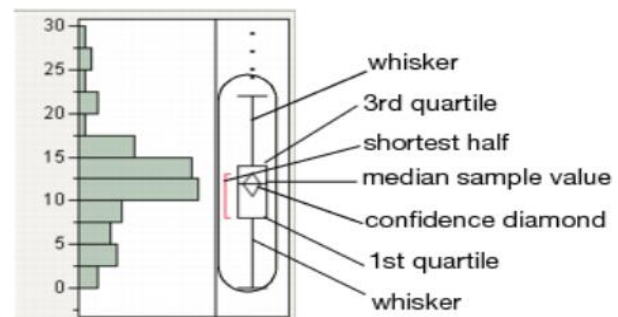


### Outlier Box Plot

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)

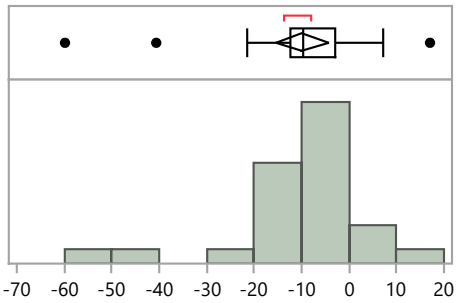


If the data points do not reach the computed ranges, then the whiskers are determined by the upper and lower data point values (not including outliers). The bracket outside of the box identifies the *shortest half*, which is the most dense 50% of the observations (Rousseuw and Leroy 1987).

**MaW Distribution by Detection Method**

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

**Bias**



**Quantiles**

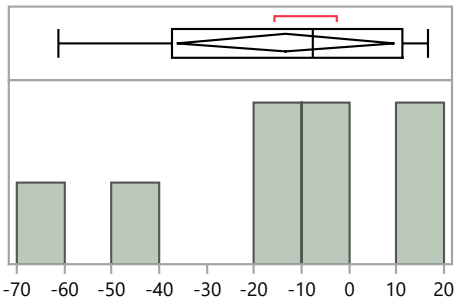
100.0%	maximum	17.0
99.5%		17.0
97.5%		17.0
90.0%		7.1
75.0%	quartile	-3.1
50.0%	median	-9.7
25.0%	quartile	-12.4
10.0%		-23.4
2.5%		-59.8
0.5%		-59.8
0.0%	minimum	-59.8

**Summary Statistics**

Mean	-9.9
Std Dev	14.1
Std Err Mean	2.7
Upper 95% Mean	-4.4
Lower 95% Mean	-15.4
N	28.0

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

**Bias**



**Quantiles**

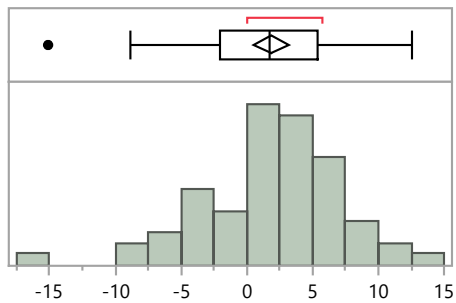
100.0%	maximum	16.7
99.5%		16.7
97.5%		16.7
90.0%		16.7
75.0%	quartile	11.2
50.0%	median	-7.8
25.0%	quartile	-37.4
10.0%		-61.1
2.5%		-61.1
0.5%		-61.1
0.0%	minimum	-61.1

**Summary Statistics**

Mean	-13.4
Std Dev	27.3
Std Err Mean	9.6
Upper 95% Mean	9.4
Lower 95% Mean	-36.2
N	8.0

**Distributions Analyte\_Detection=Cesium-137 Gamma Spectrometry**

**Bias**



**Quantiles**

100.0%	maximum	12.5
99.5%		12.5
97.5%		11.8
90.0%		8.3
75.0%	quartile	5.4
50.0%	median	1.8
25.0%	quartile	-2.0
10.0%		-5.0
2.5%		-11.2
0.5%		-15.1
0.0%	minimum	-15.1

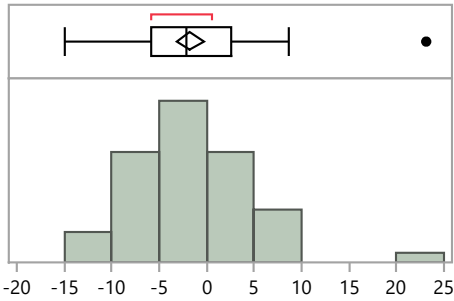
**Summary Statistics**

Mean	1.8
Std Dev	5.3
Std Err Mean	0.7
Upper 95% Mean	3.1
Lower 95% Mean	0.5
N	64.0

**MaW Distribution by Detection Method**

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

**Bias**



**Quantiles**

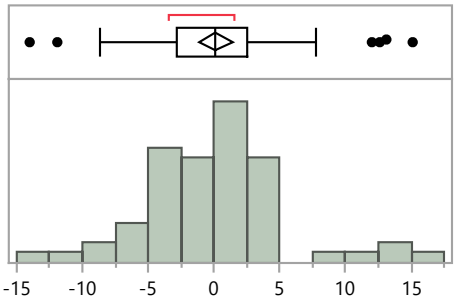
100.0%	maximum	23.1
99.5%		23.1
97.5%		14.1
90.0%		5.2
75.0%	quartile	2.6
50.0%	median	-2.2
25.0%	quartile	-5.8
10.0%		-8.3
2.5%		-14.0
0.5%		-14.9
0.0%	minimum	-14.9

**Summary Statistics**

Mean	-1.7
Std Dev	6.0
Std Err Mean	0.8
Upper 95% Mean	-0.2
Lower 95% Mean	-3.2
N	64.0

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

**Bias**



**Quantiles**

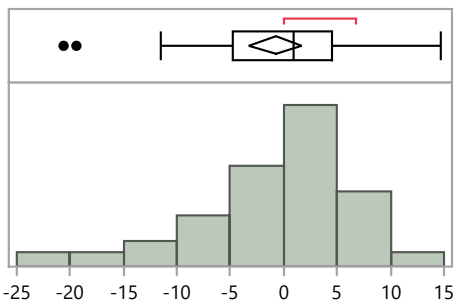
100.0%	maximum	15.1
99.5%		15.1
97.5%		13.9
90.0%		4.8
75.0%	quartile	2.6
50.0%	median	0.1
25.0%	quartile	-2.8
10.0%		-5.8
2.5%		-12.7
0.5%		-14.0
0.0%	minimum	-14.0

**Summary Statistics**

Mean	0.1
Std Dev	5.2
Std Err Mean	0.7
Upper 95% Mean	1.4
Lower 95% Mean	-1.2
N	64.0

**Distributions Analyte\_Detection=Hydrogen-3 Beta Counting - liquid scintillation counter**

**Bias**



**Quantiles**

100.0%	maximum	14.7
99.5%		14.7
97.5%		14.7
90.0%		6.5
75.0%	quartile	4.5
50.0%	median	0.9
25.0%	quartile	-4.8
10.0%		-11.4
2.5%		-20.6
0.5%		-20.6
0.0%	minimum	-20.6

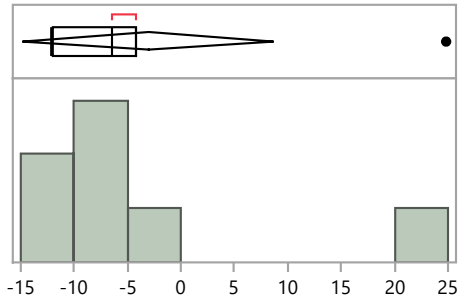
**Summary Statistics**

Mean	-0.8
Std Dev	7.3
Std Err Mean	1.2
Upper 95% Mean	1.7
Lower 95% Mean	-3.2
N	36.0

**MaW Distribution by Detection Method**

**Distributions Analyte\_Detection=Iron-55 Beta Counting - liquid scintillation counter**

**Bias**



**Quantiles**

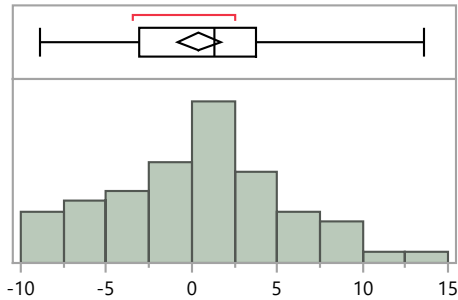
100.0%	maximum	24.8
99.5%		24.8
97.5%		24.8
90.0%		24.8
75.0%	quartile	-4.2
50.0%	median	-6.4
25.0%	quartile	-12.0
10.0%		-12.1
2.5%		-12.1
0.5%		-12.1
0.0%	minimum	-12.1

**Summary Statistics**

Mean	-3.1
Std Dev	12.7
Std Err Mean	4.8
Upper 95% Mean	8.7
Lower 95% Mean	-14.8
N	7.0

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

**Bias**



**Quantiles**

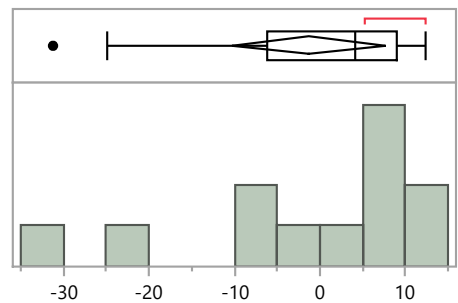
100.0%	maximum	13.6
99.5%		13.6
97.5%		12.0
90.0%		7.4
75.0%	quartile	3.8
50.0%	median	1.3
25.0%	quartile	-3.1
10.0%		-6.7
2.5%		-8.7
0.5%		-8.9
0.0%	minimum	-8.9

**Summary Statistics**

Mean	0.4
Std Dev	5.1
Std Err Mean	0.6
Upper 95% Mean	1.7
Lower 95% Mean	-0.8
N	64.0

**Distributions Analyte\_Detection=Nickel-63 Beta Counting - liquid scintillation counter**

**Bias**



**Quantiles**

100.0%	maximum	12.4
99.5%		12.4
97.5%		12.4
90.0%		12.0
75.0%	quartile	9.0
50.0%	median	4.2
25.0%	quartile	-6.1
10.0%		-29.3
2.5%		-31.2
0.5%		-31.2
0.0%	minimum	-31.2

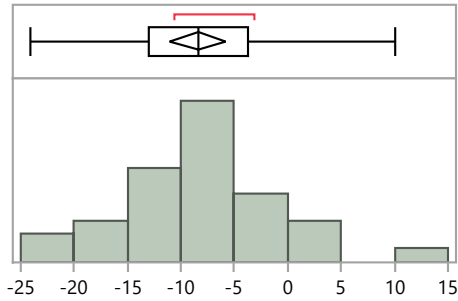
**Summary Statistics**

Mean	-1.3
Std Dev	14.1
Std Err Mean	4.1
Upper 95% Mean	7.6
Lower 95% Mean	-10.3
N	12.0

**MaW Distribution by Detection Method**

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

**Bias**



**Quantiles**

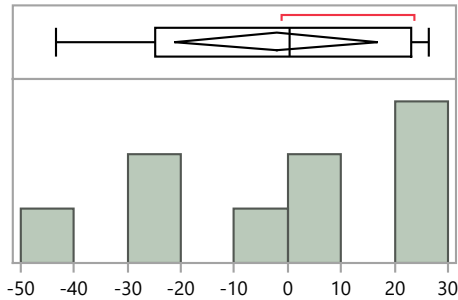
100.0%	maximum	10.0
99.5%		10.0
97.5%		10.0
90.0%		2.1
75.0%	quartile	-3.7
50.0%	median	-8.4
25.0%	quartile	-13.0
10.0%		-18.4
2.5%		-24.1
0.5%		-24.1
0.0%	minimum	-24.1

**Summary Statistics**

Mean	-8.4
Std Dev	7.3
Std Err Mean	1.3
Upper 95% Mean	-5.8
Lower 95% Mean	-11.0
N	33.0

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

**Bias**



**Quantiles**

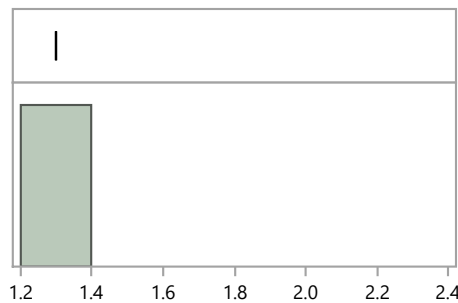
100.0%	maximum	26.3
99.5%		26.3
97.5%		26.3
90.0%		26.3
75.0%	quartile	23.0
50.0%	median	0.3
25.0%	quartile	-24.9
10.0%		-43.3
2.5%		-43.3
0.5%		-43.3
0.0%	minimum	-43.3

**Summary Statistics**

Mean	-2.1
Std Dev	24.7
Std Err Mean	8.2
Upper 95% Mean	16.8
Lower 95% Mean	-21.1
N	9.0

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

**Bias**



**Quantiles**

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

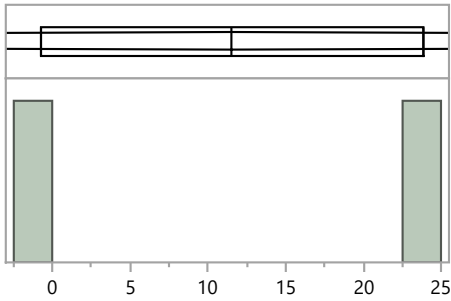
**Summary Statistics**

Mean	1.3
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

**MaW Distribution by Detection Method**

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

**Bias**



**Quantiles**

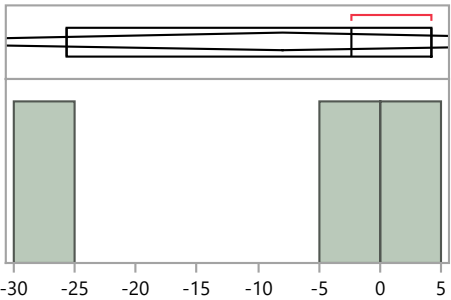
100.0%	maximum	23.8
99.5%		23.8
97.5%		23.8
90.0%		23.8
75.0%	quartile	23.8
50.0%	median	11.6
25.0%	quartile	-0.7
10.0%		-0.7
2.5%		-0.7
0.5%		-0.7
0.0%	minimum	-0.7

**Summary Statistics**

Mean	11.6
Std Dev	17.3
Std Err Mean	12.3
Upper 95% Mean	167.2
Lower 95% Mean	-144.1
N	2.0

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

**Bias**



**Quantiles**

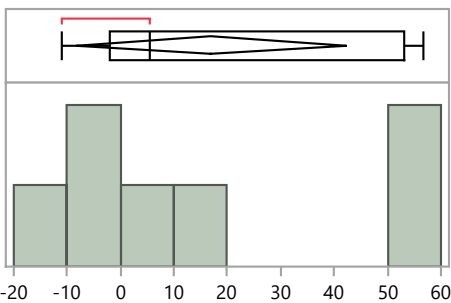
100.0%	maximum	4.2
99.5%		4.2
97.5%		4.2
90.0%		4.2
75.0%	quartile	4.2
50.0%	median	-2.3
25.0%	quartile	-25.7
10.0%		-25.7
2.5%		-25.7
0.5%		-25.7
0.0%	minimum	-25.7

**Summary Statistics**

Mean	-7.9
Std Dev	15.7
Std Err Mean	9.1
Upper 95% Mean	31.1
Lower 95% Mean	-47.0
N	3.0

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

**Bias**



**Quantiles**

100.0%	maximum	56.7
99.5%		56.7
97.5%		56.7
90.0%		56.7
75.0%	quartile	53.1
50.0%	median	5.6
25.0%	quartile	-2.0
10.0%		-11.1
2.5%		-11.1
0.5%		-11.1
0.0%	minimum	-11.1

**Summary Statistics**

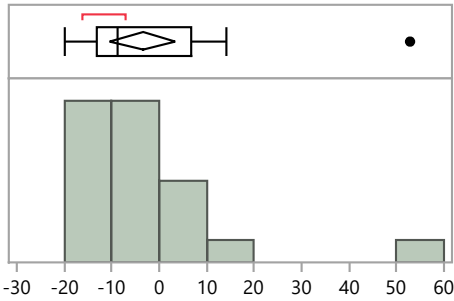
Mean	17.0
Std Dev	27.3
Std Err Mean	10.3
Upper 95% Mean	42.2
Lower 95% Mean	-8.3
N	7.0



**MaW Distribution by Detection Method**

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

**Bias**



**Quantiles**

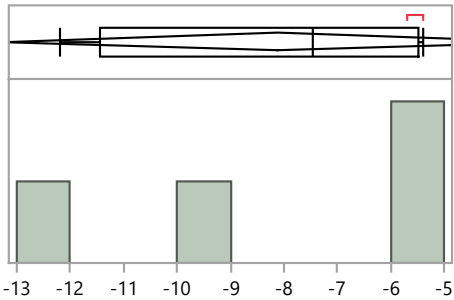
100.0%	maximum	52.8
99.5%		52.8
97.5%		52.8
90.0%		12.7
75.0%	quartile	6.8
50.0%	median	-8.7
25.0%	quartile	-13.3
10.0%		-17.1
2.5%		-19.9
0.5%		-19.9
0.0%	minimum	-19.9

**Summary Statistics**

Mean	-3.5
Std Dev	15.8
Std Err Mean	3.4
Upper 95% Mean	3.5
Lower 95% Mean	-10.5
N	22.0

**Distributions Analyte\_Detection=Strontium-90 Beta Counting - liquid scintillation counter**

**Bias**



**Quantiles**

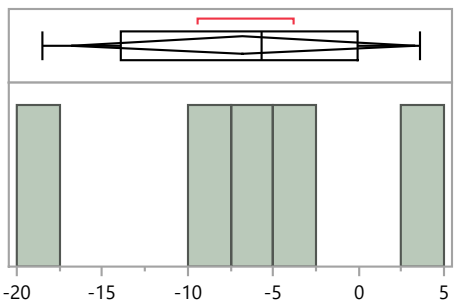
100.0%	maximum	-5.4
99.5%		-5.4
97.5%		-5.4
90.0%		-5.4
75.0%	quartile	-5.5
50.0%	median	-7.5
25.0%	quartile	-11.5
10.0%		-12.2
2.5%		-12.2
0.5%		-12.2
0.0%	minimum	-12.2

**Summary Statistics**

Mean	-8.1
Std Dev	3.2
Std Err Mean	1.6
Upper 95% Mean	-3.0
Lower 95% Mean	-13.2
N	4.0

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

**Bias**



**Quantiles**

100.0%	maximum	3.6
99.5%		3.6
97.5%		3.6
90.0%		3.6
75.0%	quartile	-0.1
50.0%	median	-5.7
25.0%	quartile	-14.0
10.0%		-18.5
2.5%		-18.5
0.5%		-18.5
0.0%	minimum	-18.5

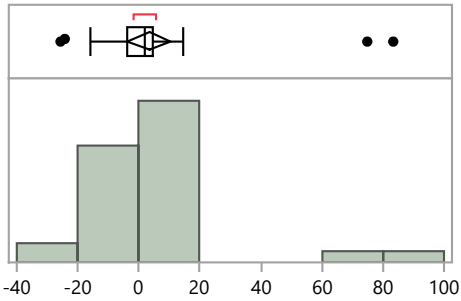
**Summary Statistics**

Mean	-6.8
Std Dev	8.1
Std Err Mean	3.6
Upper 95% Mean	3.3
Lower 95% Mean	-16.8
N	5.0

**MaW Distribution by Detection Method**

**Distributions Analyte\_Detection=Uranium-234 Alpha Spectrometry**

Bias



**Quantiles**

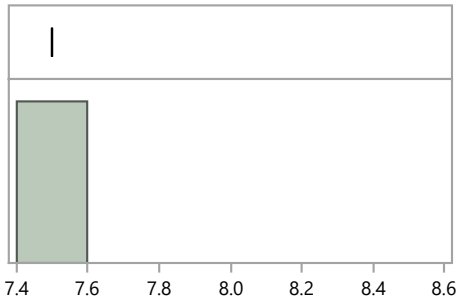
100.0%	maximum	83.3
99.5%		83.3
97.5%		83.3
90.0%		12.0
75.0%	quartile	4.7
50.0%	median	1.9
25.0%	quartile	-3.8
10.0%		-13.4
2.5%		-25.6
0.5%		-25.6
0.0%	minimum	-25.6

**Summary Statistics**

Mean	3.4
Std Dev	20.8
Std Err Mean	3.5
Upper 95% Mean	10.5
Lower 95% Mean	-3.8
N	35.0

**Distributions Analyte\_Detection=Uranium-234 Inductively Coupled Plasma Mass Spectrometry**

Bias



**Quantiles**

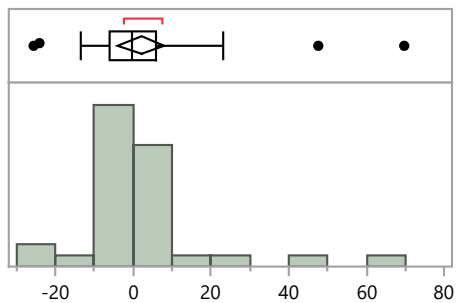
100.0%	maximum	7.5
99.5%		7.5
97.5%		7.5
90.0%		7.5
75.0%	quartile	7.5
50.0%	median	7.5
25.0%	quartile	7.5
10.0%		7.5
2.5%		7.5
0.5%		7.5
0.0%	minimum	7.5

**Summary Statistics**

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

**Distributions Analyte\_Detection=Uranium-238 Alpha Spectrometry**

Bias



**Quantiles**

100.0%	maximum	69.7
99.5%		69.7
97.5%		69.7
90.0%		16.7
75.0%	quartile	5.7
50.0%	median	-0.5
25.0%	quartile	-6.0
10.0%		-11.2
2.5%		-25.6
0.5%		-25.6
0.0%	minimum	-25.6

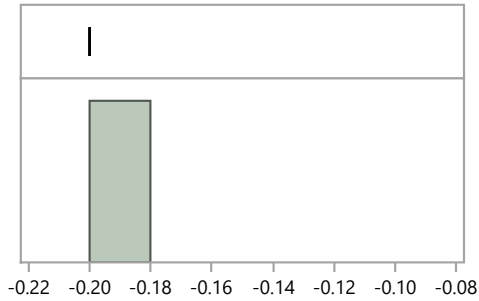
**Summary Statistics**

Mean	2.0
Std Dev	17.0
Std Err Mean	2.9
Upper 95% Mean	7.9
Lower 95% Mean	-3.8
N	35.0

**MaW Distribution by Detection Method**

**Distributions Analyte\_Detection=Uranium-238 Gamma Spectrometry**

**Bias**



**Quantiles**

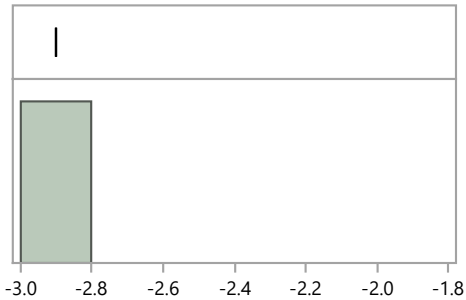
100.0%	maximum	-0.2
99.5%		-0.2
97.5%		-0.2
90.0%		-0.2
75.0%	quartile	-0.2
50.0%	median	-0.2
25.0%	quartile	-0.2
10.0%		-0.2
2.5%		-0.2
0.5%		-0.2
0.0%	minimum	-0.2

**Summary Statistics**

Mean	-0.2
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

**Distributions Analyte\_Detection=Uranium-238 Inductively Coupled Plasma Mass Spectrometry**

**Bias**



**Quantiles**

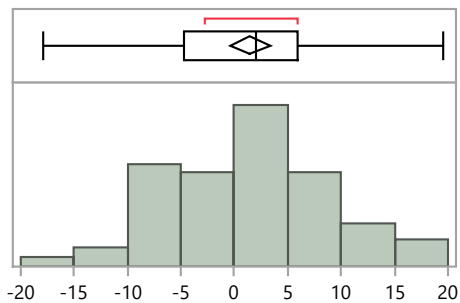
100.0%	maximum	-2.9
99.5%		-2.9
97.5%		-2.9
90.0%		-2.9
75.0%	quartile	-2.9
50.0%	median	-2.9
25.0%	quartile	-2.9
10.0%		-2.9
2.5%		-2.9
0.5%		-2.9
0.0%	minimum	-2.9

**Summary Statistics**

Mean	-2.9
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

**Distributions Analyte\_Detection=Zinc-65 Gamma Spectrometry**

**Bias**



**Quantiles**

100.0%	maximum	19.5
99.5%		19.5
97.5%		19.0
90.0%		12.2
75.0%	quartile	5.9
50.0%	median	2.0
25.0%	quartile	-4.8
10.0%		-9.0
2.5%		-14.1
0.5%		-17.9
0.0%	minimum	-17.9

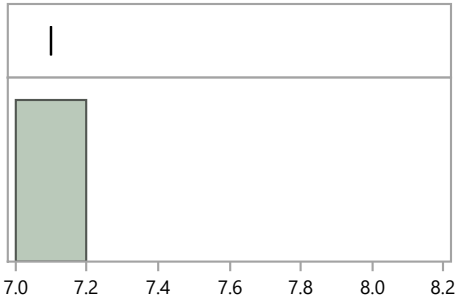
**Summary Statistics**

Mean	1.5
Std Dev	7.7
Std Err Mean	1.0
Upper 95% Mean	3.4
Lower 95% Mean	-0.4
N	64.0

**MaW Distribution by Prep Method**

**Distributions Analyte\_Method=Americium-241 Acid dissolution by strong Aqua Regia, hydrofluoric acid, etc.**

**Bias**



**Quantiles**

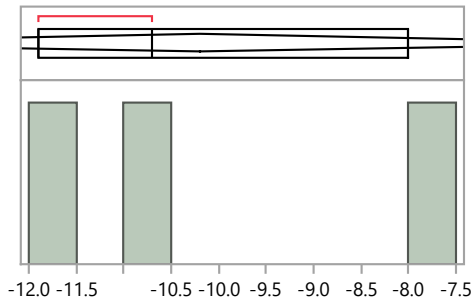
100.0%	maximum	7.1
99.5%		7.1
97.5%		7.1
90.0%		7.1
75.0%	quartile	7.1
50.0%	median	7.1
25.0%	quartile	7.1
10.0%		7.1
2.5%		7.1
0.5%		7.1
0.0%	minimum	7.1

**Summary Statistics**

Mean	7.1
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

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

**Bias**



**Quantiles**

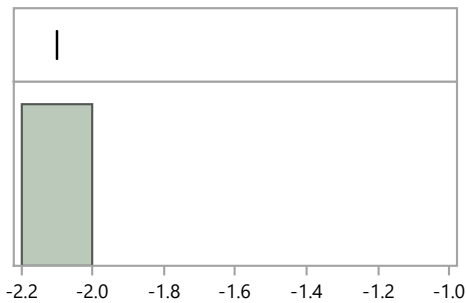
100.0%	maximum	-8.0
99.5%		-8.0
97.5%		-8.0
90.0%		-8.0
75.0%	quartile	-8.0
50.0%	median	-10.7
25.0%	quartile	-11.9
10.0%		-11.9
2.5%		-11.9
0.5%		-11.9
0.0%	minimum	-11.9

**Summary Statistics**

Mean	-10.2
Std Dev	2.0
Std Err Mean	1.2
Upper 95% Mean	-5.2
Lower 95% Mean	-15.2
N	3.0

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

**Bias**



**Quantiles**

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

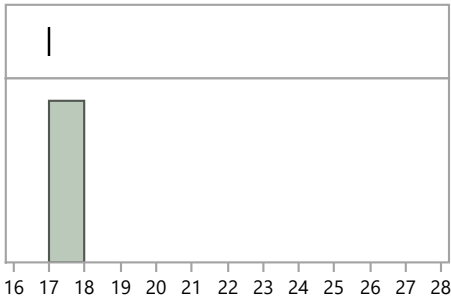
**Summary Statistics**

Mean	-2.1
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

**MaW Distribution by Prep Method**

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

**Bias**



**Quantiles**

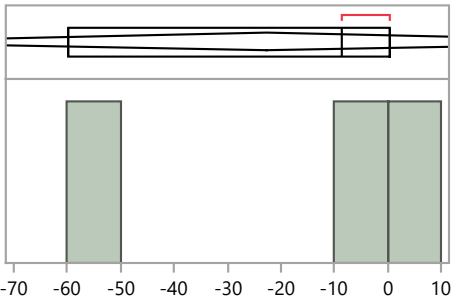
100.0%	maximum	17.0
99.5%		17.0
97.5%		17.0
90.0%		17.0
75.0%	quartile	17.0
50.0%	median	17.0
25.0%	quartile	17.0
10.0%		17.0
2.5%		17.0
0.5%		17.0
0.0%	minimum	17.0

**Summary Statistics**

Mean	17.0
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

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

**Bias**



**Quantiles**

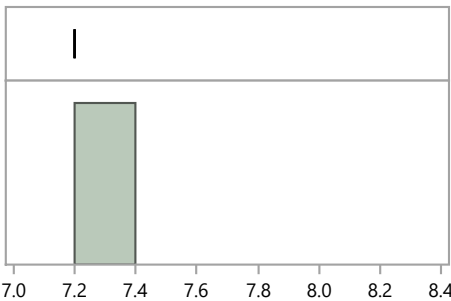
100.0%	maximum	0.4
99.5%		0.4
97.5%		0.4
90.0%		0.4
75.0%	quartile	0.4
50.0%	median	-8.6
25.0%	quartile	-59.8
10.0%		-59.8
2.5%		-59.8
0.5%		-59.8
0.0%	minimum	-59.8

**Summary Statistics**

Mean	-22.7
Std Dev	32.5
Std Err Mean	18.7
Upper 95% Mean	58.0
Lower 95% Mean	-103.3
N	3.0

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

**Bias**



**Quantiles**

100.0%	maximum	7.2
99.5%		7.2
97.5%		7.2
90.0%		7.2
75.0%	quartile	7.2
50.0%	median	7.2
25.0%	quartile	7.2
10.0%		7.2
2.5%		7.2
0.5%		7.2
0.0%	minimum	7.2

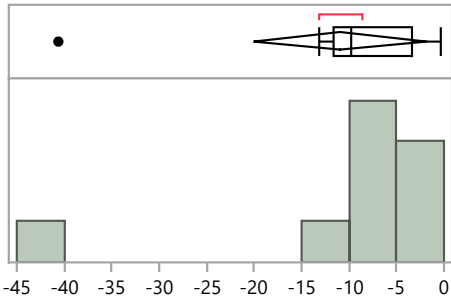
**Summary Statistics**

Mean	7.2
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

**MaW Distribution by Prep Method**

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

**Bias**



**Quantiles**

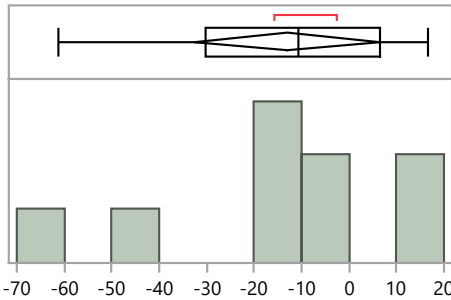
100.0%	maximum	-0.4
99.5%		-0.4
97.5%		-0.4
90.0%		-0.4
75.0%	quartile	-3.5
50.0%	median	-9.8
25.0%	quartile	-11.6
10.0%		-40.6
2.5%		-40.6
0.5%		-40.6
0.0%	minimum	-40.6

**Summary Statistics**

Mean	-11.0
Std Dev	11.8
Std Err Mean	3.9
Upper 95% Mean	-1.9
Lower 95% Mean	-20.1
N	9.0

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

**Bias**



**Quantiles**

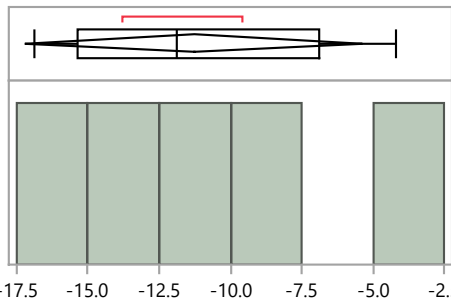
100.0%	maximum	16.7
99.5%		16.7
97.5%		16.7
90.0%		16.7
75.0%	quartile	6.6
50.0%	median	-10.7
25.0%	quartile	-30.2
10.0%		-61.1
2.5%		-61.1
0.5%		-61.1
0.0%	minimum	-61.1

**Summary Statistics**

Mean	-13.1
Std Dev	25.5
Std Err Mean	8.5
Upper 95% Mean	6.6
Lower 95% Mean	-32.7
N	9.0

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

**Bias**



**Quantiles**

100.0%	maximum	-4.2
99.5%		-4.2
97.5%		-4.2
90.0%		-4.2
75.0%	quartile	-6.9
50.0%	median	-11.9
25.0%	quartile	-15.4
10.0%		-16.9
2.5%		-16.9
0.5%		-16.9
0.0%	minimum	-16.9

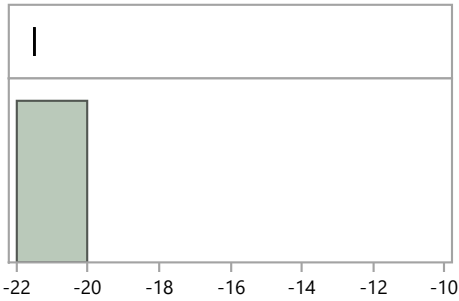
**Summary Statistics**

Mean	-11.3
Std Dev	4.8
Std Err Mean	2.1
Upper 95% Mean	-5.3
Lower 95% Mean	-17.2
N	5.0

**MaW Distribution by Prep Method**

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

Bias



**Quantiles**

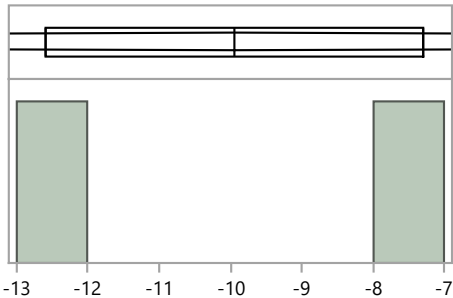
100.0%	maximum	-21.5
99.5%		-21.5
97.5%		-21.5
90.0%		-21.5
75.0%	quartile	-21.5
50.0%	median	-21.5
25.0%	quartile	-21.5
10.0%		-21.5
2.5%		-21.5
0.5%		-21.5
0.0%	minimum	-21.5

**Summary Statistics**

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

**Distributions Analyte\_Method=Americium-241 Wet ash - Acid digestion - the use of oxidizers to destroy organics**

Bias



**Quantiles**

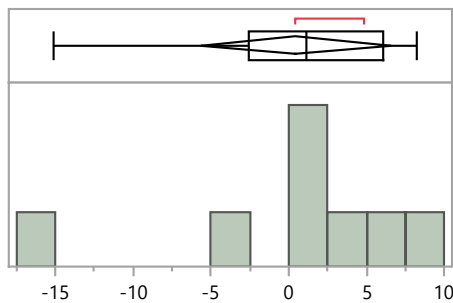
100.0%	maximum	-7.3
99.5%		-7.3
97.5%		-7.3
90.0%		-7.3
75.0%	quartile	-7.3
50.0%	median	-10.0
25.0%	quartile	-12.6
10.0%		-12.6
2.5%		-12.6
0.5%		-12.6
0.0%	minimum	-12.6

**Summary Statistics**

Mean	-10.0
Std Dev	3.7
Std Err Mean	2.6
Upper 95% Mean	23.7
Lower 95% Mean	-43.6
N	2.0

**Distributions Analyte\_Method=Cesium-137 EPA 901.1, Gamma Emitting, 600/4-80-032**

Bias



**Quantiles**

100.0%	maximum	8.2
99.5%		8.2
97.5%		8.2
90.0%		8.2
75.0%	quartile	6.1
50.0%	median	1.1
25.0%	quartile	-2.5
10.0%		-15.1
2.5%		-15.1
0.5%		-15.1
0.0%	minimum	-15.1

**Summary Statistics**

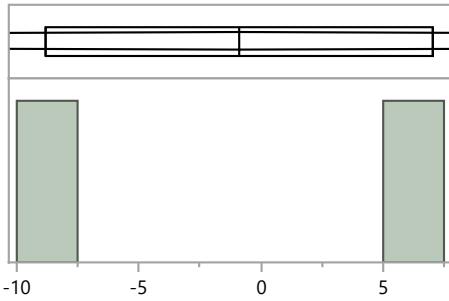
Mean	0.4
Std Dev	7.3
Std Err Mean	2.6
Upper 95% Mean	6.5
Lower 95% Mean	-5.7
N	8.0

MaW41 Distribution by Preparation Method

**MaW Distribution by Prep Method**

**Distributions Analyte\_Method=Cesium-137 Evaporation, straight**

**Bias**



**Quantiles**

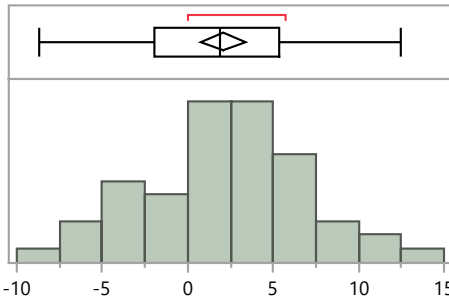
100.0%	maximum	7.0
99.5%		7.0
97.5%		7.0
90.0%		7.0
75.0%	quartile	7.0
50.0%	median	-0.9
25.0%	quartile	-8.8
10.0%		-8.8
2.5%		-8.8
0.5%		-8.8
0.0%	minimum	-8.8

**Summary Statistics**

Mean	-0.9
Std Dev	11.2
Std Err Mean	7.9
Upper 95% Mean	99.5
Lower 95% Mean	-101.3
N	2.0

**Distributions Analyte\_Method=Cesium-137 No preparation - analyzed as received**

**Bias**



**Quantiles**

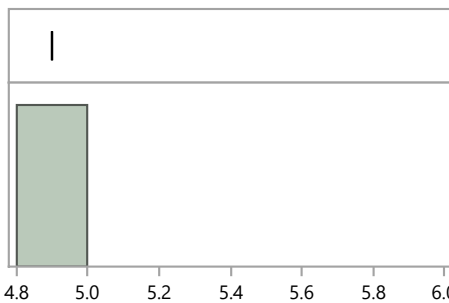
100.0%	maximum	12.5
99.5%		12.5
97.5%		12.1
90.0%		8.8
75.0%	quartile	5.4
50.0%	median	1.9
25.0%	quartile	-1.9
10.0%		-4.3
2.5%		-8.3
0.5%		-8.7
0.0%	minimum	-8.7

**Summary Statistics**

Mean	2.1
Std Dev	4.9
Std Err Mean	0.7
Upper 95% Mean	3.4
Lower 95% Mean	0.7
N	53.0

**Distributions Analyte\_Method=Cesium-137 Wet ash - Acid digestion - the use of oxidizers to destroy organics**

**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	4.9
25.0%	quartile	4.9
10.0%		4.9
2.5%		4.9
0.5%		4.9
0.0%	minimum	4.9

**Summary Statistics**

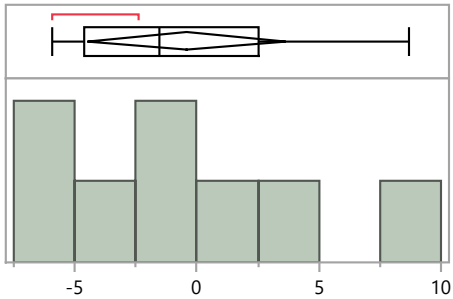
Mean	4.9
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0



**MaW Distribution by Prep Method**

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

**Bias**



**Quantiles**

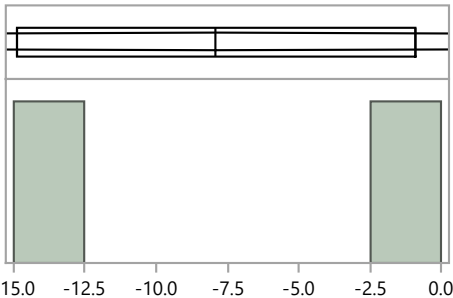
100.0%	maximum	8.7
99.5%		8.7
97.5%		8.7
90.0%		8.7
75.0%	quartile	2.6
50.0%	median	-1.5
25.0%	quartile	-4.6
10.0%		-5.9
2.5%		-5.9
0.5%		-5.9
0.0%	minimum	-5.9

**Summary Statistics**

Mean	-0.4
Std Dev	4.8
Std Err Mean	1.7
Upper 95% Mean	3.6
Lower 95% Mean	-4.5
N	8.0

**Distributions Analyte\_Method=Cobalt-57 Evaporation, straight**

**Bias**



**Quantiles**

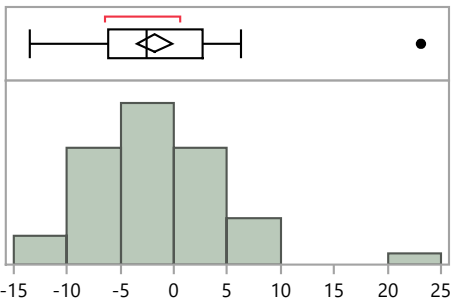
100.0%	maximum	-0.9
99.5%		-0.9
97.5%		-0.9
90.0%		-0.9
75.0%	quartile	-0.9
50.0%	median	-7.9
25.0%	quartile	-14.9
10.0%		-14.9
2.5%		-14.9
0.5%		-14.9
0.0%	minimum	-14.9

**Summary Statistics**

Mean	-7.9
Std Dev	9.9
Std Err Mean	7.0
Upper 95% Mean	81.0
Lower 95% Mean	-96.8
N	2.0

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

**Bias**



**Quantiles**

100.0%	maximum	23.1
99.5%		23.1
97.5%		17.2
90.0%		5.1
75.0%	quartile	2.7
50.0%	median	-2.6
25.0%	quartile	-6.1
10.0%		-8.3
2.5%		-12.8
0.5%		-13.5
0.0%	minimum	-13.5

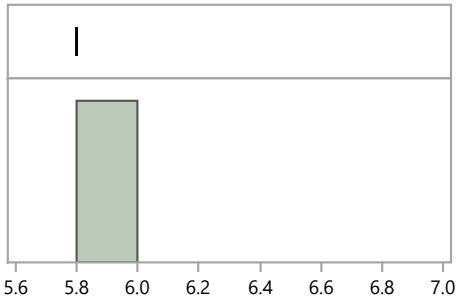
**Summary Statistics**

Mean	-1.8
Std Dev	6.0
Std Err Mean	0.8
Upper 95% Mean	-0.2
Lower 95% Mean	-3.5
N	53.0

**MaW Distribution by Prep Method**

**Distributions Analyte\_Method=Cobalt-57 Wet ash - Acid digestion - the use of oxidizers to destroy organics**

Bias



**Quantiles**

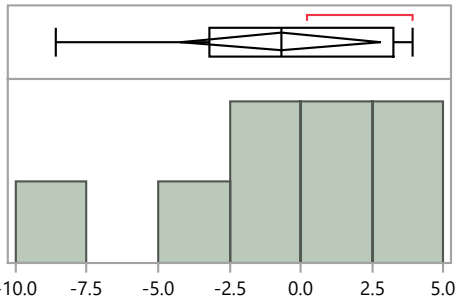
100.0%	maximum	5.8
99.5%		5.8
97.5%		5.8
90.0%		5.8
75.0%	quartile	5.8
50.0%	median	5.8
25.0%	quartile	5.8
10.0%		5.8
2.5%		5.8
0.5%		5.8
0.0%	minimum	5.8

**Summary Statistics**

Mean	5.8
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

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

Bias



**Quantiles**

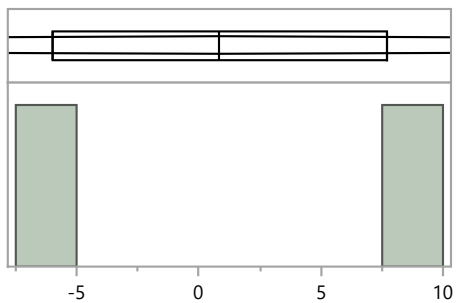
100.0%	maximum	3.9
99.5%		3.9
97.5%		3.9
90.0%		3.9
75.0%	quartile	3.3
50.0%	median	-0.7
25.0%	quartile	-3.2
10.0%		-8.6
2.5%		-8.6
0.5%		-8.6
0.0%	minimum	-8.6

**Summary Statistics**

Mean	-0.7
Std Dev	4.2
Std Err Mean	1.5
Upper 95% Mean	2.8
Lower 95% Mean	-4.2
N	8.0

**Distributions Analyte\_Method=Cobalt-60 Evaporation, straight**

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	0.9
25.0%	quartile	-6.0
10.0%		-6.0
2.5%		-6.0
0.5%		-6.0
0.0%	minimum	-6.0

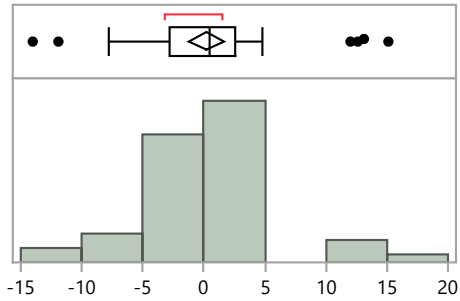
**Summary Statistics**

Mean	0.9
Std Dev	9.7
Std Err Mean	6.9
Upper 95% Mean	87.9
Lower 95% Mean	-86.2
N	2.0

**MaW Distribution by Prep Method**

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

**Bias**



**Quantiles**

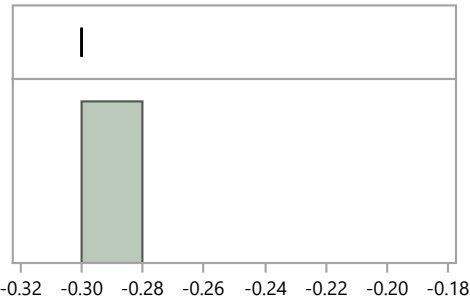
100.0%	maximum	15.1
99.5%		15.1
97.5%		14.4
90.0%		4.8
75.0%	quartile	2.5
50.0%	median	0.5
25.0%	quartile	-2.8
10.0%		-5.4
2.5%		-13.3
0.5%		-14.0
0.0%	minimum	-14.0

**Summary Statistics**

Mean	0.2
Std Dev	5.3
Std Err Mean	0.7
Upper 95% Mean	1.7
Lower 95% Mean	-1.2
N	53.0

**Distributions Analyte\_Method=Cobalt-60 Wet ash - Acid digestion - the use of oxidizers to destroy organics**

**Bias**



**Quantiles**

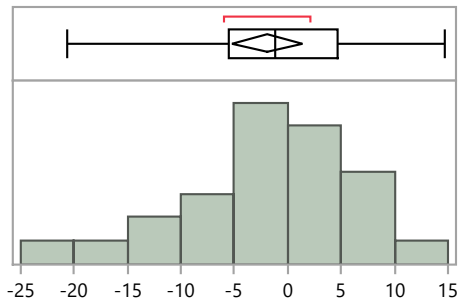
100.0%	maximum	-0.3
99.5%		-0.3
97.5%		-0.3
90.0%		-0.3
75.0%	quartile	-0.3
50.0%	median	-0.3
25.0%	quartile	-0.3
10.0%		-0.3
2.5%		-0.3
0.5%		-0.3
0.0%	minimum	-0.3

**Summary Statistics**

Mean	-0.3
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

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

**Bias**



**Quantiles**

100.0%	maximum	14.7
99.5%		14.7
97.5%		14.7
90.0%		6.6
75.0%	quartile	4.6
50.0%	median	-1.2
25.0%	quartile	-5.5
10.0%		-14.7
2.5%		-20.6
0.5%		-20.6
0.0%	minimum	-20.6

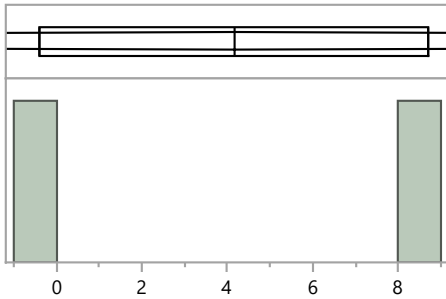
**Summary Statistics**

Mean	-1.9
Std Dev	8.1
Std Err Mean	1.6
Upper 95% Mean	1.4
Lower 95% Mean	-5.3
N	25.0

**MaW Distribution by Prep Method**

**Distributions Analyte\_Method=Hydrogen-3 EPA 901.1, Gamma Emitting, 600/4-80-032**

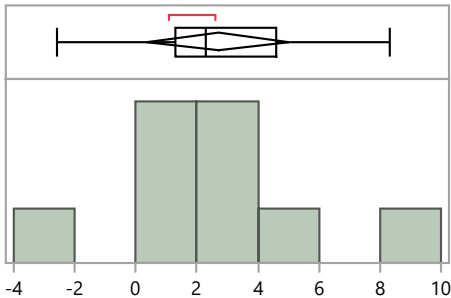
**Bias**



Quantiles			Summary Statistics	
100.0%	maximum	8.7	Mean	4.2
99.5%		8.7	Std Dev	6.4
97.5%		8.7	Std Err Mean	4.6
90.0%		8.7	Upper 95% Mean	62.0
75.0%	quartile	8.7	Lower 95% Mean	-53.7
50.0%	median	4.2	N	2.0
25.0%	quartile	-0.4		
10.0%		-0.4		
2.5%		-0.4		
0.5%		-0.4		
0.0%	minimum	-0.4		

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

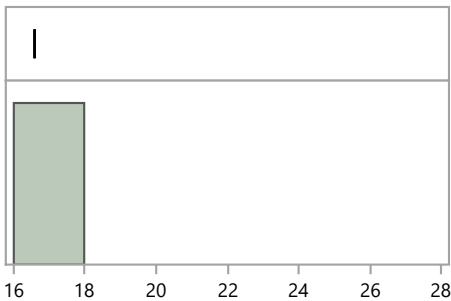
**Bias**



Quantiles			Summary Statistics	
100.0%	maximum	8.3	Mean	2.7
99.5%		8.3	Std Dev	3.1
97.5%		8.3	Std Err Mean	1.0
90.0%		8.3	Upper 95% Mean	5.0
75.0%	quartile	4.6	Lower 95% Mean	0.3
50.0%	median	2.3	N	9.0
25.0%	quartile	1.3		
10.0%		-2.6		
2.5%		-2.6		
0.5%		-2.6		
0.0%	minimum	-2.6		

**Distributions Analyte\_Method=Hydrogen-3 Evaporation, straight**

**Bias**

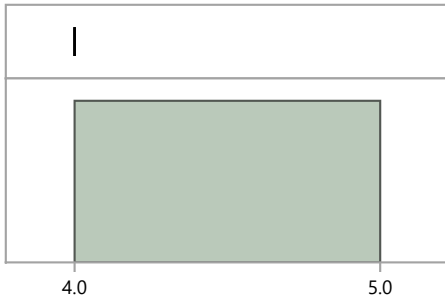


Quantiles			Summary Statistics	
100.0%	maximum	16.6	Mean	16.6
99.5%		16.6	Std Dev	.
97.5%		16.6	Std Err Mean	.
90.0%		16.6	Upper 95% Mean	.
75.0%	quartile	16.6	Lower 95% Mean	.
50.0%	median	16.6	N	1.0
25.0%	quartile	16.6		
10.0%		16.6		
2.5%		16.6		
0.5%		16.6		
0.0%	minimum	16.6		

**MaW Distribution by Prep Method**

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

Bias



**Quantiles**

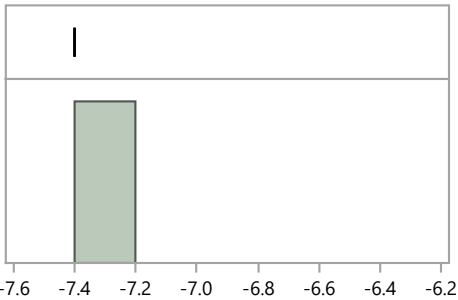
100.0%	maximum	4.0
99.5%		4.0
97.5%		4.0
90.0%		4.0
75.0%	quartile	4.0
50.0%	median	4.0
25.0%	quartile	4.0
10.0%		4.0
2.5%		4.0
0.5%		4.0
0.0%	minimum	4.0

**Summary Statistics**

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

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

Bias



**Quantiles**

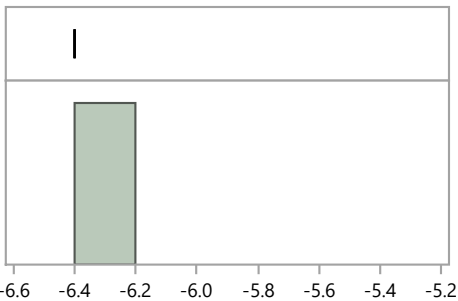
100.0%	maximum	-7.4
99.5%		-7.4
97.5%		-7.4
90.0%		-7.4
75.0%	quartile	-7.4
50.0%	median	-7.4
25.0%	quartile	-7.4
10.0%		-7.4
2.5%		-7.4
0.5%		-7.4
0.0%	minimum	-7.4

**Summary Statistics**

Mean	-7.4
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

**Distributions Analyte\_Method=Iron-55 Acid dissolution by strong Aqua Regia, hydrofluoric acid, etc.**

Bias



**Quantiles**

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

**Summary Statistics**

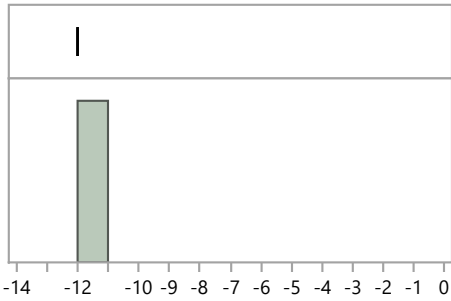
Mean	-6.4
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

MaW41 Distribution by Preparation Method

**MaW Distribution by Prep Method**

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

**Bias**



**Quantiles**

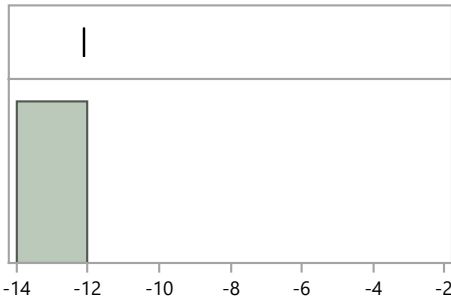
100.0%	maximum	-12.0
99.5%		-12.0
97.5%		-12.0
90.0%		-12.0
75.0%	quartile	-12.0
50.0%	median	-12.0
25.0%	quartile	-12.0
10.0%		-12.0
2.5%		-12.0
0.5%		-12.0
0.0%	minimum	-12.0

**Summary Statistics**

Mean	-12.0
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

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

**Bias**



**Quantiles**

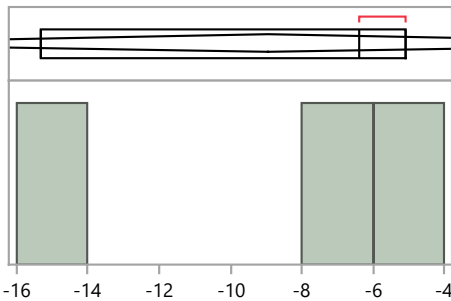
100.0%	maximum	-12.1
99.5%		-12.1
97.5%		-12.1
90.0%		-12.1
75.0%	quartile	-12.1
50.0%	median	-12.1
25.0%	quartile	-12.1
10.0%		-12.1
2.5%		-12.1
0.5%		-12.1
0.0%	minimum	-12.1

**Summary Statistics**

Mean	-12.1
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

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

**Bias**



**Quantiles**

100.0%	maximum	-5.1
99.5%		-5.1
97.5%		-5.1
90.0%		-5.1
75.0%	quartile	-5.1
50.0%	median	-6.4
25.0%	quartile	-15.3
10.0%		-15.3
2.5%		-15.3
0.5%		-15.3
0.0%	minimum	-15.3

**Summary Statistics**

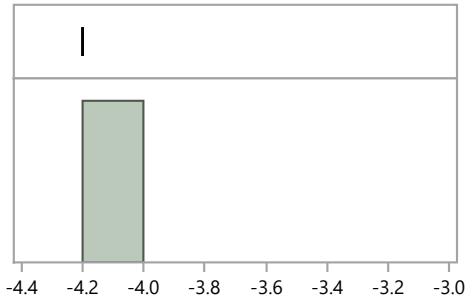
Mean	-8.9
Std Dev	5.6
Std Err Mean	3.2
Upper 95% Mean	4.9
Lower 95% Mean	-22.7
N	3.0

MaW41 Distribution by Preparation Method

**MaW Distribution by Prep Method**

**Distributions Analyte\_Method=Iron-55 No preparation - analyzed as received**

**Bias**



**Quantiles**

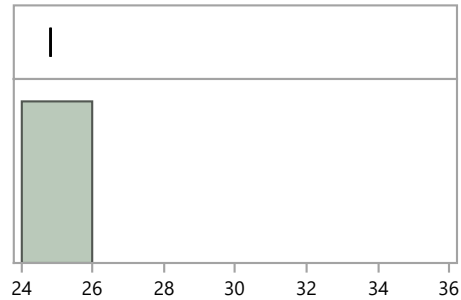
100.0%	maximum	-4.2
99.5%		-4.2
97.5%		-4.2
90.0%		-4.2
75.0%	quartile	-4.2
50.0%	median	-4.2
25.0%	quartile	-4.2
10.0%		-4.2
2.5%		-4.2
0.5%		-4.2
0.0%	minimum	-4.2

**Summary Statistics**

Mean	-4.2
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

**Distributions Analyte\_Method=Iron-55 Other**

**Bias**



**Quantiles**

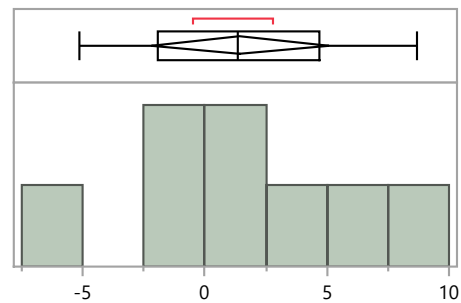
100.0%	maximum	24.8
99.5%		24.8
97.5%		24.8
90.0%		24.8
75.0%	quartile	24.8
50.0%	median	24.8
25.0%	quartile	24.8
10.0%		24.8
2.5%		24.8
0.5%		24.8
0.0%	minimum	24.8

**Summary Statistics**

Mean	24.8
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

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

**Bias**



**Quantiles**

100.0%	maximum	8.7
99.5%		8.7
97.5%		8.7
90.0%		8.7
75.0%	quartile	4.7
50.0%	median	1.4
25.0%	quartile	-1.9
10.0%		-5.1
2.5%		-5.1
0.5%		-5.1
0.0%	minimum	-5.1

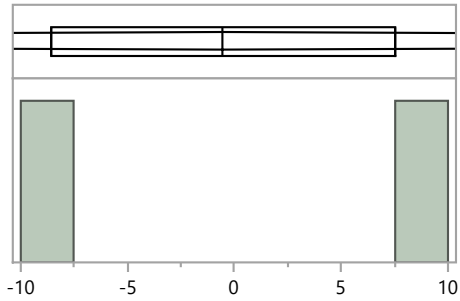
**Summary Statistics**

Mean	1.4
Std Dev	4.3
Std Err Mean	1.5
Upper 95% Mean	5.1
Lower 95% Mean	-2.2
N	8.0

**MaW Distribution by Prep Method**

**Distributions Analyte\_Method=Manganese-54 Evaporation, straight**

**Bias**



**Quantiles**

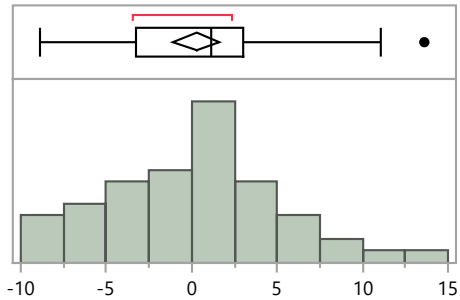
100.0%	maximum	7.5
99.5%		7.5
97.5%		7.5
90.0%		7.5
75.0%	quartile	7.5
50.0%	median	-0.5
25.0%	quartile	-8.6
10.0%		-8.6
2.5%		-8.6
0.5%		-8.6
0.0%	minimum	-8.6

**Summary Statistics**

Mean	-0.5
Std Dev	11.4
Std Err Mean	8.1
Upper 95% Mean	101.7
Lower 95% Mean	-102.8
N	2.0

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

**Bias**



**Quantiles**

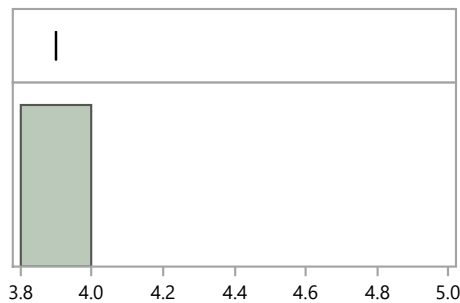
100.0%	maximum	13.6
99.5%		13.6
97.5%		12.7
90.0%		6.5
75.0%	quartile	3.1
50.0%	median	1.1
25.0%	quartile	-3.3
10.0%		-6.8
2.5%		-8.8
0.5%		-8.9
0.0%	minimum	-8.9

**Summary Statistics**

Mean	0.3
Std Dev	5.0
Std Err Mean	0.7
Upper 95% Mean	1.6
Lower 95% Mean	-1.1
N	53.0

**Distributions Analyte\_Method=Manganese-54 Wet ash - Acid digestion - the use of oxidizers to destroy organics**

**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**

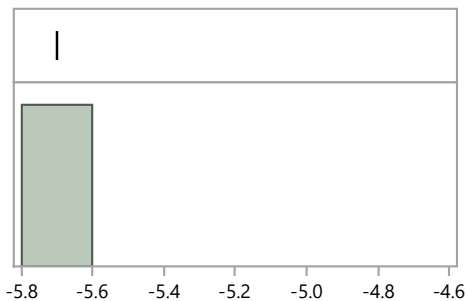
Mean	3.9
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0



**MaW Distribution by Prep Method**

**Distributions Analyte\_Method=Nickel-63 Acid dissolution by strong Aqua Regia, hydrofluoric acid, etc.**

**Bias**



**Quantiles**

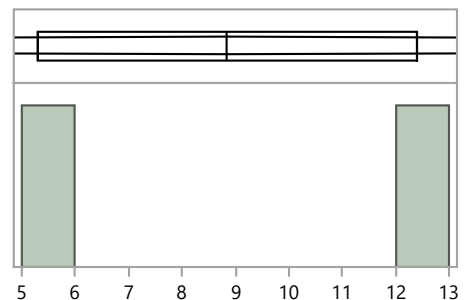
100.0%	maximum	-5.7
99.5%		-5.7
97.5%		-5.7
90.0%		-5.7
75.0%	quartile	-5.7
50.0%	median	-5.7
25.0%	quartile	-5.7
10.0%		-5.7
2.5%		-5.7
0.5%		-5.7
0.0%	minimum	-5.7

**Summary Statistics**

Mean	-5.7
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

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

**Bias**



**Quantiles**

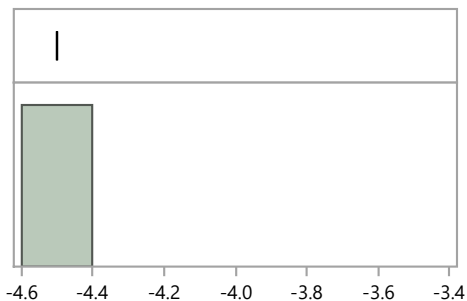
100.0%	maximum	12.4
99.5%		12.4
97.5%		12.4
90.0%		12.4
75.0%	quartile	12.4
50.0%	median	8.9
25.0%	quartile	5.3
10.0%		5.3
2.5%		5.3
0.5%		5.3
0.0%	minimum	5.3

**Summary Statistics**

Mean	8.9
Std Dev	5.0
Std Err Mean	3.6
Upper 95% Mean	54.0
Lower 95% Mean	-36.3
N	2.0

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

**Bias**



**Quantiles**

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

**Summary Statistics**

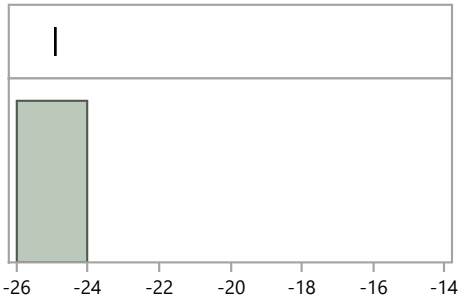
Mean	-4.5
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

MaW41 Distribution by Preparation Method

**MaW Distribution by Prep Method**

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

**Bias**



**Quantiles**

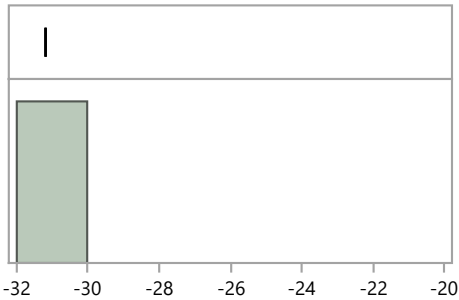
100.0%	maximum	-24.9
99.5%		-24.9
97.5%		-24.9
90.0%		-24.9
75.0%	quartile	-24.9
50.0%	median	-24.9
25.0%	quartile	-24.9
10.0%		-24.9
2.5%		-24.9
0.5%		-24.9
0.0%	minimum	-24.9

**Summary Statistics**

Mean	-24.9
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

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

**Bias**



**Quantiles**

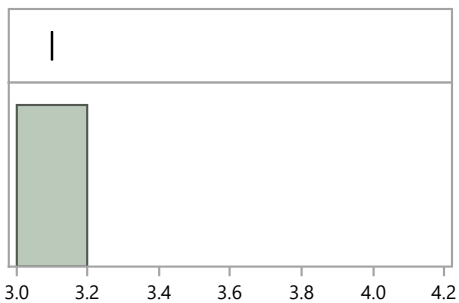
100.0%	maximum	-31.2
99.5%		-31.2
97.5%		-31.2
90.0%		-31.2
75.0%	quartile	-31.2
50.0%	median	-31.2
25.0%	quartile	-31.2
10.0%		-31.2
2.5%		-31.2
0.5%		-31.2
0.0%	minimum	-31.2

**Summary Statistics**

Mean	-31.2
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	3.1
99.5%		3.1
97.5%		3.1
90.0%		3.1
75.0%	quartile	3.1
50.0%	median	3.1
25.0%	quartile	3.1
10.0%		3.1
2.5%		3.1
0.5%		3.1
0.0%	minimum	3.1

**Summary Statistics**

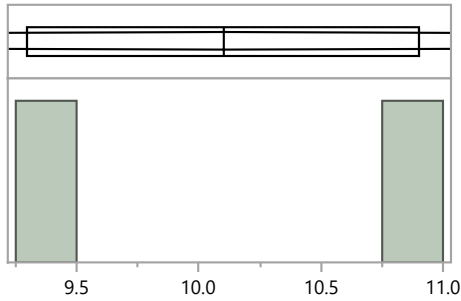
Mean	3.1
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

MaW41 Distribution by Preparation Method

**MaW Distribution by Prep Method**

**Distributions Analyte\_Method=Nickel-63 No preparation - analyzed as received**

**Bias**



**Quantiles**

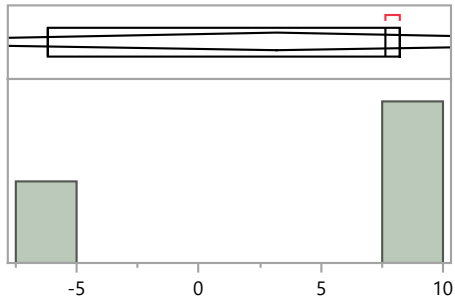
100.0%	maximum	10.9
99.5%		10.9
97.5%		10.9
90.0%		10.9
75.0%	quartile	10.9
50.0%	median	10.1
25.0%	quartile	9.3
10.0%		9.3
2.5%		9.3
0.5%		9.3
0.0%	minimum	9.3

**Summary Statistics**

Mean	10.1
Std Dev	1.1
Std Err Mean	0.8
Upper 95% Mean	20.3
Lower 95% Mean	-0.1
N	2.0

**Distributions Analyte\_Method=Nickel-63 Other**

**Bias**



**Quantiles**

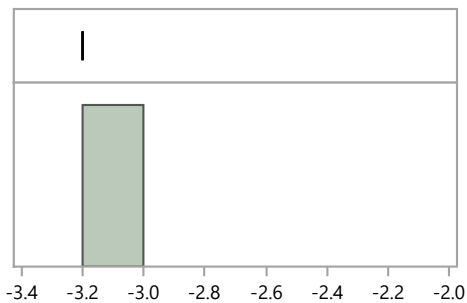
100.0%	maximum	8.2
99.5%		8.2
97.5%		8.2
90.0%		8.2
75.0%	quartile	8.2
50.0%	median	7.6
25.0%	quartile	-6.2
10.0%		-6.2
2.5%		-6.2
0.5%		-6.2
0.0%	minimum	-6.2

**Summary Statistics**

Mean	3.2
Std Dev	8.1
Std Err Mean	4.7
Upper 95% Mean	23.4
Lower 95% Mean	-17.0
N	3.0

**Distributions Analyte\_Method=Plutonium-239/240 Acid dissolution by strong Aqua Regia, hydrofluoric acid, etc.**

**Bias**



**Quantiles**

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

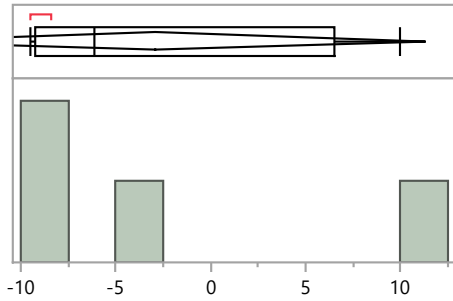
**Summary Statistics**

Mean	-3.2
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 Coprecipitation, acidified**

**Bias**



**Quantiles**

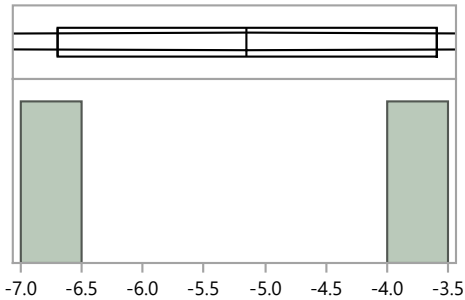
100.0%	maximum	10.0
99.5%		10.0
97.5%		10.0
90.0%		10.0
75.0%	quartile	6.6
50.0%	median	-6.1
25.0%	quartile	-9.2
10.0%		-9.5
2.5%		-9.5
0.5%		-9.5
0.0%	minimum	-9.5

**Summary Statistics**

Mean	-2.9
Std Dev	9.0
Std Err Mean	4.5
Upper 95% Mean	11.3
Lower 95% Mean	-17.2
N	4.0

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

**Bias**



**Quantiles**

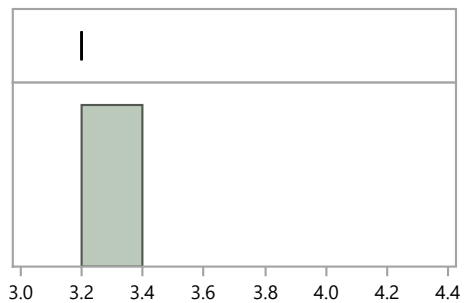
100.0%	maximum	-3.6
99.5%		-3.6
97.5%		-3.6
90.0%		-3.6
75.0%	quartile	-3.6
50.0%	median	-5.2
25.0%	quartile	-6.7
10.0%		-6.7
2.5%		-6.7
0.5%		-6.7
0.0%	minimum	-6.7

**Summary Statistics**

Mean	-5.2
Std Dev	2.2
Std Err Mean	1.6
Upper 95% Mean	14.5
Lower 95% Mean	-24.8
N	2.0

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

**Bias**



**Quantiles**

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

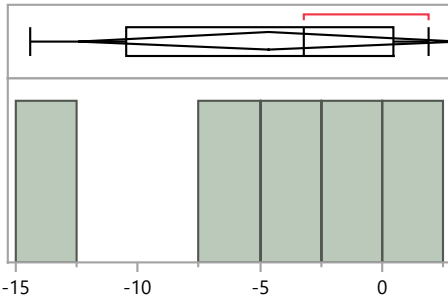
**Summary Statistics**

Mean	3.2
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 Evaporation, acidified**

**Bias**



**Quantiles**

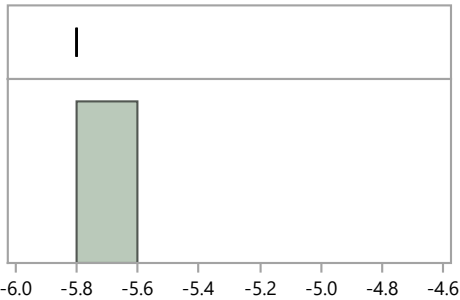
100.0%	maximum	1.9
99.5%		1.9
97.5%		1.9
90.0%		1.9
75.0%	quartile	0.5
50.0%	median	-3.2
25.0%	quartile	-10.5
10.0%		-14.4
2.5%		-14.4
0.5%		-14.4
0.0%	minimum	-14.4

**Summary Statistics**

Mean	-4.7
Std Dev	6.3
Std Err Mean	2.8
Upper 95% Mean	3.1
Lower 95% Mean	-12.4
N	5.0

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

**Bias**



**Quantiles**

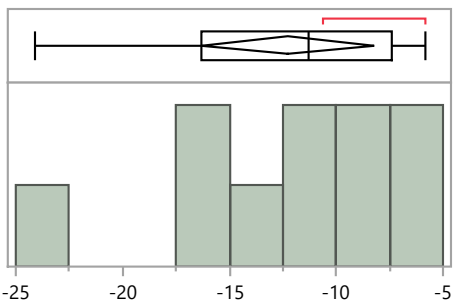
100.0%	maximum	-5.8
99.5%		-5.8
97.5%		-5.8
90.0%		-5.8
75.0%	quartile	-5.8
50.0%	median	-5.8
25.0%	quartile	-5.8
10.0%		-5.8
2.5%		-5.8
0.5%		-5.8
0.0%	minimum	-5.8

**Summary Statistics**

Mean	-5.8
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

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

**Bias**



**Quantiles**

100.0%	maximum	-5.8
99.5%		-5.8
97.5%		-5.8
90.0%		-5.9
75.0%	quartile	-7.4
50.0%	median	-11.3
25.0%	quartile	-16.3
10.0%		-23.4
2.5%		-24.1
0.5%		-24.1
0.0%	minimum	-24.1

**Summary Statistics**

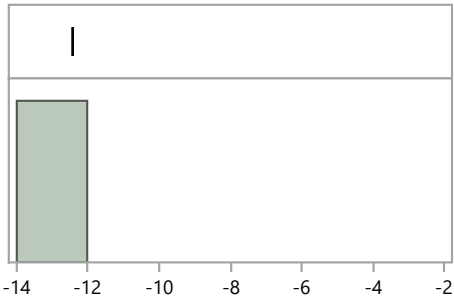
Mean	-12.3
Std Dev	5.6
Std Err Mean	1.8
Upper 95% Mean	-8.2
Lower 95% Mean	-16.3
N	10.0

MaW41 Distribution by Preparation Method

**MaW Distribution by Prep Method**

**Distributions Analyte\_Method=Plutonium-239/240 No preparation - analyzed as received**

**Bias**



**Quantiles**

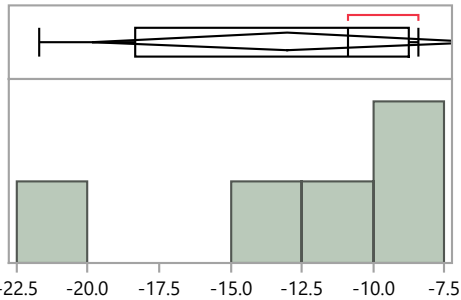
100.0%	maximum	-12.4
99.5%		-12.4
97.5%		-12.4
90.0%		-12.4
75.0%	quartile	-12.4
50.0%	median	-12.4
25.0%	quartile	-12.4
10.0%		-12.4
2.5%		-12.4
0.5%		-12.4
0.0%	minimum	-12.4

**Summary Statistics**

Mean	-12.4
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

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

**Bias**



**Quantiles**

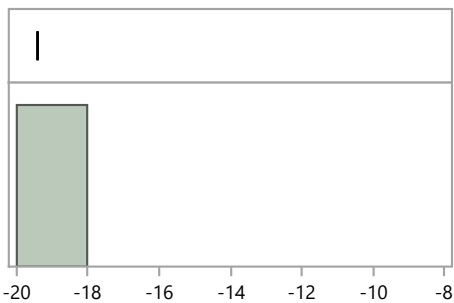
100.0%	maximum	-8.4
99.5%		-8.4
97.5%		-8.4
90.0%		-8.4
75.0%	quartile	-8.8
50.0%	median	-10.9
25.0%	quartile	-18.4
10.0%		-21.7
2.5%		-21.7
0.5%		-21.7
0.0%	minimum	-21.7

**Summary Statistics**

Mean	-13.0
Std Dev	5.5
Std Err Mean	2.5
Upper 95% Mean	-6.2
Lower 95% Mean	-19.8
N	5.0

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

**Bias**



**Quantiles**

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

**Summary Statistics**

Mean	-19.4
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

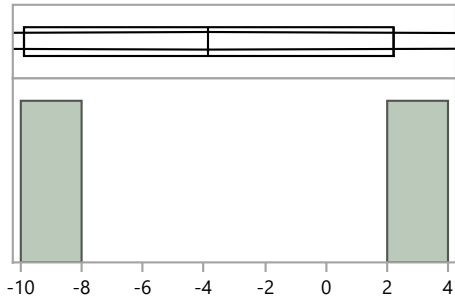
## MaW41 Distribution by Preparation Method



**MaW Distribution by Prep Method**

**Distributions Analyte\_Method=Plutonium-239/240 Wet ash - Acid digestion - the use of oxidizers to destroy organics**

**Bias**



**Quantiles**

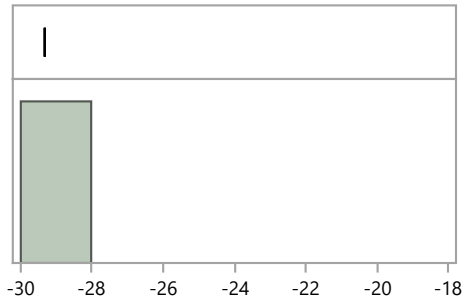
100.0%	maximum	2.2
99.5%		2.2
97.5%		2.2
90.0%		2.2
75.0%	quartile	2.2
50.0%	median	-3.9
25.0%	quartile	-9.9
10.0%		-9.9
2.5%		-9.9
0.5%		-9.9
0.0%	minimum	-9.9

**Summary Statistics**

Mean	-3.9
Std Dev	8.6
Std Err Mean	6.1
Upper 95% Mean	73.0
Lower 95% Mean	-80.7
N	2.0

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

**Bias**



**Quantiles**

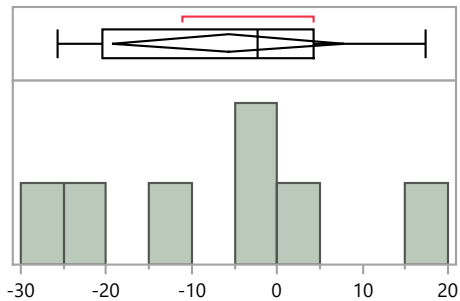
100.0%	maximum	-29.3
99.5%		-29.3
97.5%		-29.3
90.0%		-29.3
75.0%	quartile	-29.3
50.0%	median	-29.3
25.0%	quartile	-29.3
10.0%		-29.3
2.5%		-29.3
0.5%		-29.3
0.0%	minimum	-29.3

**Summary Statistics**

Mean	-29.3
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	17.3
99.5%		17.3
97.5%		17.3
90.0%		17.3
75.0%	quartile	4.2
50.0%	median	-2.3
25.0%	quartile	-20.5
10.0%		-25.7
2.5%		-25.7
0.5%		-25.7
0.0%	minimum	-25.7

**Summary Statistics**

Mean	-5.7
Std Dev	14.7
Std Err Mean	5.6
Upper 95% Mean	7.9
Lower 95% Mean	-19.3
N	7.0



## MaW41 Distribution by Preparation Method

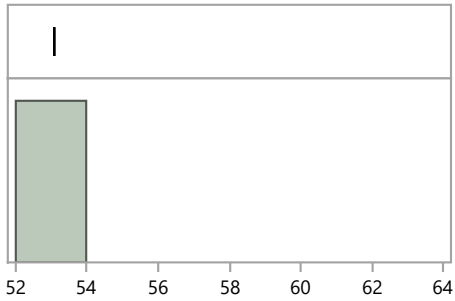


MaW41 Distribution by Preparation Method

**MaW Distribution by Prep Method**

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

Bias



**Quantiles**

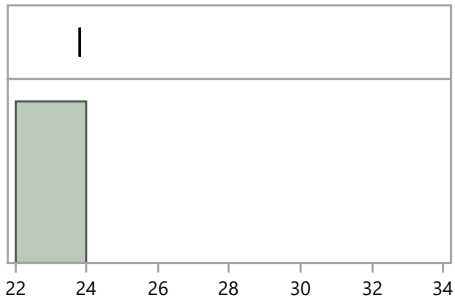
100.0%	maximum	53.1
99.5%		53.1
97.5%		53.1
90.0%		53.1
75.0%	quartile	53.1
50.0%	median	53.1
25.0%	quartile	53.1
10.0%		53.1
2.5%		53.1
0.5%		53.1
0.0%	minimum	53.1

**Summary Statistics**

Mean	53.1
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

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

Bias



**Quantiles**

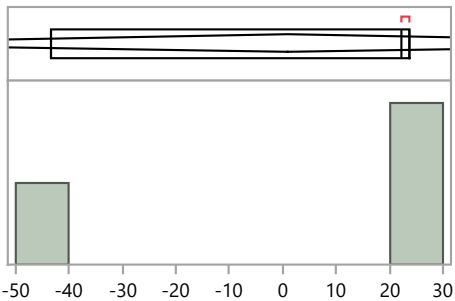
100.0%	maximum	23.8
99.5%		23.8
97.5%		23.8
90.0%		23.8
75.0%	quartile	23.8
50.0%	median	23.8
25.0%	quartile	23.8
10.0%		23.8
2.5%		23.8
0.5%		23.8
0.0%	minimum	23.8

**Summary Statistics**

Mean	23.8
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	23.8
99.5%		23.8
97.5%		23.8
90.0%		23.8
75.0%	quartile	23.8
50.0%	median	22.2
25.0%	quartile	-43.3
10.0%		-43.3
2.5%		-43.3
0.5%		-43.3
0.0%	minimum	-43.3

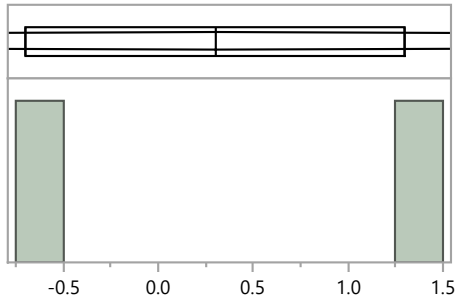
**Summary Statistics**

Mean	0.9
Std Dev	38.3
Std Err Mean	22.1
Upper 95% Mean	96.0
Lower 95% Mean	-94.2
N	3.0

**MaW Distribution by Prep Method**

**Distributions Analyte\_Method=Radium-226 No preparation - analyzed as received**

**Bias**



**Quantiles**

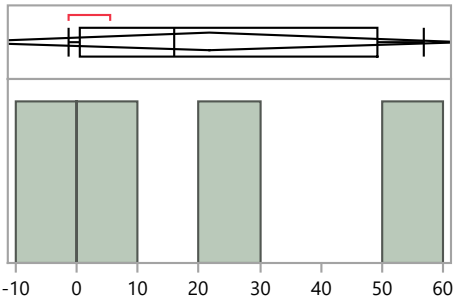
100.0%	maximum	1.3
99.5%		1.3
97.5%		1.3
90.0%		1.3
75.0%	quartile	1.3
50.0%	median	0.3
25.0%	quartile	-0.7
10.0%		-0.7
2.5%		-0.7
0.5%		-0.7
0.0%	minimum	-0.7

**Summary Statistics**

Mean	0.3
Std Dev	1.4
Std Err Mean	1.0
Upper 95% Mean	13.0
Lower 95% Mean	-12.4
N	2.0

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

**Bias**



**Quantiles**

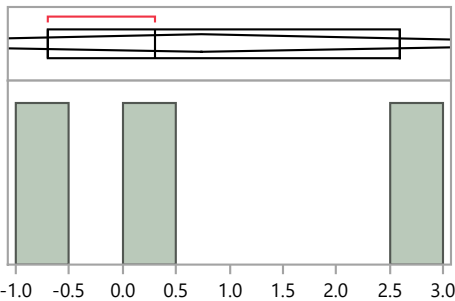
100.0%	maximum	56.7
99.5%		56.7
97.5%		56.7
90.0%		56.7
75.0%	quartile	49.1
50.0%	median	16.0
25.0%	quartile	0.4
10.0%		-1.3
2.5%		-1.3
0.5%		-1.3
0.0%	minimum	-1.3

**Summary Statistics**

Mean	21.8
Std Dev	26.0
Std Err Mean	13.0
Upper 95% Mean	63.3
Lower 95% Mean	-19.6
N	4.0

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

**Bias**



**Quantiles**

100.0%	maximum	2.6
99.5%		2.6
97.5%		2.6
90.0%		2.6
75.0%	quartile	2.6
50.0%	median	0.3
25.0%	quartile	-0.7
10.0%		-0.7
2.5%		-0.7
0.5%		-0.7
0.0%	minimum	-0.7

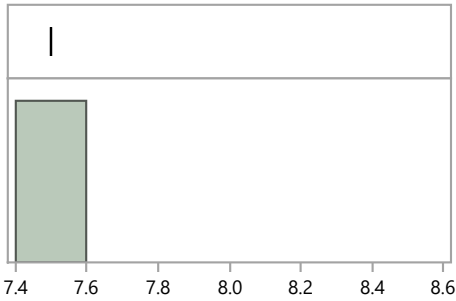
**Summary Statistics**

Mean	0.7
Std Dev	1.7
Std Err Mean	1.0
Upper 95% Mean	4.9
Lower 95% Mean	-3.5
N	3.0

**MaW Distribution by Prep Method**

**Distributions Analyte\_Method=Strontium-90 Acid dissolution by strong Aqua Regia, hydrofluoric acid, etc.**

**Bias**



**Quantiles**

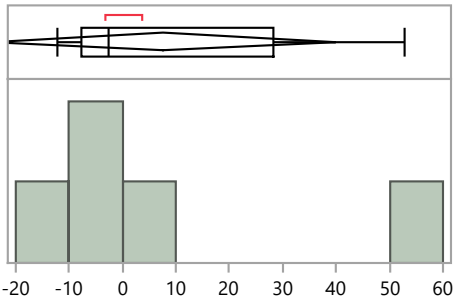
100.0%	maximum	7.5
99.5%		7.5
97.5%		7.5
90.0%		7.5
75.0%	quartile	7.5
50.0%	median	7.5
25.0%	quartile	7.5
10.0%		7.5
2.5%		7.5
0.5%		7.5
0.0%	minimum	7.5

**Summary Statistics**

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

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

**Bias**



**Quantiles**

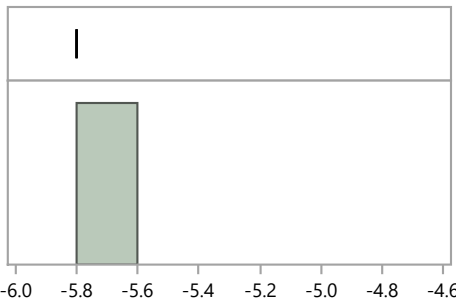
100.0%	maximum	52.8
99.5%		52.8
97.5%		52.8
90.0%		52.8
75.0%	quartile	28.2
50.0%	median	-2.5
25.0%	quartile	-7.7
10.0%		-12.2
2.5%		-12.2
0.5%		-12.2
0.0%	minimum	-12.2

**Summary Statistics**

Mean	7.7
Std Dev	25.8
Std Err Mean	11.6
Upper 95% Mean	39.8
Lower 95% Mean	-24.4
N	5.0

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

**Bias**



**Quantiles**

100.0%	maximum	-5.8
99.5%		-5.8
97.5%		-5.8
90.0%		-5.8
75.0%	quartile	-5.8
50.0%	median	-5.8
25.0%	quartile	-5.8
10.0%		-5.8
2.5%		-5.8
0.5%		-5.8
0.0%	minimum	-5.8

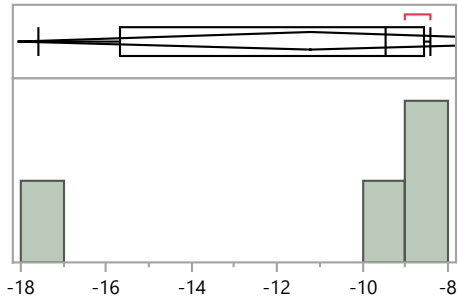
**Summary Statistics**

Mean	-5.8
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

**MaW Distribution by Prep Method**

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

**Bias**



**Quantiles**

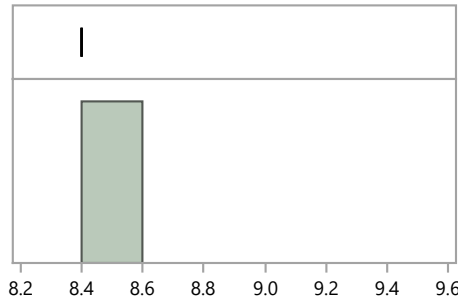
100.0%	maximum	-8.4
99.5%		-8.4
97.5%		-8.4
90.0%		-8.4
75.0%	quartile	-8.6
50.0%	median	-9.5
25.0%	quartile	-15.7
10.0%		-17.6
2.5%		-17.6
0.5%		-17.6
0.0%	minimum	-17.6

**Summary Statistics**

Mean	-11.2
Std Dev	4.3
Std Err Mean	2.1
Upper 95% Mean	-4.4
Lower 95% Mean	-18.1
N	4.0

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

**Bias**



**Quantiles**

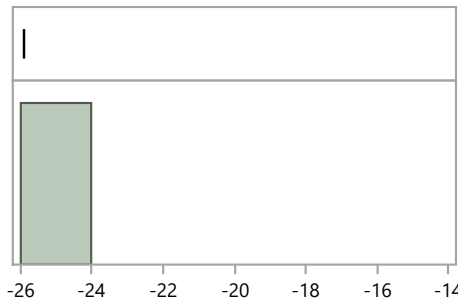
100.0%	maximum	8.4
99.5%		8.4
97.5%		8.4
90.0%		8.4
75.0%	quartile	8.4
50.0%	median	8.4
25.0%	quartile	8.4
10.0%		8.4
2.5%		8.4
0.5%		8.4
0.0%	minimum	8.4

**Summary Statistics**

Mean	8.4
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

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

**Bias**



**Quantiles**

100.0%	maximum	-25.9
99.5%		-25.9
97.5%		-25.9
90.0%		-25.9
75.0%	quartile	-25.9
50.0%	median	-25.9
25.0%	quartile	-25.9
10.0%		-25.9
2.5%		-25.9
0.5%		-25.9
0.0%	minimum	-25.9

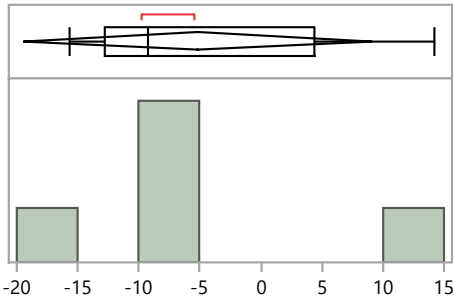
**Summary Statistics**

Mean	-25.9
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

**MaW Distribution by Prep Method**

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

**Bias**



**Quantiles**

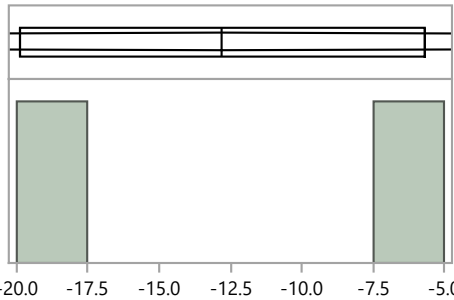
100.0%	maximum	14.2
99.5%		14.2
97.5%		14.2
90.0%		14.2
75.0%	quartile	4.4
50.0%	median	-9.2
25.0%	quartile	-12.8
10.0%		-15.7
2.5%		-15.7
0.5%		-15.7
0.0%	minimum	-15.7

**Summary Statistics**

Mean	-5.2
Std Dev	11.4
Std Err Mean	5.1
Upper 95% Mean	9.0
Lower 95% Mean	-19.4
N	5.0

**Distributions Analyte\_Method=Strontium-90 No preparation - analyzed as received**

**Bias**



**Quantiles**

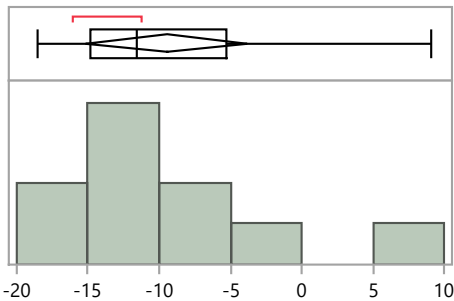
100.0%	maximum	-5.7
99.5%		-5.7
97.5%		-5.7
90.0%		-5.7
75.0%	quartile	-5.7
50.0%	median	-12.8
25.0%	quartile	-19.9
10.0%		-19.9
2.5%		-19.9
0.5%		-19.9
0.0%	minimum	-19.9

**Summary Statistics**

Mean	-12.8
Std Dev	10.0
Std Err Mean	7.1
Upper 95% Mean	77.4
Lower 95% Mean	-103.0
N	2.0

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

**Bias**



**Quantiles**

100.0%	maximum	9.1
99.5%		9.1
97.5%		9.1
90.0%		7.8
75.0%	quartile	-5.2
50.0%	median	-11.6
25.0%	quartile	-14.8
10.0%		-18.3
2.5%		-18.5
0.5%		-18.5
0.0%	minimum	-18.5

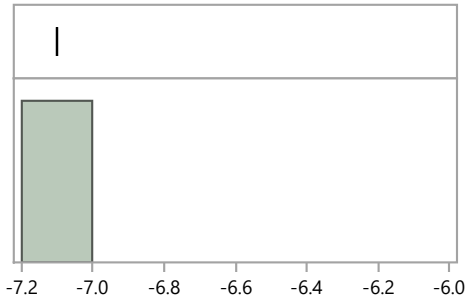
**Summary Statistics**

Mean	-9.5
Std Dev	7.9
Std Err Mean	2.5
Upper 95% Mean	-3.8
Lower 95% Mean	-15.1
N	10.0

**MaW Distribution by Prep Method**

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

**Bias**



**Quantiles**

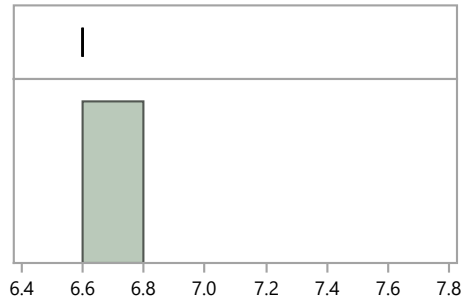
100.0%	maximum	-7.1
99.5%		-7.1
97.5%		-7.1
90.0%		-7.1
75.0%	quartile	-7.1
50.0%	median	-7.1
25.0%	quartile	-7.1
10.0%		-7.1
2.5%		-7.1
0.5%		-7.1
0.0%	minimum	-7.1

**Summary Statistics**

Mean	-7.1
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

**Distributions Analyte\_Method=Strontium-90 Wet ash - Acid digestion - the use of oxidizers to destroy organics**

**Bias**



**Quantiles**

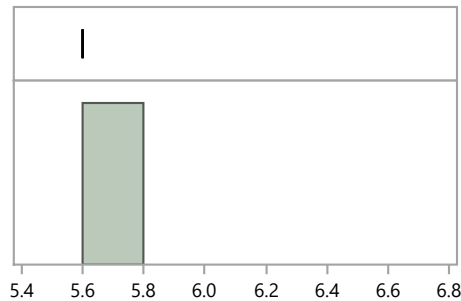
100.0%	maximum	6.6
99.5%		6.6
97.5%		6.6
90.0%		6.6
75.0%	quartile	6.6
50.0%	median	6.6
25.0%	quartile	6.6
10.0%		6.6
2.5%		6.6
0.5%		6.6
0.0%	minimum	6.6

**Summary Statistics**

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

**Distributions Analyte\_Method=Uranium-234 Acid dissolution by strong Aqua Regia, hydrofluoric acid, etc.**

**Bias**



**Quantiles**

100.0%	maximum	5.6
99.5%		5.6
97.5%		5.6
90.0%		5.6
75.0%	quartile	5.6
50.0%	median	5.6
25.0%	quartile	5.6
10.0%		5.6
2.5%		5.6
0.5%		5.6
0.0%	minimum	5.6

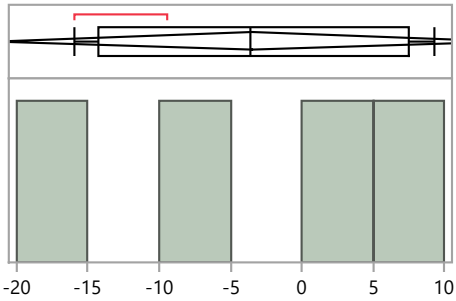
**Summary Statistics**

Mean	5.6
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

**MaW Distribution by Prep Method**

**Distributions Analyte\_Method=Uranium-234 Coprecipitation, acidified**

**Bias**



**Quantiles**

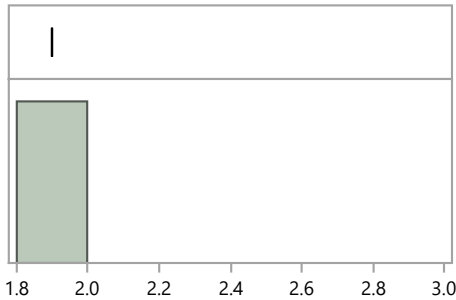
100.0%	maximum	9.3
99.5%		9.3
97.5%		9.3
90.0%		9.3
75.0%	quartile	7.5
50.0%	median	-3.7
25.0%	quartile	-14.3
10.0%		-15.9
2.5%		-15.9
0.5%		-15.9
0.0%	minimum	-15.9

**Summary Statistics**

Mean	-3.5
Std Dev	11.3
Std Err Mean	5.7
Upper 95% Mean	14.5
Lower 95% Mean	-21.5
N	4.0

**Distributions Analyte\_Method=Uranium-234 Coprecipitation, straight**

**Bias**



**Quantiles**

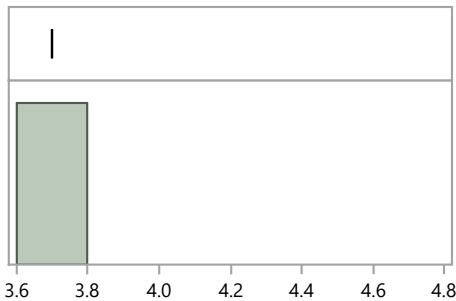
100.0%	maximum	1.9
99.5%		1.9
97.5%		1.9
90.0%		1.9
75.0%	quartile	1.9
50.0%	median	1.9
25.0%	quartile	1.9
10.0%		1.9
2.5%		1.9
0.5%		1.9
0.0%	minimum	1.9

**Summary Statistics**

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

**Distributions Analyte\_Method=Uranium-234 EPA 908, Uranium-Radiochemical Method, 600/4/80-032**

**Bias**



**Quantiles**

100.0%	maximum	3.7
99.5%		3.7
97.5%		3.7
90.0%		3.7
75.0%	quartile	3.7
50.0%	median	3.7
25.0%	quartile	3.7
10.0%		3.7
2.5%		3.7
0.5%		3.7
0.0%	minimum	3.7

**Summary Statistics**

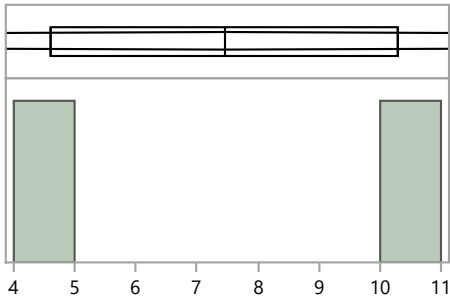
Mean	3.7
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0



**MaW Distribution by Prep Method**

**Distributions Analyte\_Method=Uranium-234 Evaporation, acidified**

Bias



**Quantiles**

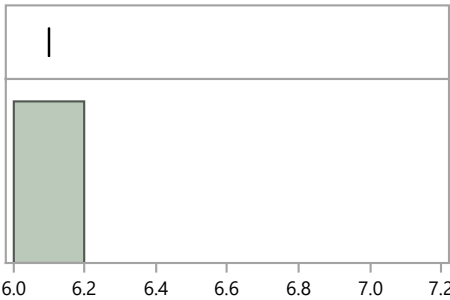
100.0%	maximum	10.3
99.5%		10.3
97.5%		10.3
90.0%		10.3
75.0%	quartile	10.3
50.0%	median	7.5
25.0%	quartile	4.6
10.0%		4.6
2.5%		4.6
0.5%		4.6
0.0%	minimum	4.6

**Summary Statistics**

Mean	7.5
Std Dev	4.0
Std Err Mean	2.9
Upper 95% Mean	43.7
Lower 95% Mean	-28.8
N	2.0

**Distributions Analyte\_Method=Uranium-234 Evaporation, straight**

Bias



**Quantiles**

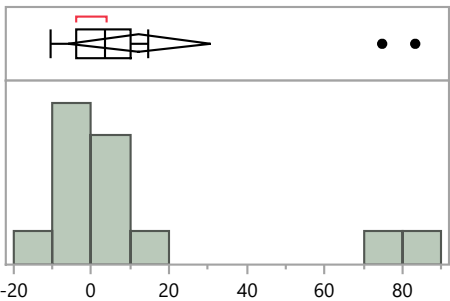
100.0%	maximum	6.1
99.5%		6.1
97.5%		6.1
90.0%		6.1
75.0%	quartile	6.1
50.0%	median	6.1
25.0%	quartile	6.1
10.0%		6.1
2.5%		6.1
0.5%		6.1
0.0%	minimum	6.1

**Summary Statistics**

Mean	6.1
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

**Distributions Analyte\_Method=Uranium-234 Ion Exchange Chromatography / Ion Chromatography**

Bias



**Quantiles**

100.0%	maximum	83.3
99.5%		83.3
97.5%		83.3
90.0%		79.9
75.0%	quartile	10.0
50.0%	median	3.7
25.0%	quartile	-3.7
10.0%		-9.5
2.5%		-10.3
0.5%		-10.3
0.0%	minimum	-10.3

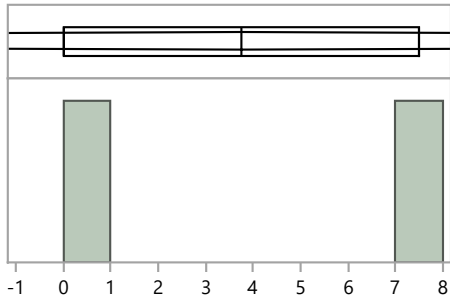
**Summary Statistics**

Mean	12.2
Std Dev	30.4
Std Err Mean	8.4
Upper 95% Mean	30.6
Lower 95% Mean	-6.1
N	13.0

**MaW Distribution by Prep Method**

**Distributions Analyte\_Method=Uranium-234 No preparation - analyzed as received**

**Bias**



**Quantiles**

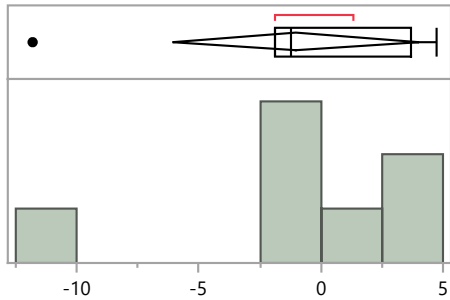
100.0%	maximum	7.5
99.5%		7.5
97.5%		7.5
90.0%		7.5
75.0%	quartile	7.5
50.0%	median	3.8
25.0%	quartile	0.0
10.0%		0.0
2.5%		0.0
0.5%		0.0
0.0%	minimum	0.0

**Summary Statistics**

Mean	3.8
Std Dev	5.3
Std Err Mean	3.8
Upper 95% Mean	51.4
Lower 95% Mean	-43.9
N	2.0

**Distributions Analyte\_Method=Uranium-234 Other**

**Bias**



**Quantiles**

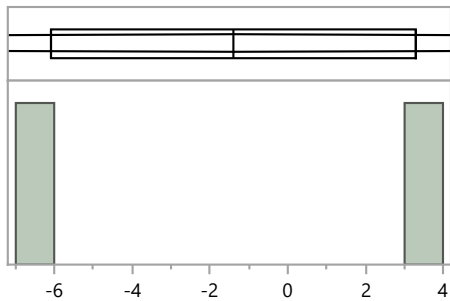
100.0%	maximum	4.7
99.5%		4.7
97.5%		4.7
90.0%		4.7
75.0%	quartile	3.7
50.0%	median	-1.2
25.0%	quartile	-1.9
10.0%		-11.8
2.5%		-11.8
0.5%		-11.8
0.0%	minimum	-11.8

**Summary Statistics**

Mean	-1.0
Std Dev	5.4
Std Err Mean	2.1
Upper 95% Mean	4.0
Lower 95% Mean	-6.1
N	7.0

**Distributions Analyte\_Method=Uranium-234 Total dissolution by fusion**

**Bias**



**Quantiles**

100.0%	maximum	3.3
99.5%		3.3
97.5%		3.3
90.0%		3.3
75.0%	quartile	3.3
50.0%	median	-1.4
25.0%	quartile	-6.1
10.0%		-6.1
2.5%		-6.1
0.5%		-6.1
0.0%	minimum	-6.1

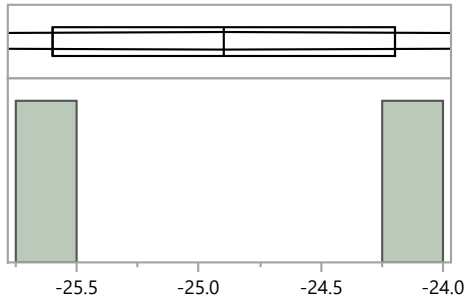
**Summary Statistics**

Mean	-1.4
Std Dev	6.6
Std Err Mean	4.7
Upper 95% Mean	58.3
Lower 95% Mean	-61.1
N	2.0

**MaW Distribution by Prep Method**

**Distributions Analyte\_Method=Uranium-234 Wet ash - Acid digestion - the use of oxidizers to destroy organics**

**Bias**



**Quantiles**

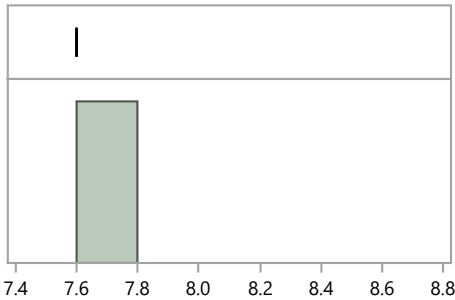
100.0%	maximum	-24.2
99.5%		-24.2
97.5%		-24.2
90.0%		-24.2
75.0%	quartile	-24.2
50.0%	median	-24.9
25.0%	quartile	-25.6
10.0%		-25.6
2.5%		-25.6
0.5%		-25.6
0.0%	minimum	-25.6

**Summary Statistics**

Mean	-24.9
Std Dev	1.0
Std Err Mean	0.7
Upper 95% Mean	-16.0
Lower 95% Mean	-33.8
N	2.0

**Distributions Analyte\_Method=Uranium-238 Acid dissolution by strong Aqua Regia, hydrofluoric acid, etc.**

**Bias**



**Quantiles**

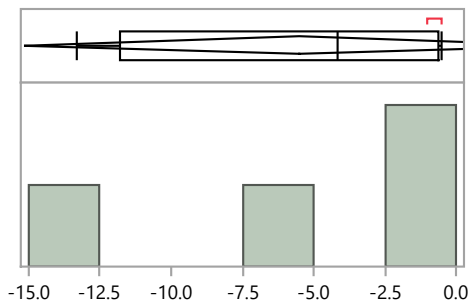
100.0%	maximum	7.6
99.5%		7.6
97.5%		7.6
90.0%		7.6
75.0%	quartile	7.6
50.0%	median	7.6
25.0%	quartile	7.6
10.0%		7.6
2.5%		7.6
0.5%		7.6
0.0%	minimum	7.6

**Summary Statistics**

Mean	7.6
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

**Distributions Analyte\_Method=Uranium-238 Coprecipitation, acidified**

**Bias**



**Quantiles**

100.0%	maximum	-0.5
99.5%		-0.5
97.5%		-0.5
90.0%		-0.5
75.0%	quartile	-0.6
50.0%	median	-4.2
25.0%	quartile	-11.8
10.0%		-13.3
2.5%		-13.3
0.5%		-13.3
0.0%	minimum	-13.3

**Summary Statistics**

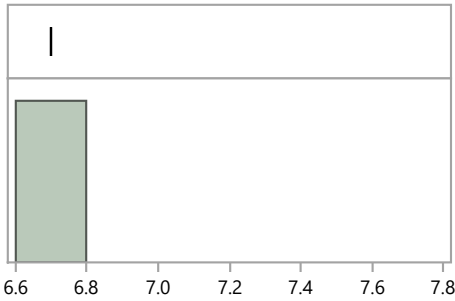
Mean	-5.5
Std Dev	6.0
Std Err Mean	3.0
Upper 95% Mean	4.1
Lower 95% Mean	-15.1
N	4.0

MaW41 Distribution by Preparation Method

**MaW Distribution by Prep Method**

**Distributions Analyte\_Method=Uranium-238 Coprecipitation, straight**

Bias



**Quantiles**

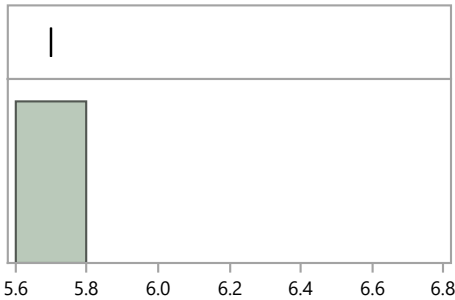
100.0%	maximum	6.7
99.5%		6.7
97.5%		6.7
90.0%		6.7
75.0%	quartile	6.7
50.0%	median	6.7
25.0%	quartile	6.7
10.0%		6.7
2.5%		6.7
0.5%		6.7
0.0%	minimum	6.7

**Summary Statistics**

Mean	6.7
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

**Distributions Analyte\_Method=Uranium-238 EPA 908, Uranium-Radiochemical Method, 600/4/80-032**

Bias



**Quantiles**

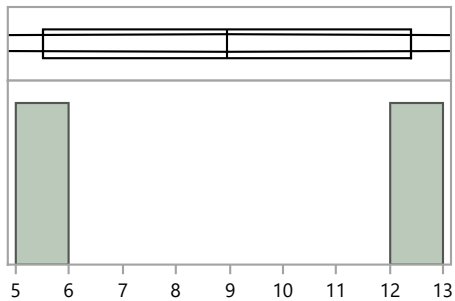
100.0%	maximum	5.7
99.5%		5.7
97.5%		5.7
90.0%		5.7
75.0%	quartile	5.7
50.0%	median	5.7
25.0%	quartile	5.7
10.0%		5.7
2.5%		5.7
0.5%		5.7
0.0%	minimum	5.7

**Summary Statistics**

Mean	5.7
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

**Distributions Analyte\_Method=Uranium-238 Evaporation, acidified**

Bias



**Quantiles**

100.0%	maximum	12.4
99.5%		12.4
97.5%		12.4
90.0%		12.4
75.0%	quartile	12.4
50.0%	median	9.0
25.0%	quartile	5.5
10.0%		5.5
2.5%		5.5
0.5%		5.5
0.0%	minimum	5.5

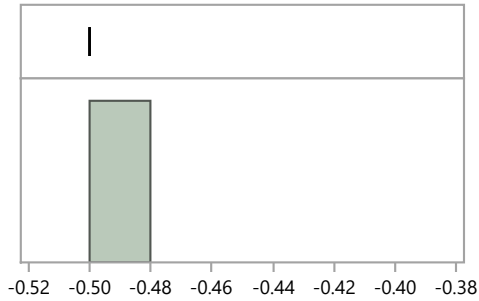
**Summary Statistics**

Mean	9.0
Std Dev	4.9
Std Err Mean	3.5
Upper 95% Mean	52.8
Lower 95% Mean	-34.9
N	2.0

**MaW Distribution by Prep Method**

**Distributions Analyte\_Method=Uranium-238 Evaporation, straight**

Bias



**Quantiles**

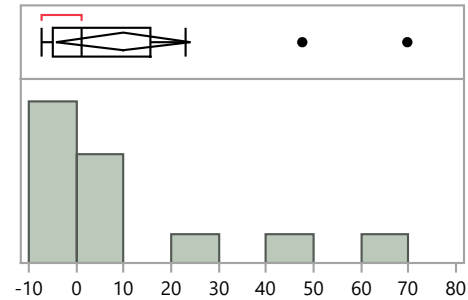
100.0%	maximum	-0.5
99.5%		-0.5
97.5%		-0.5
90.0%		-0.5
75.0%	quartile	-0.5
50.0%	median	-0.5
25.0%	quartile	-0.5
10.0%		-0.5
2.5%		-0.5
0.5%		-0.5
0.0%	minimum	-0.5

**Summary Statistics**

Mean	-0.5
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

**Distributions Analyte\_Method=Uranium-238 Ion Exchange Chromatography / Ion Chromatography**

Bias



**Quantiles**

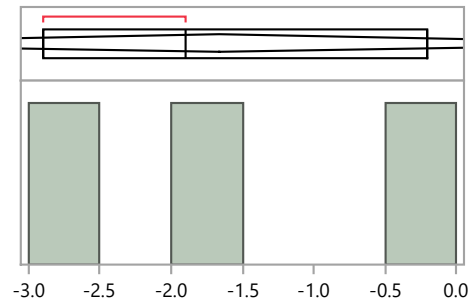
100.0%	maximum	69.7
99.5%		69.7
97.5%		69.7
90.0%		60.9
75.0%	quartile	15.7
50.0%	median	1.0
25.0%	quartile	-4.9
10.0%		-6.7
2.5%		-7.2
0.5%		-7.2
0.0%	minimum	-7.2

**Summary Statistics**

Mean	9.9
Std Dev	23.5
Std Err Mean	6.5
Upper 95% Mean	24.1
Lower 95% Mean	-4.2
N	13.0

**Distributions Analyte\_Method=Uranium-238 No preparation - analyzed as received**

Bias



**Quantiles**

100.0%	maximum	-0.2
99.5%		-0.2
97.5%		-0.2
90.0%		-0.2
75.0%	quartile	-0.2
50.0%	median	-1.9
25.0%	quartile	-2.9
10.0%		-2.9
2.5%		-2.9
0.5%		-2.9
0.0%	minimum	-2.9

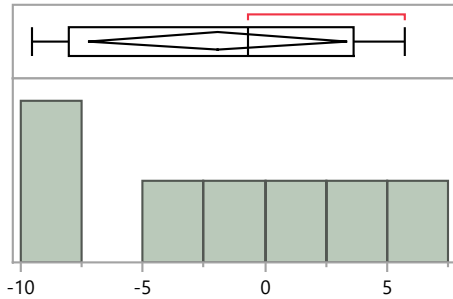
**Summary Statistics**

Mean	-1.7
Std Dev	1.4
Std Err Mean	0.8
Upper 95% Mean	1.7
Lower 95% Mean	-5.1
N	3.0

**MaW Distribution by Prep Method**

**Distributions Analyte\_Method=Uranium-238 Other**

**Bias**



**Quantiles**

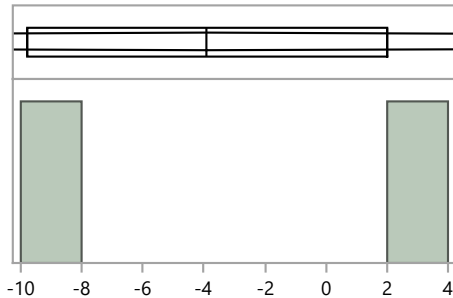
100.0%	maximum	5.7
99.5%		5.7
97.5%		5.7
90.0%		5.7
75.0%	quartile	3.6
50.0%	median	-0.7
25.0%	quartile	-8.0
10.0%		-9.5
2.5%		-9.5
0.5%		-9.5
0.0%	minimum	-9.5

**Summary Statistics**

Mean	-2.0
Std Dev	5.7
Std Err Mean	2.2
Upper 95% Mean	3.3
Lower 95% Mean	-7.2
N	7.0

**Distributions Analyte\_Method=Uranium-238 Total dissolution by fusion**

**Bias**



**Quantiles**

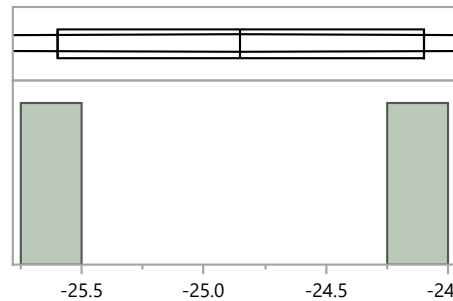
100.0%	maximum	2.0
99.5%		2.0
97.5%		2.0
90.0%		2.0
75.0%	quartile	2.0
50.0%	median	-3.9
25.0%	quartile	-9.8
10.0%		-9.8
2.5%		-9.8
0.5%		-9.8
0.0%	minimum	-9.8

**Summary Statistics**

Mean	-3.9
Std Dev	8.3
Std Err Mean	5.9
Upper 95% Mean	71.1
Lower 95% Mean	-78.9
N	2.0

**Distributions Analyte\_Method=Uranium-238 Wet ash - Acid digestion - the use of oxidizers to destroy organics**

**Bias**



**Quantiles**

100.0%	maximum	-24.1
99.5%		-24.1
97.5%		-24.1
90.0%		-24.1
75.0%	quartile	-24.1
50.0%	median	-24.9
25.0%	quartile	-25.6
10.0%		-25.6
2.5%		-25.6
0.5%		-25.6
0.0%	minimum	-25.6

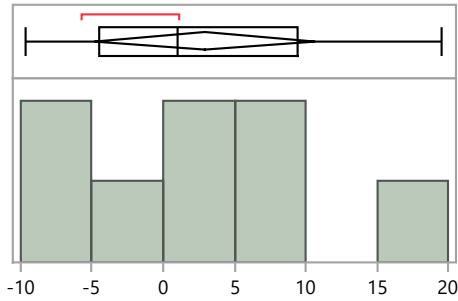
**Summary Statistics**

Mean	-24.9
Std Dev	1.1
Std Err Mean	0.8
Upper 95% Mean	-15.3
Lower 95% Mean	-34.4
N	2.0

**MaW Distribution by Prep Method**

**Distributions Analyte\_Method=Zinc-65 EPA 901.1, Gamma Emitting, 600/4-80-032**

**Bias**



**Quantiles**

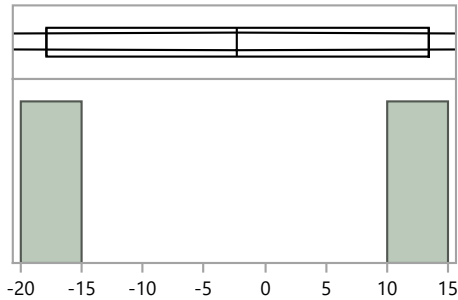
100.0%	maximum	19.5
99.5%		19.5
97.5%		19.5
90.0%		19.5
75.0%	quartile	9.4
50.0%	median	1.1
25.0%	quartile	-4.5
10.0%		-9.6
2.5%		-9.6
0.5%		-9.6
0.0%	minimum	-9.6

**Summary Statistics**

Mean	2.9
Std Dev	9.3
Std Err Mean	3.3
Upper 95% Mean	10.6
Lower 95% Mean	-4.9
N	8.0

**Distributions Analyte\_Method=Zinc-65 Evaporation, straight**

**Bias**



**Quantiles**

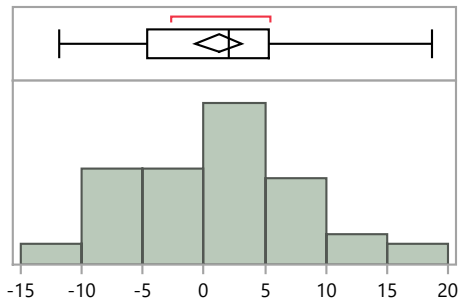
100.0%	maximum	13.4
99.5%		13.4
97.5%		13.4
90.0%		13.4
75.0%	quartile	13.4
50.0%	median	-2.2
25.0%	quartile	-17.9
10.0%		-17.9
2.5%		-17.9
0.5%		-17.9
0.0%	minimum	-17.9

**Summary Statistics**

Mean	-2.2
Std Dev	22.1
Std Err Mean	15.7
Upper 95% Mean	196.6
Lower 95% Mean	-201.1
N	2.0

**Distributions Analyte\_Method=Zinc-65 No preparation - analyzed as received**

**Bias**



**Quantiles**

100.0%	maximum	18.7
99.5%		18.7
97.5%		18.2
90.0%		10.1
75.0%	quartile	5.3
50.0%	median	2.0
25.0%	quartile	-4.7
10.0%		-7.8
2.5%		-11.8
0.5%		-11.8
0.0%	minimum	-11.8

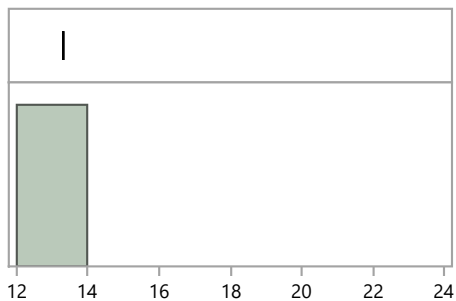
**Summary Statistics**

Mean	1.2
Std Dev	6.9
Std Err Mean	1.0
Upper 95% Mean	3.1
Lower 95% Mean	-0.7
N	53.0

**MaW Distribution by Prep Method**

**Distributions Analyte\_Method=Zinc-65 Wet ash - Acid digestion - the use of oxidizers to destroy organics**

**Bias**



Quantiles			Summary Statistics	
100.0%	maximum	13.3	Mean	13.3
99.5%		13.3	Std Dev	.
97.5%		13.3	Std Err Mean	.
90.0%		13.3	Upper 95% Mean	.
75.0%	quartile	13.3	Lower 95% Mean	.
50.0%	median	13.3	N	1.0
25.0%	quartile	13.3		
10.0%		13.3		
2.5%		13.3		
0.5%		13.3		
0.0%	minimum	13.3		