

## **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.

## MaS43 Participating Laboratories

<b>Lab Code</b>	<b>Lab Name</b>	<b>Matrix Code</b>
ADEM01	Alabama Department of Environmental Management	MaS
ADFC99	Abu Dhabi Quality and Conformity Council-Central Testing Lab	MaS
AFOH01	USAFSAM/OEA	MaS
ANTE01	ALS Environmental - Fort Collins, CO	MaS
ARGO01	Idaho National Laboratory	MaS
ARSA01	ARS Aleut Analytical, LLC (Luckey)	MaS
ARSL01	ARS Aleut Analytical, LLC	MaS
AY1201	Consolidated Nuclear Security, LLC, ACO Laboratory	MaS
BY1201	Consolidated Nuclear Security, LLC, ACO, Production Laboratory	MaS
CDHS01	California Department of Public Health	MaS
CESL01	Lawrence Livermore National Laboratory - EMRL	MaS
CMRC01	Carlsbad Environmental Monitoring and Research Center	MaS
CORE02	TestAmerica Denver	MaS
DINL99	Departamento Ingeniería Energética	MaS
EFGS01	Eurofins Frontier Global Sciences, LLC.	MaS
EMAX01	EMAX Laboratories, Inc	MaS
ERCL01	Washington State Public Health Laboratories	MaS
ERHD99	Radiation Protection Bureau Health Canada RSD NMS	MaS
ETTP01	MCLinc	MaS
EULC01	EnergySolutions, LLC	MaS
FDHE01	Florida Dept of Health Environmental Laboratory	MaS
FDOH01	Florida Dept. of Health, Mobile Environmental Radiological Lab	MaS
GENE01	GEL Laboratories, LLC	MaS
GPCL01	Georgia Power Company Environmental Laboratory	MaS
HECR01	SC Dept. Health and Environmental Control Radiological Laboratory	MaS
HPAC99	PHE, CRCE Glasgow	MaS
HPAL01	Los Alamos National Laboratory	MaS
IAEA20	IAEA Radiometrics Laboratory	MaS
IAEA99	International Atomic Energy Agency	MaS
IEMA01	Illinois Emergency Management Agency Radiochemistry Laboratory	MaS
ISUE01	ISU Environmental Monitoring Laboratory	MaS
ISUP01	ISU - Department of Physics/Health Physics/EAL	MaS
JAEC99	Research Laboratories and Information Directorate	MaS
JLNN01	Jefferson Laboratory	MaS
LANL01	Los Alamos National Laboratory	MaS
LAWR01	LAWRENCE BERKELEY NATIONAL LABORATORY	MaS
LOCK03	Advanced Test Reactor (ATR) Complex Radioanalytical Laboratory	MaS
MALA99	Alypz Sdn. Bhd.	MaS
MART01	Fluor B&W Ports Analytical Laboratory	MaS
MART03	Radioactive Material Analysis Laboratory	MaS
MDPH01	MDPH-Radiation Control Program	MaS
NESI01	BWXT-Radioisotope & Analytical Chemistry Laboratory	MaS
NJDH01	New Jersey Dept. of Health, PHEL, ECLS	MaS
NOCS99	National Oceanography Centre, Southampton	MaS

ODHL01	Ohio Department of Health Laboratory	MaS
ORIS01	ORISE/IEAV	MaS
OTLI01	Pace Analytical National Center for Testing & Innovation	MaS
QUAN02	Eurofins TestAmerica Knoxville	MaS
RAVR99	Radiactividad Ambiental y Vigilancia Radiologica	MaS
RJLG01	RJ Lee Group - Columbia Basin Analytical Laboratories (CBAL)	MaS
SEML01	SRS Environmental Monitoring Laboratory	MaS
SLAC01	SLAC DOE National Accelerator Laboratory	MaS
SOUT01	Southwest Research Institute	MaS
SRPD01	Sandia National Laboratories, Radiation Protection Sample Diagnostics	MaS
TDHL01	Texas Department of State Health Services Laboratory	MaS
TELE01	Teledyne Brown Engineering - Environmental Services	MaS
TELE02	ATI Environmental, Inc., Midwest Lab	MaS
TMAO01	EBERLINE SERVICES OAK RIDGE LABORATORY	MaS
TNUT01	St. Louis USACE FUSRAP Laboratory	MaS
UNTE01	UniTech-235	MaS
WEST04	PACE ANALYTICAL SERVICES, PITTSBURGH	MaS
WIPH01	WI, DPH, Radiation Protection Section	MaS
WIPP01	WIPP Laboratories	MaS
WSHL01	Wisconsin State Laboratory of Hygiene	MaS
YPGA01	US Army Yuma Proving Ground / Material Analysis Lab	MaS

## Laboratories Not Reporting

<b>Lab Code</b>	<b>Lab Name</b>	<b>Matrix Code</b>
AMEC99	Jacobs Clean Energy Limited - Analytical Services	MaS
MSDH01	Mississippi State Dept of Health	MaS
NARL01	National Analytical Radiation Environmental Laboratory	MaS
NARL02	USEPA - NAREL - MERL	MaS
RPSC01	Radiation Protection Service	MaS

## Study Reference Values

MAPEP-20-MaS43

Radiological Reference Date: 08/01/2020

Analyte	Ref Value	Ref Unc	Tot Mtl Ref Val	Tot Mtl Ref Unc
Inorganic			Units: (mg/kg)	
Antimony	53	3	57.7	1.2
Arsenic	16.7	0.3	16.8	0.3
Barium	275	5	740	20
Beryllium	40.5	0.8	42.2	1.0
Cadmium	9.71	0.19	9.73	0.19
Chromium	109.2	1.9	131	5
Cobalt	109.2	1.9	115	3
Copper	163	3	175	4
Lead	51.0	0.9	57.7	1.2
Mercury	0.630	0.010	0.630	0.010
Nickel	238	5	257	7
Selenium	8.03	0.17	7.94	0.16
Silver	84.9	1.7	84.9	1.7
Thallium	43.1	0.9	43.3	0.9
Uranium-235	0.0343	0.0012		
Uranium-238	10.3	0.3		
Uranium-Total	10.3	0.3		
Vanadium	153	3	226	5
Zinc	280	10	341	13

Analyte	Ref Value	Ref Unc
Radiological		
Units: (Bq/kg)		
Cesium-134	710	16
Cobalt-57	1100	30
Cobalt-60	1000	20
Iron-55	577	13
Manganese-54	610	13
Nickel-63	980	20
Plutonium-238	57.7	1.9
Plutonium-239/240	79	3
Potassium-40	622	22
Strontium-90	487	11
Uranium-234	48.1	1.6
Uranium-238	128	4
Zinc-65	470	11

## Sample Statistical Summary

MAPEP-20-MaS43

Radiological Reference Date: 08/01/2020

Analyte	T(1)	A(2)	Grand(3) Mean	Std Dev	Ref Value	Ref Unc	Acceptance Range
Inorganic							Units: (mg/kg)
Antimony	17	15	47	3	53	3	37 - 69
Arsenic	18	17	14.4	1.6	16.7	0.3	11.7 - 21.7
Barium	17	16	274	35	275	5	193 - 358
Beryllium	19	18	39.2	4.3	40.5	0.8	28.4 - 52.7
Cadmium	18	17	9.25	0.98	9.71	0.19	6.80 - 12.62
Chromium	16	16	100.8	12.3	109.2	1.9	76.4 - 142.0
Cobalt	18	18	103.7	8.5	109.2	1.9	76.4 - 142.0
Copper	18	18	160	15	163	3	114 - 212
Lead	19	18	50.8	3.5	51.0	0.9	35.7 - 66.3
Mercury	13	12	0.598	0.056	0.630	0.010	0.441 - 0.819
Nickel	18	18	226	25	238	5	167 - 309
Selenium	17	12	7.18	1.12	8.03	0.17	5.62 - 10.44
Silver	14	14	79.9	4.4	84.9	1.7	59.4 - 110.4
Technetium-99	2	2					False Positive Test
Thallium	18	16	41.4	4.7	43.1	0.9	30.2 - 56.0
Uranium-235	11	10	0.0341	0.0026	0.0343	0.0012	0.0240 - 0.0446
Uranium-238	14	14	9.8	1.1	10.3	0.3	7.2 - 13.4
Uranium-Total	15	15	9.8	1.0	10.3	0.3	7.2 - 13.4
Vanadium	17	17	142	21	153	3	107 - 199
Zinc	17	14	279	26	280	10	196 - 364

Analyte	T(1)	A(2)	Grand(3) Mean	Std Dev	Ref Value	Ref Unc	Acceptance Range
Radiological							Units: (Bq/kg)
Americium-241	35	32					False Positive Test
Cesium-134	57	53	681	74	710	16	497 - 923
Cesium-137	50	49					False Positive Test
Cobalt-57	57	53	1107	100	1100	30	770 - 1430
Cobalt-60	57	55	988	74	1000	20	700 - 1300
Iron-55	9	4			577	13	404 - 750
Manganese-54	57	55	626	49	610	13	427 - 793
Nickel-63	13	10	893	121	980	20	686 - 1274
Plutonium-238	28	24	58.6	5.3	57.7	1.9	40.4 - 75.0
Plutonium-239/240	28	24	77	6	79	3	55 - 103
Potassium-40	57	54	652	56	622	22	435 - 809
Strontium-90	27	22	433	40	487	11	341 - 633
Technetium-99	18	16					False Positive Test
Uranium-234	31	28	45.4	5.9	48.1	1.6	33.7 - 62.5
Uranium-238	32	32	123	12	128	4	90 - 166
Zinc-65	57	53	495	36	470	11	329 - 611

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

### Results Flags:

A = Result acceptable Bias <=20%

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

## Flag Summary Report

MAPEP-20-MaS43

Inorganic				
Analyte	A	W	RW	N
Antimony	13	2		2
Arsenic	11	6		1
Barium	13	3		1
Beryllium	17	1		1
Cadmium	16	1		1
Chromium	13	3		
Cobalt	18			
Copper	18			
Lead	18			1
Mercury	12			1
Nickel	17	1		
Selenium	9	3		5
Silver	14			
Thallium	15	1		2
Uranium-Total	14	1		
Uranium-235	10			1
Uranium-238	12	2		
Vanadium	13	4		
Zinc	14			3
Technetium-99	2			
Radiological				
Analyte	A	W	RW	N
Americium-241	32			6
Cesium-134	47	6		2
Cesium-137	49			7
Cobalt-57	53			4
Cobalt-60	53	2		2
Iron-55	4			5
Manganese-54	54	1		2
Nickel-63	8	2		3
Plutonium-238	24			4
Plutonium-239/240	24			4
Potassium-40	51	3		3
Strontium-90	20	2		5
Technetium-99	16			2
Uranium-234	25	3		3
Uranium-238	31	1		
Zinc-65	53			4



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

*Laboratory Results For MAPEP-20-MaS43*

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

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	53				37 - 69		
Arsenic	NR	16.7				11.7 - 21.7		
Barium	NR	275				193 - 358		
Beryllium	NR	40.5				28.4 - 52.7		
Cadmium	NR	9.71				6.80 - 12.62		
Chromium	NR	109.2				76.4 - 142.0		
Cobalt	NR	109.2				76.4 - 142.0		
Copper	NR	163				114 - 212		
Lead	NR	51.0				35.7 - 66.3		
Mercury	NR	0.630				0.441 - 0.819		
Nickel	NR	238				167 - 309		
Selenium	NR	8.03				5.62 - 10.44		
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	NR	43.1				30.2 - 56.0		
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	NR	153				107 - 199		
Zinc	NR	280				196 - 364		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR		N	(11)		False Positive Test		
Cesium-134	2120.1	710	N		198.6	497 - 923	1	N
Cesium-137	NR		N	(11)		False Positive Test		
Cobalt-57	10878	1100	N		888.9	770 - 1430	1	N
Cobalt-60	8140	1000	N		714.0	700 - 1300	1	N
Iron-55	NR	577				404 - 750		
Manganese-54	1949.9	610	N		219.7	427 - 793	1	N
Nickel-63	NR	980				686 - 1274		
Plutonium-238	NR	57.7				40.4 - 75.0		
Plutonium-239/240	NR	79				55 - 103		
Potassium-40	21460	622	N		3350.2	435 - 809	1	N
Strontium-90	NR	487				341 - 633		



Radiological						Units: (Bq/kg)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR					False Positive Test		
Uranium-234	NR	48.1				33.7 - 62.5		
Uranium-238	NR	128				90 - 166		
Zinc-65	21460	470	N		4466.0	329 - 611	1	N

*Radiological Reference Date: August 1, 2020*

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

*Laboratory Results For MAPEP-20-MaS43*

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

Radiation Lab

Abu Dhabi, - -

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	53				37 - 69		
Arsenic	NR	16.7				11.7 - 21.7		
Barium	NR	275				193 - 358		
Beryllium	NR	40.5				28.4 - 52.7		
Cadmium	NR	9.71				6.80 - 12.62		
Chromium	NR	109.2				76.4 - 142.0		
Cobalt	NR	109.2				76.4 - 142.0		
Copper	NR	163				114 - 212		
Lead	NR	51.0				35.7 - 66.3		
Mercury	NR	0.630				0.441 - 0.819		
Nickel	NR	238				167 - 309		
Selenium	NR	8.03				5.62 - 10.44		
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	NR	43.1				30.2 - 56.0		
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	NR	153				107 - 199		
Zinc	NR	280				196 - 364		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.01		A			False Positive Test	0.01	
Cesium-134	652.02	710	A		-8.2	497 - 923	11.02	N
Cesium-137	0.01		A			False Positive Test	0.01	
Cobalt-57	1080.67	1100	A		-1.8	770 - 1430	34.69	A
Cobalt-60	847.66	1000	A		-15.2	700 - 1300	22.92	A
Iron-55	NR	577				404 - 750		
Manganese-54	594.93	610	A		-2.5	427 - 793	18.65	A
Nickel-63	NR	980				686 - 1274		
Plutonium-238	NR	57.7				40.4 - 75.0		
Plutonium-239/240	NR	79				55 - 103		
Potassium-40	629.04	622	A		1.1	435 - 809	25.15	A
Strontium-90	NR	487				341 - 633		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR					False Positive Test		
Uranium-234	NR	48.1				33.7 - 62.5		
Uranium-238	NR	128				90 - 166		
Zinc-65	436.68	470	A		-7.1	329 - 611	8.93	A

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

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(28) = Not Reporting Previously Reported Analyte



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

*Laboratory Results For MAPEP-20-MaS43*

(AFOH01) USAFSAM/OEA

2510 Fifth Street, Area B

Wright-Patterson AFB, OH 45433-7913

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	53				37 - 69		
Arsenic	NR	16.7				11.7 - 21.7		
Barium	NR	275				193 - 358		
Beryllium	NR	40.5				28.4 - 52.7		
Cadmium	NR	9.71				6.80 - 12.62		
Chromium	NR	109.2				76.4 - 142.0		
Cobalt	NR	109.2				76.4 - 142.0		
Copper	NR	163				114 - 212		
Lead	NR	51.0				35.7 - 66.3		
Mercury	NR	0.630				0.441 - 0.819		
Nickel	NR	238				167 - 309		
Selenium	NR	8.03				5.62 - 10.44		
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	NR	43.1				30.2 - 56.0		
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	NR	153				107 - 199		
Zinc	NR	280				196 - 364		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.50		A			False Positive Test	0.38	
Cesium-134	698	710	A		-1.7	497 - 923	17	A
Cesium-137	-0.8		A			False Positive Test	1.2	
Cobalt-57	1139	1100	A		3.5	770 - 1430	33	A
Cobalt-60	969	1000	A		-3.1	700 - 1300	19	N
Iron-55	NR	577				404 - 750		
Manganese-54	590	610	A		-3.3	427 - 793	14	A
Nickel-63	NR	980				686 - 1274		
Plutonium-238	60.0	57.7	A		4.0	40.4 - 75.0	4.0	A
Plutonium-239/240	79.1	79	A		0.1	55 - 103	4.7	A
Potassium-40	581	622	A		-6.6	435 - 809	22	A
Strontium-90	395	487	A		-18.9	341 - 633	28	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR					False Positive Test		
Uranium-234	44.0	48.1	A		-8.5	33.7 - 62.5	3.5	A
Uranium-238	128.9	128	A		0.7	90 - 166	7.0	A
Zinc-65	457	470	A		-2.8	329 - 611	12	A

Radiological Reference Date: August 1, 2020

**Results 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

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

Laboratory Results For MAPEP-20-MaS43  
 (ANTE01) ALS Environmental - Fort Collins, CO  
 225 Commerce Drive  
 Fort Collins, CO 80524-1416

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	50.3	53	A		-5.1	37 - 69	3.522775	A
Arsenic	12.5	16.7	W		-25.2	11.7 - 21.7	1.035924	A
Barium	281	275	A		2.2	193 - 358	19.75155	A
Beryllium	38.9	40.5	A		-4.0	28.4 - 52.7	2.192085	A
Cadmium	9.38	9.71	A		-3.4	6.80 - 12.62	0.587005	A
Chromium	105	109.2	A		-3.8	76.4 - 142.0	6.008218	A
Cobalt	110	109.2	A		0.7	76.4 - 142.0	5.837055	A
Copper	176	163	A		8.0	114 - 212	11.45760	A
Lead	50	51.0	A		-2.0	35.7 - 66.3	2.758627	A
Mercury	0.628	0.630	A		-0.3	0.441 - 0.819	0.035253	A
Nickel	238	238	A		0.0	167 - 309	16.50443	A
Selenium	6.82	8.03	A		-15.1	5.62 - 10.44	0.611927	A
Silver	77.6	84.9	A		-8.6	59.4 - 110.4	6.364480	A
Technetium-99	NR					False Positive Test		
Thallium	46.1	43.1	A		7.0	30.2 - 56.0	4.576404	A
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	7.51	10.3	W		-27.1	7.2 - 13.4	0.694091	A
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	140	153	A		-8.5	107 - 199	6.823638	A
Zinc	291	280	A		3.9	196 - 364	19.85835	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	1.29		A			False Positive Test	1.29	
Cesium-134	656	710	A		-7.6	497 - 923	39	A
Cesium-137	4.1		A			False Positive Test	4.1	
Cobalt-57	1130	1100	A		2.7	770 - 1430	66	A
Cobalt-60	1010	1000	A		1.0	700 - 1300	59	A
Iron-55	685	577	A		18.7	404 - 750	85	A
Manganese-54	656	610	A		7.5	427 - 793	39	A
Nickel-63	900	980	A		-8.2	686 - 1274	120	A
Plutonium-238	60.1	57.7	A		4.2	40.4 - 75.0	5.2	A
Plutonium-239/240	76.6	79	A		-3.0	55 - 103	6.5	A
Potassium-40	664	622	A		6.8	435 - 809	43	A
Strontium-90	433	487	A		-11.1	341 - 633	51	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	4.00		A			False Positive Test	4.00	
Uranium-234	47.8	48.1	A		-0.6	33.7 - 62.5	4.1	A
Uranium-238	120	128	A		-6.3	90 - 166	10	A
Zinc-65	553	470	A		17.7	329 - 611	33	A

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

*Laboratory Results For MAPEP-20-MaS43*

(ARGO01) Idaho National Laboratory

INL, Materials and Fuels Complex

Idaho Falls, ID 83415

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	53				37 - 69		
Arsenic	NR	16.7				11.7 - 21.7		
Barium	NR	275				193 - 358		
Beryllium	NR	40.5				28.4 - 52.7		
Cadmium	NR	9.71				6.80 - 12.62		
Chromium	NR	109.2				76.4 - 142.0		
Cobalt	NR	109.2				76.4 - 142.0		
Copper	NR	163				114 - 212		
Lead	NR	51.0				35.7 - 66.3		
Mercury	NR	0.630				0.441 - 0.819		
Nickel	NR	238				167 - 309		
Selenium	NR	8.03				5.62 - 10.44		
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	NR	43.1				30.2 - 56.0		
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	NR	153				107 - 199		
Zinc	NR	280				196 - 364		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	728	710	A		2.5	497 - 923	22	A
Cesium-137	3.94			A		False Positive Test	3.94	
Cobalt-57	1147	1100	A		4.3	770 - 1430	34	A
Cobalt-60	1030	1000	A		3.0	700 - 1300	31	A
Iron-55	NR	577				404 - 750		
Manganese-54	638	610	A		4.6	427 - 793	19	A
Nickel-63	NR	980				686 - 1274		
Plutonium-238	NR	57.7				40.4 - 75.0		
Plutonium-239/240	NR	79				55 - 103		
Potassium-40	677	622	A		8.8	435 - 809	30	A
Strontium-90	NR	487				341 - 633		



Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR					False Positive Test		
Uranium-234	NR	48.1				33.7 - 62.5		
Uranium-238	NR	128				90 - 166		
Zinc-65	516	470	A		9.8	329 - 611	15	A

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

Laboratory Results For MAPEP-20-MaS43  
 (ARSA01) ARS Aleut Analytical, LLC (Luckey)  
 21200 Luckey Rd.  
 Luckey, OH 43443

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	53				37 - 69		
Arsenic	NR	16.7				11.7 - 21.7		
Barium	NR	275				193 - 358		
Beryllium	36.3	40.5	A		-10.4	28.4 - 52.7	3.0	A
Cadmium	NR	9.71				6.80 - 12.62		
Chromium	NR	109.2				76.4 - 142.0		
Cobalt	NR	109.2				76.4 - 142.0		
Copper	NR	163				114 - 212		
Lead	49.8	51.0	A		-2.4	35.7 - 66.3	4.0	A
Mercury	NR	0.630				0.441 - 0.819		
Nickel	NR	238				167 - 309		
Selenium	NR	8.03				5.62 - 10.44		
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	NR	43.1				30.2 - 56.0		
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	NR	153				107 - 199		
Zinc	NR	280				196 - 364		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	-2.758		A			False Positive Test	8.165	
Cesium-134	529.951	710	W		-25.4	497 - 923	24.396	A
Cesium-137	2.922		A			False Positive Test	9.304	
Cobalt-57	883.227	1100	A		-19.7	770 - 1430	56.684	A
Cobalt-60	814.666	1000	A		-18.5	700 - 1300	32.507	A
Iron-55	NR	577				404 - 750		
Manganese-54	551.337	610	A		-9.6	427 - 793	25.279	A
Nickel-63	NR	980				686 - 1274		
Plutonium-238	2242.866	57.7	N		3787.1	40.4 - 75.0	9196.350	N
Plutonium-239/240	-25155.19	79	N		-31942.0	55 - 103	7219.440	N
Potassium-40	641.802	622	A		3.2	435 - 809	61.968	A
Strontium-90	NR	487				341 - 633		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR					False Positive Test		
Uranium-234	54.765	48.1	A		13.9	33.7 - 62.5	15.152	W
Uranium-238	162.709	128	W		27.1	90 - 166	30.234	W
Zinc-65	518.111	470	A		10.2	329 - 611	55.926	A

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

*Laboratory Results For MAPEP-20-MaS43*

(ARSL01) ARS Aleut Analytical, LLC

2609 North River Road

Port Allen, LA 70767

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	49.5	53	A		-6.6	37 - 69	6.045	A
Arsenic	13.2	16.7	W		-21.0	11.7 - 21.7	2.013	W
Barium	252	275	A		-8.4	193 - 358	38.206	W
Beryllium	37.1	40.5	A		-8.4	28.4 - 52.7	5.794	W
Cadmium	10.4	9.71	A		7.1	6.80 - 12.62	1.653	W
Chromium	97.3	109.2	A		-10.9	76.4 - 142.0	14.614	W
Cobalt	104	109.2	A		-4.8	76.4 - 142.0	18.027	W
Copper	164	163	A		0.6	114 - 212	30.491	W
Lead	48.9	51.0	A		-4.1	35.7 - 66.3	12.020	W
Mercury	.567	0.630	A		-10.0	0.441 - 0.819	.109	W
Nickel	233	238	A		-2.1	167 - 309	40.726	W
Selenium	6.01	8.03	W		-25.2	5.62 - 10.44	.938	W
Silver	83.7	84.9	A		-1.4	59.4 - 110.4	10.025	A
Technetium-99	NR					False Positive Test		
Thallium	40.2	43.1	A		-6.7	30.2 - 56.0	7.019	W
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	9.52	10.3	A		-7.6	7.2 - 13.4	1.253	A
Vanadium	125	153	A		-18.3	107 - 199	22.039	W
Zinc	301	280	A		7.5	196 - 364	35.824	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	2.591		A			False Positive Test	1.457	
Cesium-134	616.37	710	A		-13.2	497 - 923	19.921	A
Cesium-137	-.227		A			False Positive Test	.789	
Cobalt-57	1060.5	1100	A		-3.6	770 - 1430	36.866	A
Cobalt-60	985.080	1000	A		-1.5	700 - 1300	19.792	A
Iron-55	NR	577				404 - 750		
Manganese-54	613.68	610	A		0.6	427 - 793	19.643	A
Nickel-63	NR	980				686 - 1274		
Plutonium-238	52.147	57.7	A		-9.6	40.4 - 75.0	4.795	A
Plutonium-239/240	79.360	79	A		0.5	55 - 103	6.574	A
Potassium-40	722.94	622	A		16.2	435 - 809	28.321	A
Strontium-90	2.065	487	N		-99.6	341 - 633	.168	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	17.887		A			False Positive Test	9.931	
Uranium-234	43.503	48.1	A		-9.6	33.7 - 62.5	4.339	A
Uranium-238	113.495	128	A		-11.3	90 - 166	8.780	A
Zinc-65	511.90	470	A		8.9	329 - 611	17.431	A

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

### Laboratory Results For MAPEP-20-MaS43

(AY1201) Consolidated Nuclear Security, LLC, ACO Laboratory

Y12, NSC, Bldg. 9995, Rm 142

Oak Ridge, TN 37831-8189

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	51.4	53	A		-3.0	37 - 69	2.71	A
Arsenic	16.2	16.7	A		-3.0	11.7 - 21.7	2.14	A
Barium	269	275	A		-2.2	193 - 358	10.9	A
Beryllium	38.4	40.5	A		-5.2	28.4 - 52.7	2.39	A
Cadmium	10.2	9.71	A		5.0	6.80 - 12.62	1.14	A
Chromium	102	109.2	A		-6.6	76.4 - 142.0	3.21	A
Cobalt	97.9	109.2	A		-10.3	76.4 - 142.0	4.90	A
Copper	148	163	A		-9.2	114 - 212	6.10	A
Lead	53.7	51.0	A		5.3	35.7 - 66.3	3.50	A
Mercury	0.725	0.630	A		15.1	0.441 - 0.819	0.0758	A
Nickel	218	238	A		-8.4	167 - 309	10.8	A
Selenium	12.4	8.03	N		54.4	5.62 - 10.44	2.01	W
Silver	80.4	84.9	A		-5.3	59.4 - 110.4	9.38	A
Technetium-99	NR					False Positive Test		
Thallium	41.9	43.1	A		-2.8	30.2 - 56.0	5.15	A
Uranium-235	0.036	0.0343	A		5.0	0.0240 - 0.0446	0.004	A
Uranium-238	9.91	10.3	A		-3.8	7.2 - 13.4	0.991	A
Uranium-Total	9.95	10.3	A		-3.4	7.2 - 13.4	0.995	A
Vanadium	146	153	A		-4.6	107 - 199	5.55	A
Zinc	284	280	A		1.4	196 - 364	17.8	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.459		A			False Positive Test	0.87	
Cesium-134	NR	710		(6)		497 - 923		
Cesium-137	0.30		A			False Positive Test	4.4	
Cobalt-57	1160	1100	A		5.5	770 - 1430	35	A
Cobalt-60	1090	1000	A		9.0	700 - 1300	85	A
Iron-55	NR	577				404 - 750		
Manganese-54	670	610	A		9.8	427 - 793	110	W
Nickel-63	NR	980				686 - 1274		
Plutonium-238	58.3	57.7	A		1.0	40.4 - 75.0	6.8	A
Plutonium-239/240	77.9	79	A		-1.4	55 - 103	8.5	A
Potassium-40	751	622	W		20.7	435 - 809	120	W
Strontium-90	413	487	A		-15.2	341 - 633	35	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	-35.5		A			False Positive Test	33	
Uranium-234	42.0	48.1	A		-12.7	33.7 - 62.5	4.4	A
Uranium-238	120	128	A		-6.3	90 - 166	10	A
Zinc-65	540	470	A		14.9	329 - 611	80	A

Radiological Reference Date: August 1, 2020

**Results 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

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

*Laboratory Results For MAPEP-20-MaS43*

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

Y12, NSC, Bldg. 9995, Rm 142

Oak Ridge, TN 37831-8189

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	53				37 - 69		
Arsenic	NR	16.7				11.7 - 21.7		
Barium	NR	275				193 - 358		
Beryllium	NR	40.5				28.4 - 52.7		
Cadmium	NR	9.71				6.80 - 12.62		
Chromium	NR	109.2				76.4 - 142.0		
Cobalt	NR	109.2				76.4 - 142.0		
Copper	NR	163				114 - 212		
Lead	NR	51.0				35.7 - 66.3		
Mercury	NR	0.630				0.441 - 0.819		
Nickel	NR	238				167 - 309		
Selenium	NR	8.03				5.62 - 10.44		
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	NR	43.1				30.2 - 56.0		
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	NR	153				107 - 199		
Zinc	NR	280				196 - 364		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.21		A			False Positive Test	2.51	
Cesium-134	NR	710		(6)		497 - 923		
Cesium-137	0.163		A			False Positive Test	1.31	
Cobalt-57	1140	1100	A		3.6	770 - 1430	12.57	N
Cobalt-60	963.7	1000	A		-3.6	700 - 1300	11.27	N
Iron-55	NR	577				404 - 750		
Manganese-54	650.7	610	A		6.7	427 - 793	9.16	N
Nickel-63	NR	980				686 - 1274		
Plutonium-238	61.4	57.7	A		6.4	40.4 - 75.0	8	A
Plutonium-239/240	82.1	79	A		3.9	55 - 103	10.2	A
Potassium-40	651.3	622	A		4.7	435 - 809	20.0	A
Strontium-90	402.07	487	A		-17.4	341 - 633	29.60	A



Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	1.73		A			False Positive Test	20.31	
Uranium-234	52.7	48.1	A		9.6	33.7 - 62.5	5.25	A
Uranium-238	123.0	128	A		-3.9	90 - 166	8.6	A
Zinc-65	511.3	470	A		8.8	329 - 611	10.19	N

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

Laboratory Results For MAPEP-20-MaS43  
 (CDHS01) California Department of Public Health  
 Drinking Water & Radiation Lab.  
 Richmond, CA 94804-6403

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	53				37 - 69		
Arsenic	NR	16.7				11.7 - 21.7		
Barium	NR	275				193 - 358		
Beryllium	NR	40.5				28.4 - 52.7		
Cadmium	NR	9.71				6.80 - 12.62		
Chromium	NR	109.2				76.4 - 142.0		
Cobalt	NR	109.2				76.4 - 142.0		
Copper	NR	163				114 - 212		
Lead	NR	51.0				35.7 - 66.3		
Mercury	NR	0.630				0.441 - 0.819		
Nickel	NR	238				167 - 309		
Selenium	NR	8.03				5.62 - 10.44		
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	NR	43.1				30.2 - 56.0		
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	NR	153				107 - 199		
Zinc	NR	280				196 - 364		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.560		A			False Positive Test	0.202	
Cesium-134	711	710	A		0.1	497 - 923	13.7	N
Cesium-137	0.0951		A			False Positive Test	0.470	
Cobalt-57	1061	1100	A		-3.5	770 - 1430	14.3	N
Cobalt-60	984	1000	A		-1.6	700 - 1300	11.4	N
Iron-55	355.9	577	N		-38.3	404 - 750	44.6	A
Manganese-54	631	610	A		3.4	427 - 793	10.5	N
Nickel-63	1094	980	A		11.6	686 - 1274	28.1	A
Plutonium-238	61.5	57.7	A		6.6	40.4 - 75.0	1.49	A
Plutonium-239/240	80.8	79	A		2.3	55 - 103	1.77	A
Potassium-40	672	622	A		8.0	435 - 809	15.6	A
Strontium-90	466	487	A		-4.3	341 - 633	15.4	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	47.9		N	(1)		False Positive Test	15.1	
Uranium-234	42.7	48.1	A		-11.2	33.7 - 62.5	1.52	A
Uranium-238	113	128	A		-11.7	90 - 166	2.91	A
Zinc-65	486	470	A		3.4	329 - 611	7.42	N

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

*Laboratory Results For MAPEP-20-MaS43*

(CESL01) Lawrence Livermore National Laboratory - EMRL

7000 East Avenue

Livermore, CA 94551

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	53				37 - 69		
Arsenic	NR	16.7				11.7 - 21.7		
Barium	NR	275				193 - 358		
Beryllium	NR	40.5				28.4 - 52.7		
Cadmium	NR	9.71				6.80 - 12.62		
Chromium	NR	109.2				76.4 - 142.0		
Cobalt	NR	109.2				76.4 - 142.0		
Copper	NR	163				114 - 212		
Lead	NR	51.0				35.7 - 66.3		
Mercury	NR	0.630				0.441 - 0.819		
Nickel	NR	238				167 - 309		
Selenium	NR	8.03				5.62 - 10.44		
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	NR	43.1				30.2 - 56.0		
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	NR	153				107 - 199		
Zinc	NR	280				196 - 364		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	1.29e-01		A			False Positive Test	2.93e-01	
Cesium-134	6.71e+02	710	A		-5.5	497 - 923	2.16e+01	A
Cesium-137	-5.45e+00		A			False Positive Test	1.23e+01	
Cobalt-57	1.20e+03	1100	A		9.1	770 - 1430	4.35e+01	A
Cobalt-60	1.02e+03	1000	A		2.0	700 - 1300	3.91e+01	A
Iron-55	NR	577				404 - 750		
Manganese-54	6.36e+02	610	A		4.3	427 - 793	3.41e+01	A
Nickel-63	NR	980				686 - 1274		
Plutonium-238	6.03E+01	57.7	A		4.5	40.4 - 75.0	1.27	A
Plutonium-239/240	7.78E+01	79	A		-1.5	55 - 103	1.44	N
Potassium-40	6.17e+02	622	A		-0.8	435 - 809	6.75e+01	A
Strontium-90	NR	487				341 - 633		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR					False Positive Test		
Uranium-234	NR	48.1				33.7 - 62.5		
Uranium-238	NR	128				90 - 166		
Zinc-65	4.93e+02	470	A		4.9	329 - 611	3.72e+01	A

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

*Laboratory Results For MAPEP-20-MaS43*

(CMRC01) Carlsbad Environmental Monitoring and Research Center

1400 University Dr.

Carlsbad, NM 88220

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	53				37 - 69		
Arsenic	NR	16.7				11.7 - 21.7		
Barium	NR	275				193 - 358		
Beryllium	NR	40.5				28.4 - 52.7		
Cadmium	NR	9.71				6.80 - 12.62		
Chromium	NR	109.2				76.4 - 142.0		
Cobalt	NR	109.2				76.4 - 142.0		
Copper	NR	163				114 - 212		
Lead	NR	51.0				35.7 - 66.3		
Mercury	NR	0.630				0.441 - 0.819		
Nickel	NR	238				167 - 309		
Selenium	NR	8.03				5.62 - 10.44		
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	NR	43.1				30.2 - 56.0		
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	NR	153				107 - 199		
Zinc	NR	280				196 - 364		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	2.02E-01		A			False Positive Test	1.91E-01	
Cesium-134	7.47E+02	710	A		5.2	497 - 923	6.73	N
Cesium-137	9.08E-01		N	(1)		False Positive Test	2.77E-01	
Cobalt-57	1.26E+03	1100	A		14.5	770 - 1430	7.73	A
Cobalt-60	1.07E+03	1000	A		7.0	700 - 1300	2.14	A
Iron-55	NR	577				404 - 750		
Manganese-54	6.99E+02	610	A		14.6	427 - 793	1.44	A
Nickel-63	NR	980				686 - 1274		
Plutonium-238	6.61E+01	57.7	A		14.6	40.4 - 75.0	4.89	A
Plutonium-239/240	8.10E+01	79	A		2.5	55 - 103	5.97	A
Potassium-40	7.20E+02	622	A		15.8	435 - 809	1.47	A
Strontium-90	NR	487				341 - 633		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR					False Positive Test		
Uranium-234	4.77E+01	48.1	A		-0.8	33.7 - 62.5	3.66	A
Uranium-238	1.39E+02	128	A		8.6	90 - 166	1.02	A
Zinc-65	5.43E+02	470	A		15.5	329 - 611	1.18	A

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

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(28) = Not Reporting Previously Reported Analyte



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

Laboratory Results For MAPEP-20-MaS43

(CORE02) TestAmerica Denver

4955 Yarrow St

Arvada, CO 80002

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	47.3	53	A		-10.8	37 - 69	0.00369	N
Arsenic	12.9	16.7	W		-22.8	11.7 - 21.7	0.90	A
Barium	215	275	W		-21.8	193 - 358	7.17	A
Beryllium	34.5	40.5	A		-14.8	28.4 - 52.7	1.34	A
Cadmium	8.13	9.71	A		-16.3	6.80 - 12.62	0.544	A
Chromium	89.7	109.2	A		-17.9	76.4 - 142.0	3.85	A
Cobalt	94.9	109.2	A		-13.1	76.4 - 142.0	4.95	A
Copper	140	163	A		-14.1	114 - 212	6.31	A
Lead	44.1	51.0	A		-13.5	35.7 - 66.3	1.52	A
Mercury	0.541	0.630	A		-14.1	0.441 - 0.819	0.009	N
Nickel	203	238	A		-14.7	167 - 309	15.8	A
Selenium	5.28	8.03	N		-34.2	5.62 - 10.44	0.398	A
Silver	72.3	84.9	A		-14.8	59.4 - 110.4	3.852	A
Technetium-99	NR					False Positive Test		
Thallium	37.3	43.1	A		-13.5	30.2 - 56.0	4.127	A
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	8.42	10.3	A		-18.3	7.2 - 13.4	0.176	A
Vanadium	118	153	W		-22.9	107 - 199	7.77	A
Zinc	255	280	A		-8.9	196 - 364	24.83	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	NR	710				497 - 923		
Cesium-137	NR					False Positive Test		
Cobalt-57	NR	1100				770 - 1430		
Cobalt-60	NR	1000				700 - 1300		
Iron-55	NR	577				404 - 750		
Manganese-54	NR	610				427 - 793		
Nickel-63	NR	980				686 - 1274		
Plutonium-238	NR	57.7				40.4 - 75.0		
Plutonium-239/240	NR	79				55 - 103		
Potassium-40	NR	622				435 - 809		
Strontium-90	NR	487				341 - 633		



Radiological						Units: (Bq/kg)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR					False Positive Test		
Uranium-234	NR	48.1				33.7 - 62.5		
Uranium-238	NR	128				90 - 166		
Zinc-65	NR	470				329 - 611		

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

Laboratory Results For MAPEP-20-MaS43  
 (DINL99) Departamento Ingeniería Energética  
 Escuela de Ingeniería de Bilbao  
 Bilbao, Vizcaya 48013

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	53				37 - 69		
Arsenic	NR	16.7				11.7 - 21.7		
Barium	NR	275				193 - 358		
Beryllium	NR	40.5				28.4 - 52.7		
Cadmium	NR	9.71				6.80 - 12.62		
Chromium	NR	109.2				76.4 - 142.0		
Cobalt	NR	109.2				76.4 - 142.0		
Copper	NR	163				114 - 212		
Lead	NR	51.0				35.7 - 66.3		
Mercury	NR	0.630				0.441 - 0.819		
Nickel	NR	238				167 - 309		
Selenium	NR	8.03				5.62 - 10.44		
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	NR	43.1				30.2 - 56.0		
Uranium-235	0.04524	0.0343	N		31.9	0.0240 - 0.0446	0.004253	A
Uranium-238	9.822	10.3	A		-4.6	7.2 - 13.4	0.4174	A
Uranium-Total	9.822	10.3	A		-4.6	7.2 - 13.4	0.4174	A
Vanadium	NR	153				107 - 199		
Zinc	NR	280				196 - 364		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.4701		N	(1)		False Positive Test	0.05135	
Cesium-134	670.8	710	A		-5.5	497 - 923	34.47	A
Cesium-137	1.634		A			False Positive Test	1.634	
Cobalt-57	1002	1100	A		-8.9	770 - 1430	51.70	A
Cobalt-60	955.5	1000	A		-4.5	700 - 1300	49.06	A
Iron-55	575.3	577	A		-0.3	404 - 750	18.80	A
Manganese-54	581.1	610	A		-4.7	427 - 793	29.88	A
Nickel-63	997.2	980	A		1.8	686 - 1274	20.60	A
Plutonium-238	58.15	57.7	A		0.8	40.4 - 75.0	2.303	A
Plutonium-239/240	76.04	79	A		-3.7	55 - 103	2.987	A
Potassium-40	597.2	622	A		-4.0	435 - 809	31.76	A
Strontium-90	446.3	487	A		-8.4	341 - 633	19.84	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	5.62		A			False Positive Test	5.62	
Uranium-234	44.76	48.1	A		-6.9	33.7 - 62.5	2.057	A
Uranium-238	122.2	128	A		-4.5	90 - 166	5.192	A
Zinc-65	456.2	470	A		-2.9	329 - 611	23.52	A

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

Laboratory Results For MAPEP-20-MaS43  
 (EFGS01) Eurofins Frontier Global Sciences, LLC.  
 5755 8th St. E  
 Tacoma, WA 98424

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	53				37 - 69		
Arsenic	NR	16.7				11.7 - 21.7		
Barium	NR	275				193 - 358		
Beryllium	NR	40.5				28.4 - 52.7		
Cadmium	NR	9.71				6.80 - 12.62		
Chromium	NR	109.2				76.4 - 142.0		
Cobalt	NR	109.2				76.4 - 142.0		
Copper	NR	163				114 - 212		
Lead	NR	51.0				35.7 - 66.3		
Mercury	0.611	0.630	A		-3.0	0.441 - 0.819	0.0466	A
Nickel	NR	238				167 - 309		
Selenium	NR	8.03				5.62 - 10.44		
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	NR	43.1				30.2 - 56.0		
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	NR	153				107 - 199		
Zinc	NR	280				196 - 364		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	NR	710				497 - 923		
Cesium-137	NR					False Positive Test		
Cobalt-57	NR	1100				770 - 1430		
Cobalt-60	NR	1000				700 - 1300		
Iron-55	NR	577				404 - 750		
Manganese-54	NR	610				427 - 793		
Nickel-63	NR	980				686 - 1274		
Plutonium-238	NR	57.7				40.4 - 75.0		
Plutonium-239/240	NR	79				55 - 103		
Potassium-40	NR	622				435 - 809		
Strontium-90	NR	487				341 - 633		

Radiological						Units: (Bq/kg)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR					False Positive Test		
Uranium-234	NR	48.1				33.7 - 62.5		
Uranium-238	NR	128				90 - 166		
Zinc-65	NR	470				329 - 611		

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

*Laboratory Results For MAPEP-20-MaS43*

(EMAX01) EMAX Laboratories, Inc

1835 W. 205th St.

Torrance, CA 90501

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	46.5	53	A		-12.3	37 - 69	0.172	N
Arsenic	14.9	16.7	A		-10.8	11.7 - 21.7	0.646	A
Barium	301	275	A		9.5	193 - 358	2.32	N
Beryllium	39	40.5	A		-3.7	28.4 - 52.7	0.039	N
Cadmium	9	9.71	A		-7.3	6.80 - 12.62	0.017	N
Chromium	101	109.2	A		-7.5	76.4 - 142.0	0.037	N
Cobalt	110	109.2	A		0.7	76.4 - 142.0	0.32	N
Copper	159	163	A		-2.5	114 - 212	1.5	N
Lead	51.1	51.0	A		0.2	35.7 - 66.3	0.054	N
Mercury	0.59	0.630	A		-6.3	0.441 - 0.819	0.0263	A
Nickel	243	238	A		2.1	167 - 309	0.5	N
Selenium	6.56	8.03	A		-18.3	5.62 - 10.44	0.293	A
Silver	78	84.9	A		-8.1	59.4 - 110.4	0.159	N
Technetium-99	NR					False Positive Test		
Thallium	37.8	43.1	A		-12.3	30.2 - 56.0	0.387	N
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	9.29	10.3	A		-9.8	7.2 - 13.4	0.032	N
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	150	153	A		-2.0	107 - 199	0.33	N
Zinc	312	280	A		11.4	196 - 364	0.27	N

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	NR	710				497 - 923		
Cesium-137	NR					False Positive Test		
Cobalt-57	NR	1100				770 - 1430		
Cobalt-60	NR	1000				700 - 1300		
Iron-55	NR	577				404 - 750		
Manganese-54	NR	610				427 - 793		
Nickel-63	NR	980				686 - 1274		
Plutonium-238	NR	57.7				40.4 - 75.0		
Plutonium-239/240	NR	79				55 - 103		
Potassium-40	NR	622				435 - 809		
Strontium-90	NR	487				341 - 633		

Radiological						Units: (Bq/kg)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR					False Positive Test		
Uranium-234	NR	48.1				33.7 - 62.5		
Uranium-238	NR	128				90 - 166		
Zinc-65	NR	470				329 - 611		

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

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(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

Laboratory Results For MAPEP-20-MaS43  
 (ERCL01) Washington State Public Health Laboratories  
 1610 N.E. 150th Street  
 Shoreline, WA 98155-9701

Inorganic								Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag	
Antimony	60.6	57.7	A	(5)	5.0	40 - 75	2.0	A	
Arsenic	15.0	16.8	A	(5)	-10.7	11.8 - 21.8	2.4	W	
Barium	NR	275				193 - 358			
Beryllium	40.2	42.2	A	(5)	-4.7	29.5 - 54.9	1.7	A	
Cadmium	9.97	9.73	A	(5)	2.5	6.81 - 12.65	0.37	A	
Chromium	NR	109.2				76.4 - 142.0			
Cobalt	105	115	A	(5)	-8.7	80.5 - 149.5	4	A	
Copper	165	175	A	(5)	-5.7	123 - 228	6	A	
Lead	57.2	57.7	A	(5)	-0.9	40.4 - 75.0	1.6	A	
Mercury	NR	0.630				0.441 - 0.819			
Nickel	234	257	A	(5)	-8.9	180 - 334	8	A	
Selenium	9.2	7.94	A	(5)	15.9	5.56 - 10.32	2.4	W	
Silver	NR	84.9				59.4 - 110.4			
Technetium-99	NR					False Positive Test			
Thallium	42.8	43.3	A	(5)	-1.2	30.3 - 56.3	1.3	A	
Uranium-235	0.0375	0.0343	A		9.3	0.0240 - 0.0446	0.0015	A	
Uranium-238	11.0	10.3	A		6.8	7.2 - 13.4	0.4	A	
Uranium-Total	11.1	10.3	A		7.8	7.2 - 13.4	0.4	A	
Vanadium	NR	153				107 - 199			
Zinc	NR	280				196 - 364			

Radiological								Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag	
Americium-241	0.85		A			False Positive Test	0.34		
Cesium-134	670	710	A		-5.6	497 - 923	8	N	
Cesium-137	0.89		A			False Positive Test	0.60		
Cobalt-57	1110	1100	A		0.9	770 - 1430	10	N	
Cobalt-60	1060	1000	A		6.0	700 - 1300	10	N	
Iron-55	NR	577				404 - 750			
Manganese-54	633	610	A		3.8	427 - 793	26	A	
Nickel-63	830	980	A		-15.3	686 - 1274	130	W	
Plutonium-238	61.8	57.7	A		7.1	40.4 - 75.0	2.6	A	
Plutonium-239/240	78.1	79	A		-1.1	55 - 103	3.2	A	
Potassium-40	736	622	A		18.3	435 - 809	11	N	
Strontium-90	699	487	N		43.5	341 - 633	28	A	



Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	-0.5		A			False Positive Test	1.8	
Uranium-234	40.3	48.1	A		-16.2	33.7 - 62.5	2.4	A
Uranium-238	120	128	A		-6.3	90 - 166	5	A
Zinc-65	470	470	A		0.0	329 - 611	6	N

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

*Laboratory Results For MAPEP-20-MaS43*

(ERHD99) Radiation Protection Bureau Health Canada RSD NMS

775 Brookfield Road AL6302D1

Ottawa, Ontario K1A 1C1

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	0.286	53	N		-99.5	37 - 69	0.11	N
Arsenic	16.425	16.7	A		-1.6	11.7 - 21.7	0.922	A
Barium	365.83	275	N		33.0	193 - 358	1.78	N
Beryllium	50.36	40.5	W		24.3	28.4 - 52.7	3.6	A
Cadmium	11.45	9.71	A		17.9	6.80 - 12.62	.08	N
Chromium	135.37	109.2	W		24.0	76.4 - 142.0	1.98	N
Cobalt	121.43	109.2	A		11.2	76.4 - 142.0	1.5	N
Copper	194.36	163	A		19.2	114 - 212	1.5	N
Lead	67.12	51.0	N		31.6	35.7 - 66.3	.4	N
Mercury	NR	0.630				0.441 - 0.819		
Nickel	294.5	238	W		23.7	167 - 309	8.5	A
Selenium	8.61	8.03	A		7.2	5.62 - 10.44	3.4	N
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	53.09	43.1	W		23.2	30.2 - 56.0	0.36	N
Uranium-235	0.0303	0.0343	A		-11.7	0.0240 - 0.0446	0.00001	N
Uranium-238	9.615	10.3	A		-6.7	7.2 - 13.4	.001	N
Uranium-Total	9.65	10.3	A		-6.3	7.2 - 13.4	0.001	N
Vanadium	169.4	153	A		10.7	107 - 199	1.25	N
Zinc	375.8	280	N		34.2	196 - 364	4.7	N

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.161		N	(1)		False Positive Test	0.032	
Cesium-134	870	710	W		22.5	497 - 923	32	A
Cesium-137	0.81		A			False Positive Test	0.92	
Cobalt-57	1269	1100	A		15.4	770 - 1430	50	A
Cobalt-60	1093	1000	A		9.3	700 - 1300	44	A
Iron-55	NR	577				404 - 750		
Manganese-54	671	610	A		10.0	427 - 793	24	A
Nickel-63	NR	980				686 - 1274		
Plutonium-238	0.798	57.7	N		-98.6	40.4 - 75.0	0.071	A
Plutonium-239/240	1.280	79	N		-98.4	55 - 103	0.291	W
Potassium-40	770	622	W		23.8	435 - 809	39	A
Strontium-90	468.34	487	A		-3.8	341 - 633	18.50	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR					False Positive Test		
Uranium-234	35.46	48.1	W		-26.3	33.7 - 62.5	2.34	A
Uranium-238	111.97	128	A		-12.5	90 - 166	4.21	A
Zinc-65	527	470	A		12.1	329 - 611	21	A

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

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(28) = Not Reporting Previously Reported Analyte



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

Laboratory Results For MAPEP-20-MaS43

(ETTP01) MCLinc

161 Mitchell Road

Oak Ridge, Tennessee 37830

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	42.13	53	W		-20.5	37 - 69	2.11	A
Arsenic	12.89	16.7	W		-22.8	11.7 - 21.7	1.18	A
Barium	317.5	275	A		15.5	193 - 358	19.6	A
Beryllium	38.38	40.5	A		-5.2	28.4 - 52.7	1.25	A
Cadmium	8.647	9.71	A		-10.9	6.80 - 12.62	0.384	A
Chromium	96.51	109.2	A		-11.6	76.4 - 142.0	6.14	A
Cobalt	102.8	109.2	A		-5.9	76.4 - 142.0	11.6	A
Copper	154.7	163	A		-5.1	114 - 212	9.0	A
Lead	54.63	51.0	A		7.1	35.7 - 66.3	7.10	A
Mercury	0.4383	0.630	N		-30.4	0.441 - 0.819	0.024	A
Nickel	210.3	238	A		-11.6	167 - 309	7.0	A
Selenium	6.21	8.03	W		-22.7	5.62 - 10.44	0.59	A
Silver	85.24	84.9	A		0.4	59.4 - 110.4	4.79	A
Technetium-99	0.0000033		A			False Positive Test	0.000001	
Thallium	9.971	43.1	N		-76.9	30.2 - 56.0	0.497	A
Uranium-235	0.0358	0.0343	A		4.4	0.0240 - 0.0446	0.0018	A
Uranium-238	11.094	10.3	A		7.7	7.2 - 13.4	0.555	A
Uranium-Total	11.1298	10.3	A		8.1	7.2 - 13.4	0.556	A
Vanadium	132.1	153	A		-13.7	107 - 199	8.0	A
Zinc	281.3	280	A		0.5	196 - 364	17.7	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	NR	710				497 - 923		
Cesium-137	NR					False Positive Test		
Cobalt-57	NR	1100				770 - 1430		
Cobalt-60	NR	1000				700 - 1300		
Iron-55	NR	577				404 - 750		
Manganese-54	NR	610				427 - 793		
Nickel-63	NR	980				686 - 1274		
Plutonium-238	NR	57.7				40.4 - 75.0		
Plutonium-239/240	NR	79				55 - 103		
Potassium-40	NR	622				435 - 809		
Strontium-90	NR	487				341 - 633		

Radiological						Units: (Bq/kg)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	4.8		A			False Positive Test	2.4	
Uranium-234	NR	48.1				33.7 - 62.5		
Uranium-238	NR	128				90 - 166		
Zinc-65	NR	470				329 - 611		

Radiological Reference Date: August 1, 2020

**Results 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

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

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(28) = Not Reporting Previously Reported Analyte



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

*Laboratory Results For MAPEP-20-MaS43*

(EULC01) EnergySolutions, LLC

I-80, Exit 49

Clive, UT 84029

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	53				37 - 69		
Arsenic	NR	16.7				11.7 - 21.7		
Barium	NR	275				193 - 358		
Beryllium	NR	40.5				28.4 - 52.7		
Cadmium	NR	9.71				6.80 - 12.62		
Chromium	NR	109.2				76.4 - 142.0		
Cobalt	NR	109.2				76.4 - 142.0		
Copper	NR	163				114 - 212		
Lead	NR	51.0				35.7 - 66.3		
Mercury	NR	0.630				0.441 - 0.819		
Nickel	NR	238				167 - 309		
Selenium	NR	8.03				5.62 - 10.44		
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	NR	43.1				30.2 - 56.0		
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	NR	153				107 - 199		
Zinc	NR	280				196 - 364		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	-52.614		A			False Positive Test	45.2	
Cesium-134	683.02	710	A		-3.8	497 - 923	39.81	A
Cesium-137	1.123		A			False Positive Test	.892	
Cobalt-57	1237.28	1100	A		12.5	770 - 1430	178.27	A
Cobalt-60	984.2	1000	A		-1.6	700 - 1300	58.46	A
Iron-55	NR	577				404 - 750		
Manganese-54	644.54	610	A		5.7	427 - 793	68.6	A
Nickel-63	NR	980				686 - 1274		
Plutonium-238	NR	57.7				40.4 - 75.0		
Plutonium-239/240	NR	79				55 - 103		
Potassium-40	644.54	622	A		3.6	435 - 809	83.99	A
Strontium-90	NR	487				341 - 633		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR					False Positive Test		
Uranium-234	NR	48.1				33.7 - 62.5		
Uranium-238	NR	128				90 - 166		
Zinc-65	491.36	470	A		4.5	329 - 611	48.69	A

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

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

*Laboratory Results For MAPEP-20-MaS43*

(FDHE01) Florida Dept of Health Environmental Laboratory

PO Box 680069

Orlando, FL 32868-0069

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	53				37 - 69		
Arsenic	NR	16.7				11.7 - 21.7		
Barium	NR	275				193 - 358		
Beryllium	NR	40.5				28.4 - 52.7		
Cadmium	NR	9.71				6.80 - 12.62		
Chromium	NR	109.2				76.4 - 142.0		
Cobalt	NR	109.2				76.4 - 142.0		
Copper	NR	163				114 - 212		
Lead	NR	51.0				35.7 - 66.3		
Mercury	NR	0.630				0.441 - 0.819		
Nickel	NR	238				167 - 309		
Selenium	NR	8.03				5.62 - 10.44		
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	NR	43.1				30.2 - 56.0		
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	NR	153				107 - 199		
Zinc	NR	280				196 - 364		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	-1.90		A			False Positive Test	4.29	
Cesium-134	682.26	710	A		-3.9	497 - 923	15.92	A
Cesium-137	0.80		A			False Positive Test	2.52	
Cobalt-57	936.42	1100	A		-14.9	770 - 1430	23.49	A
Cobalt-60	925.00	1000	A		-7.5	700 - 1300	16.28	N
Iron-55	NR	577				404 - 750		
Manganese-54	579.44	610	A		-5.0	427 - 793	19.22	A
Nickel-63	NR	980				686 - 1274		
Plutonium-238	66.27	57.7	A		14.9	40.4 - 75.0	4.93	A
Plutonium-239/240	70.34	79	A		-11.0	55 - 103	4.42	A
Potassium-40	573.94	622	A		-7.7	435 - 809	27.47	A
Strontium-90	306.165	487	N		-37.1	341 - 633	18.0875	A



Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR					False Positive Test		
Uranium-234	39.82	48.1	A		-17.2	33.7 - 62.5	4.36	A
Uranium-238	115.57	128	A		-9.7	90 - 166	7.49	A
Zinc-65	448.06	470	A		-4.7	329 - 611	15.39	A

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

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(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

*Laboratory Results For MAPEP-20-MaS43*

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

PO Box 680069

Orlando, FL 32868-0069

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	53				37 - 69		
Arsenic	NR	16.7				11.7 - 21.7		
Barium	NR	275				193 - 358		
Beryllium	NR	40.5				28.4 - 52.7		
Cadmium	NR	9.71				6.80 - 12.62		
Chromium	NR	109.2				76.4 - 142.0		
Cobalt	NR	109.2				76.4 - 142.0		
Copper	NR	163				114 - 212		
Lead	NR	51.0				35.7 - 66.3		
Mercury	NR	0.630				0.441 - 0.819		
Nickel	NR	238				167 - 309		
Selenium	NR	8.03				5.62 - 10.44		
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	NR	43.1				30.2 - 56.0		
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	NR	153				107 - 199		
Zinc	NR	280				196 - 364		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.35		A			False Positive Test	1.9	
Cesium-134	698.02	710	A		-1.7	497 - 923	8.35	N
Cesium-137	0.32		A			False Positive Test	3.37	
Cobalt-57	939.49	1100	A		-14.6	770 - 1430	13.43	N
Cobalt-60	907.06	1000	A		-9.3	700 - 1300	12.29	N
Iron-55	NR	577				404 - 750		
Manganese-54	569.95	610	A		-6.6	427 - 793	9.5	N
Nickel-63	NR	980				686 - 1274		
Plutonium-238	NR	57.7				40.4 - 75.0		
Plutonium-239/240	NR	79				55 - 103		
Potassium-40	609.53	622	A		-2.0	435 - 809	14.61	A
Strontium-90	NR	487				341 - 633		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR					False Positive Test		
Uranium-234	NR	48.1				33.7 - 62.5		
Uranium-238	146.43	128	A		14.4	90 - 166	7.26	A
Zinc-65	468.09	470	A		-0.4	329 - 611	9.63	A

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

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(28) = Not Reporting Previously Reported Analyte



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

Laboratory Results For MAPEP-20-MaS43

(GENE01) GEL Laboratories, LLC

2040 Savage Road

Charleston, SC 29407

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	46.6	53	A		-12.1	37 - 69	3.11	A
Arsenic	14.8	16.7	A		-11.4	11.7 - 21.7	1.00	A
Barium	252	275	A		-8.4	193 - 358	16.8	A
Beryllium	34.4	40.5	A		-15.1	28.4 - 52.7	2.29	A
Cadmium	8.22	9.71	A		-15.3	6.80 - 12.62	0.554	A
Chromium	93.0	109.2	A		-14.8	76.4 - 142.0	6.20	A
Cobalt	98.6	109.2	A		-9.7	76.4 - 142.0	6.57	A
Copper	152	163	A		-6.7	114 - 212	10.1	A
Lead	48.5	51.0	A		-4.9	35.7 - 66.3	3.24	A
Mercury	0.605	0.630	A		-4.0	0.441 - 0.819	0.0405	A
Nickel	200	238	A		-16.0	167 - 309	13.4	A
Selenium	11.5	8.03	N		43.2	5.62 - 10.44	0.774	A
Silver	75.4	84.9	A		-11.2	59.4 - 110.4	5.03	A
Technetium-99	0.0000171		A			False Positive Test	7.06E-6	
Thallium	44.7	43.1	A		3.7	30.2 - 56.0	3.01	A
Uranium-235	0.0327	0.0343	A		-4.7	0.0240 - 0.0446	0.00119	A
Uranium-238	9.65	10.3	A		-6.3	7.2 - 13.4	0.110	N
Uranium-Total	9.68	10.3	A		-6.0	7.2 - 13.4	0.111	N
Vanadium	133	153	A		-13.1	107 - 199	8.89	A
Zinc	257	280	A		-8.2	196 - 364	17.2	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	1.15		A			False Positive Test	0.474	
Cesium-134	625	710	A		-12.0	497 - 923	30.2	A
Cesium-137	0.87		A			False Positive Test	0.584	
Cobalt-57	1260	1100	A		14.5	770 - 1430	55.5	A
Cobalt-60	998	1000	A		-0.2	700 - 1300	51.3	A
Iron-55	811	577	N		40.6	404 - 750	222	W
Manganese-54	661	610	A		8.4	427 - 793	32.9	A
Nickel-63	840	980	A		-14.3	686 - 1274	91.7	A
Plutonium-238	53.1	57.7	A		-8.0	40.4 - 75.0	3.53	A
Plutonium-239/240	68.1	79	A		-13.8	55 - 103	4.17	A
Potassium-40	704	622	A		13.2	435 - 809	38	A
Strontium-90	434	487	A		-10.9	341 - 633	40.6	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	5.23		A			False Positive Test	34.5	
Uranium-234	51.3	48.1	A		6.7	33.7 - 62.5	4.31	A
Uranium-238	126	128	A		-1.6	90 - 166	8.4	A
Zinc-65	531	470	A		13.0	329 - 611	23.7	A

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

*Laboratory Results For MAPEP-20-MaS43*

(GPCL01) Georgia Power Company Environmental Laboratory

2480 Maner Road

Atlanta, GA 30339

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	53				37 - 69		
Arsenic	NR	16.7				11.7 - 21.7		
Barium	NR	275				193 - 358		
Beryllium	NR	40.5				28.4 - 52.7		
Cadmium	NR	9.71				6.80 - 12.62		
Chromium	NR	109.2				76.4 - 142.0		
Cobalt	NR	109.2				76.4 - 142.0		
Copper	NR	163				114 - 212		
Lead	NR	51.0				35.7 - 66.3		
Mercury	NR	0.630				0.441 - 0.819		
Nickel	NR	238				167 - 309		
Selenium	NR	8.03				5.62 - 10.44		
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	NR	43.1				30.2 - 56.0		
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	NR	153				107 - 199		
Zinc	NR	280				196 - 364		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	698.02	710	A		-1.7	497 - 923	44.77	A
Cesium-137	1.05		A			False Positive Test	3.59	
Cobalt-57	1002.49	1100	A		-8.9	770 - 1430	87.53	A
Cobalt-60	940.47	1000	A		-6.0	700 - 1300	64.94	A
Iron-55	NR	577				404 - 750		
Manganese-54	604.71	610	A		-0.9	427 - 793	43.69	A
Nickel-63	NR	980				686 - 1274		
Plutonium-238	NR	57.7				40.4 - 75.0		
Plutonium-239/240	NR	79				55 - 103		
Potassium-40	659.59	622	A		6.0	435 - 809	52.12	A
Strontium-90	NR	487				341 - 633		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR					False Positive Test		
Uranium-234	NR	48.1				33.7 - 62.5		
Uranium-238	NR	128				90 - 166		
Zinc-65	486.70	470	A		3.6	329 - 611	35.71	A

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

*Laboratory Results For MAPEP-20-MaS43*

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

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	53				37 - 69		
Arsenic	NR	16.7				11.7 - 21.7		
Barium	NR	275				193 - 358		
Beryllium	NR	40.5				28.4 - 52.7		
Cadmium	NR	9.71				6.80 - 12.62		
Chromium	NR	109.2				76.4 - 142.0		
Cobalt	NR	109.2				76.4 - 142.0		
Copper	NR	163				114 - 212		
Lead	NR	51.0				35.7 - 66.3		
Mercury	NR	0.630				0.441 - 0.819		
Nickel	NR	238				167 - 309		
Selenium	NR	8.03				5.62 - 10.44		
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	NR	43.1				30.2 - 56.0		
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	NR	153				107 - 199		
Zinc	NR	280				196 - 364		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	647.4	710	A		-8.8	497 - 923	26.76	A
Cesium-137	1.221		A			False Positive Test	2.929	
Cobalt-57	1040	1100	A		-5.5	770 - 1430	56.29	A
Cobalt-60	968.5	1000	A		-3.2	700 - 1300	57.28	A
Iron-55	NR	577				404 - 750		
Manganese-54	613.4	610	A		0.6	427 - 793	58.99	A
Nickel-63	NR	980				686 - 1274		
Plutonium-238	NR	57.7				40.4 - 75.0		
Plutonium-239/240	NR	79				55 - 103		
Potassium-40	649.8	622	A		4.5	435 - 809	56.88	A
Strontium-90	NR	487				341 - 633		



Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR					False Positive Test		
Uranium-234	NR	48.1				33.7 - 62.5		
Uranium-238	NR	128				90 - 166		
Zinc-65	500.0	470	A		6.4	329 - 611	44.64	A

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

## Laboratory Results For MAPEP-20-MaS43

(HPAC99) PHE, CRCE Glasgow

155 Hardgate Road

Glasgow, Scotland G514LS

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	53				37 - 69		
Arsenic	14.47	16.7	A		-13.4	11.7 - 21.7	0.8	A
Barium	286	275	A		4.0	193 - 358	36	A
Beryllium	41.4	40.5	A		2.2	28.4 - 52.7	4.1	A
Cadmium	9.78	9.71	A		0.7	6.80 - 12.62	0.64	A
Chromium	104	109.2	A		-4.8	76.4 - 142.0	13	A
Cobalt	106.3	109.2	A		-2.7	76.4 - 142.0	5.8	A
Copper	160	163	A		-1.8	114 - 212	10	A
Lead	51.1	51.0	A		0.2	35.7 - 66.3	2.8	A
Mercury	0.596	0.630	A		-5.4	0.441 - 0.819	0.06	A
Nickel	231	238	A		-2.9	167 - 309	17	A
Selenium	NR	8.03				5.62 - 10.44		
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	40.8	43.1	A		-5.3	30.2 - 56.0	2.4	A
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	138	153	A		-9.8	107 - 199	12	A
Zinc	281	280	A		0.4	196 - 364	24	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR		N	(11)		False Positive Test		
Cesium-134	745	710	A		4.9	497 - 923	34	A
Cesium-137	NR		N	(11)		False Positive Test		
Cobalt-57	1130	1100	A		2.7	770 - 1430	55	A
Cobalt-60	1072	1000	A		7.2	700 - 1300	49	A
Iron-55	NR	577				404 - 750		
Manganese-54	652	610	A		6.9	427 - 793	30	A
Nickel-63	NR	980				686 - 1274		
Plutonium-238	0.73	57.7	N		-98.7	40.4 - 75.0	0.18	W
Plutonium-239/240	0.89	79	N		-98.9	55 - 103	0.19	W
Potassium-40	649	622	A		4.3	435 - 809	32	A
Strontium-90	398	487	A		-18.3	341 - 633	24	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR					False Positive Test		
Uranium-234	36	48.1	W		-25.2	33.7 - 62.5	3.1	A
Uranium-238	108.1	128	A		-15.5	90 - 166	7.2	A
Zinc-65	517	470	A		10.0	329 - 611	24	A

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

Laboratory Results For MAPEP-20-MaS43  
 (HPAL01) Los Alamos National Laboratory  
 Milan Gadd, MS G761  
 Los Alamos, NM 87545-1663

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	53				37 - 69		
Arsenic	NR	16.7				11.7 - 21.7		
Barium	NR	275				193 - 358		
Beryllium	NR	40.5				28.4 - 52.7		
Cadmium	NR	9.71				6.80 - 12.62		
Chromium	NR	109.2				76.4 - 142.0		
Cobalt	NR	109.2				76.4 - 142.0		
Copper	NR	163				114 - 212		
Lead	NR	51.0				35.7 - 66.3		
Mercury	NR	0.630				0.441 - 0.819		
Nickel	NR	238				167 - 309		
Selenium	NR	8.03				5.62 - 10.44		
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	NR	43.1				30.2 - 56.0		
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	NR	153				107 - 199		
Zinc	NR	280				196 - 364		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	-2.87		A			False Positive Test	2.95	
Cesium-134	652.42	710	A		-8.1	497 - 923	25.77	A
Cesium-137	-0.28		A			False Positive Test	4.18	
Cobalt-57	1105.83	1100	A		0.5	770 - 1430	62.82	A
Cobalt-60	951.00	1000	A		-4.9	700 - 1300	32.75	A
Iron-55	NR	577				404 - 750		
Manganese-54	624.92	610	A		2.4	427 - 793	25.69	A
Nickel-63	NR	980				686 - 1274		
Plutonium-238	NR	57.7				40.4 - 75.0		
Plutonium-239/240	NR	79				55 - 103		
Potassium-40	635.42	622	A		2.2	435 - 809	45.87	A
Strontium-90	NR	487				341 - 633		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR					False Positive Test		
Uranium-234	-789.76	48.1	N		-1741.9	33.7 - 62.5	1048.12	N
Uranium-238	143.73	128	A		12.3	90 - 166	15.54	A
Zinc-65	512.42	470	A		9.0	329 - 611	21.83	A

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

*Laboratory Results For MAPEP-20-MaS43*

(IAEA20) IAEA Radiometrics Laboratory

4a, Quai Antoine 1er

Monaco, Monaco 98000

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	53				37 - 69		
Arsenic	NR	16.7				11.7 - 21.7		
Barium	NR	275				193 - 358		
Beryllium	NR	40.5				28.4 - 52.7		
Cadmium	NR	9.71				6.80 - 12.62		
Chromium	NR	109.2				76.4 - 142.0		
Cobalt	NR	109.2				76.4 - 142.0		
Copper	NR	163				114 - 212		
Lead	NR	51.0				35.7 - 66.3		
Mercury	NR	0.630				0.441 - 0.819		
Nickel	NR	238				167 - 309		
Selenium	NR	8.03				5.62 - 10.44		
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	NR	43.1				30.2 - 56.0		
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	NR	153				107 - 199		
Zinc	NR	280				196 - 364		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR			(11)		False Positive Test		
Cesium-134	692	710	A		-2.5	497 - 923	25	A
Cesium-137	NR			(11)		False Positive Test		
Cobalt-57	1083	1100	A		-1.5	770 - 1430	42	A
Cobalt-60	988	1000	A		-1.2	700 - 1300	38	A
Iron-55	NR	577				404 - 750		
Manganese-54	608	610	A		-0.3	427 - 793	25	A
Nickel-63	NR	980				686 - 1274		
Plutonium-238	NR	57.7				40.4 - 75.0		
Plutonium-239/240	NR	79				55 - 103		
Potassium-40	597	622	A		-4.0	435 - 809	27	A
Strontium-90	NR	487				341 - 633		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR					False Positive Test		
Uranium-234	NR	48.1				33.7 - 62.5		
Uranium-238	NR	128				90 - 166		
Zinc-65	475	470	A		1.1	329 - 611	19	A

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

Laboratory Results For MAPEP-20-MaS43  
 (IAEA99) International Atomic Energy Agency  
 Agency's Laboratories Seibersdorf  
 Seibersdorf, Austria A-2444

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	53				37 - 69		
Arsenic	NR	16.7				11.7 - 21.7		
Barium	NR	275				193 - 358		
Beryllium	NR	40.5				28.4 - 52.7		
Cadmium	NR	9.71				6.80 - 12.62		
Chromium	NR	109.2				76.4 - 142.0		
Cobalt	NR	109.2				76.4 - 142.0		
Copper	NR	163				114 - 212		
Lead	NR	51.0				35.7 - 66.3		
Mercury	NR	0.630				0.441 - 0.819		
Nickel	NR	238				167 - 309		
Selenium	NR	8.03				5.62 - 10.44		
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	NR	43.1				30.2 - 56.0		
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	NR	153				107 - 199		
Zinc	NR	280				196 - 364		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.5		A			False Positive Test	1.1	
Cesium-134	703	710	A		-1.0	497 - 923	26	A
Cesium-137	2.2		A			False Positive Test	1.5	
Cobalt-57	1091	1100	A		-0.8	770 - 1430	34	A
Cobalt-60	989	1000	A		-1.1	700 - 1300	37	A
Iron-55	NR	577				404 - 750		
Manganese-54	607	610	A		-0.5	427 - 793	21	A
Nickel-63	NR	980				686 - 1274		
Plutonium-238	NR	57.7				40.4 - 75.0		
Plutonium-239/240	NR	79				55 - 103		
Potassium-40	602	622	A		-3.2	435 - 809	25	A
Strontium-90	NR	487				341 - 633		



Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR					False Positive Test		
Uranium-234	45	48.1	A		-6.4	33.7 - 62.5	2	A
Uranium-238	116	128	A		-9.4	90 - 166	3	A
Zinc-65	478	470	A		1.7	329 - 611	17	A

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

*Laboratory Results For MAPEP-20-MaS43*

(IEMA01) Illinois Emergency Management Agency Radiochemistry Laboratory

1301 Knotts St.

Springfield, IL 62703

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	53				37 - 69		
Arsenic	NR	16.7				11.7 - 21.7		
Barium	NR	275				193 - 358		
Beryllium	NR	40.5				28.4 - 52.7		
Cadmium	NR	9.71				6.80 - 12.62		
Chromium	NR	109.2				76.4 - 142.0		
Cobalt	NR	109.2				76.4 - 142.0		
Copper	NR	163				114 - 212		
Lead	NR	51.0				35.7 - 66.3		
Mercury	NR	0.630				0.441 - 0.819		
Nickel	NR	238				167 - 309		
Selenium	NR	8.03				5.62 - 10.44		
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	NR	43.1				30.2 - 56.0		
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	NR	153				107 - 199		
Zinc	NR	280				196 - 364		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.80		A			False Positive Test	0.27	
Cesium-134	697.0	710	A		-1.8	497 - 923	5.1	N
Cesium-137	0.6		A			False Positive Test	1.3	
Cobalt-57	1050	1100	A		-4.5	770 - 1430	11	N
Cobalt-60	1005.0	1000	A		0.5	700 - 1300	9.7	N
Iron-55	NR	577				404 - 750		
Manganese-54	611.5	610	A		0.2	427 - 793	8.0	N
Nickel-63	NR	980				686 - 1274		
Plutonium-238	61.9	57.7	A		7.3	40.4 - 75.0	2.9	A
Plutonium-239/240	83.0	79	A		5.1	55 - 103	3.5	A
Potassium-40	617	622	A		-0.8	435 - 809	15	A
Strontium-90	353	487	W		-27.5	341 - 633	23	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR					False Positive Test		
Uranium-234	42.5	48.1	A		-11.6	33.7 - 62.5	2.1	A
Uranium-238	110.7	128	A		-13.5	90 - 166	4.1	A
Zinc-65	478.5	470	A		1.8	329 - 611	7.7	N

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

Laboratory Results For MAPEP-20-MaS43  
 (ISUE01) ISU Environmental Monitoring Laboratory  
 785 5th 8th Ave Rm B107  
 Pocatello, Idaho 83209

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	53				37 - 69		
Arsenic	NR	16.7				11.7 - 21.7		
Barium	NR	275				193 - 358		
Beryllium	NR	40.5				28.4 - 52.7		
Cadmium	NR	9.71				6.80 - 12.62		
Chromium	NR	109.2				76.4 - 142.0		
Cobalt	NR	109.2				76.4 - 142.0		
Copper	NR	163				114 - 212		
Lead	NR	51.0				35.7 - 66.3		
Mercury	NR	0.630				0.441 - 0.819		
Nickel	NR	238				167 - 309		
Selenium	NR	8.03				5.62 - 10.44		
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	NR	43.1				30.2 - 56.0		
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	NR	153				107 - 199		
Zinc	NR	280				196 - 364		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	645.4	710	A		-9.1	497 - 923	19.1	A
Cesium-137	4.69		A			False Positive Test	2.04	
Cobalt-57	1156.4	1100	A		5.1	770 - 1430	82.9	A
Cobalt-60	974.84	1000	A		-2.5	700 - 1300	29.36	A
Iron-55	NR	577				404 - 750		
Manganese-54	646.6	610	A		6.0	427 - 793	34.20	A
Nickel-63	NR	980				686 - 1274		
Plutonium-238	NR	57.7				40.4 - 75.0		
Plutonium-239/240	NR	79				55 - 103		
Potassium-40	741	622	A		19.1	435 - 809	46.2	A
Strontium-90	NR	487				341 - 633		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR					False Positive Test		
Uranium-234	NR	48.1				33.7 - 62.5		
Uranium-238	NR	128				90 - 166		
Zinc-65	487.3	470	A		3.7	329 - 611	24.97	A

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

**Laboratory Results For MAPEP-20-MaS43**

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

785 S. 8th Ave, Rm 120

Pocatello, ID 83209-8106

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	53				37 - 69		
Arsenic	NR	16.7				11.7 - 21.7		
Barium	NR	275				193 - 358		
Beryllium	NR	40.5				28.4 - 52.7		
Cadmium	NR	9.71				6.80 - 12.62		
Chromium	NR	109.2				76.4 - 142.0		
Cobalt	NR	109.2				76.4 - 142.0		
Copper	NR	163				114 - 212		
Lead	NR	51.0				35.7 - 66.3		
Mercury	NR	0.630				0.441 - 0.819		
Nickel	NR	238				167 - 309		
Selenium	NR	8.03				5.62 - 10.44		
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	NR	43.1				30.2 - 56.0		
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	NR	153				107 - 199		
Zinc	NR	280				196 - 364		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	631	710	A		-11.1	497 - 923	25	A
Cesium-137	1		A			False Positive Test	1	
Cobalt-57	1198	1100	A		8.9	770 - 1430	56	A
Cobalt-60	1075.9	1000	A		7.6	700 - 1300	44.6	A
Iron-55	NR	577				404 - 750		
Manganese-54	672	610	A		10.2	427 - 793	30	A
Nickel-63	NR	980				686 - 1274		
Plutonium-238	NR	57.7				40.4 - 75.0		
Plutonium-239/240	NR	79				55 - 103		
Potassium-40	745	622	A		19.8	435 - 809	40	A
Strontium-90	NR	487				341 - 633		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR					False Positive Test		
Uranium-234	NR	48.1				33.7 - 62.5		
Uranium-238	NR	128				90 - 166		
Zinc-65	541	470	A		15.1	329 - 611	26	A

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

### Laboratory Results For MAPEP-20-MaS43

(JAEC99) Research Laboratories and Information Directorate

Jordan Atomic Energy Commission

Amman, Jordan 70 (11934)

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	43.27	53	A		-18.4	37 - 69	4.22	A
Arsenic	9.13	16.7	N		-45.3	11.7 - 21.7	0.91	A
Barium	326	275	A		18.5	193 - 358	32.6	A
Beryllium	26.14	40.5	N		-35.5	28.4 - 52.7	4.96	W
Cadmium	7.38	9.71	W		-24.0	6.80 - 12.62	0.74	A
Chromium	NR	109.2				76.4 - 142.0		
Cobalt	101.00	109.2	A		-7.5	76.4 - 142.0	10.10	A
Copper	144.00	163	A		-11.7	114 - 212	14.4	A
Lead	56.93	51.0	A		11.6	35.7 - 66.3	5.69	A
Mercury	NR	0.630				0.441 - 0.819		
Nickel	205.95	238	A		-13.5	167 - 309	20.60	A
Selenium	13.84	8.03	N		72.4	5.62 - 10.44	1.38	A
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	37.65	43.1	A		-12.6	30.2 - 56.0	3.77	A
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	7.76	10.3	W		-24.7	7.2 - 13.4	0.54	A
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	195.8	153	W		28.0	107 - 199	23.85	A
Zinc	195.85	280	N		-30.1	196 - 364	19.59	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	753.76	710	A		6.2	497 - 923	3.41	N
Cesium-137	NR		N	(11)		False Positive Test		
Cobalt-57	1075.16	1100	A		-2.3	770 - 1430	8.76	N
Cobalt-60	966.73	1000	A		-3.3	700 - 1300	5.13	N
Iron-55	NR	577				404 - 750		
Manganese-54	643.36	610	A		5.5	427 - 793	4.43	N
Nickel-63	NR	980				686 - 1274		
Plutonium-238	NR	57.7				40.4 - 75.0		
Plutonium-239/240	NR	79				55 - 103		
Potassium-40	678.13	622	A		9.0	435 - 809	13.49	N
Strontium-90	432.239	487	A		-11.2	341 - 633	67.515	W



Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR					False Positive Test		
Uranium-234	147.308	48.1	N		206.3	33.7 - 62.5	13.53	A
Uranium-238	115.971	128	A		-9.4	90 - 166	11.51	A
Zinc-65	498.67	470	A		6.1	329 - 611	4.4	N

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

*Laboratory Results For MAPEP-20-MaS43*

(JLNN01) Jefferson Laboratory

111 Hadron Drive

Newport News, VA 23606

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	53				37 - 69		
Arsenic	NR	16.7				11.7 - 21.7		
Barium	NR	275				193 - 358		
Beryllium	NR	40.5				28.4 - 52.7		
Cadmium	NR	9.71				6.80 - 12.62		
Chromium	NR	109.2				76.4 - 142.0		
Cobalt	NR	109.2				76.4 - 142.0		
Copper	NR	163				114 - 212		
Lead	NR	51.0				35.7 - 66.3		
Mercury	NR	0.630				0.441 - 0.819		
Nickel	NR	238				167 - 309		
Selenium	NR	8.03				5.62 - 10.44		
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	NR	43.1				30.2 - 56.0		
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	NR	153				107 - 199		
Zinc	NR	280				196 - 364		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	-0.735		A			False Positive Test	0.535	
Cesium-134	663.8	710	A		-6.5	497 - 923	7.187	N
Cesium-137	1.145		A			False Positive Test	0.462	
Cobalt-57	1159	1100	A		5.4	770 - 1430	22.479	N
Cobalt-60	1058.7	1000	A		5.9	700 - 1300	8.813	N
Iron-55	NR	577				404 - 750		
Manganese-54	642.00	610	A		5.2	427 - 793	14.526	A
Nickel-63	NR	980				686 - 1274		
Plutonium-238	NR	57.7				40.4 - 75.0		
Plutonium-239/240	NR	79				55 - 103		
Potassium-40	656.05	622	A		5.5	435 - 809	18.231	A
Strontium-90	NR	487				341 - 633		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR					False Positive Test		
Uranium-234	NR	48.1				33.7 - 62.5		
Uranium-238	NR	128				90 - 166		
Zinc-65	510.70	470	A		8.7	329 - 611	12.393	A

Radiological Reference Date: August 1, 2020

**Results 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

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

Laboratory Results For MAPEP-20-MaS43  
 (LANL01) Los Alamos National Laboratory  
 Mail Stop J514  
 Los Alamos, NM 87545

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	53				37 - 69		
Arsenic	NR	16.7				11.7 - 21.7		
Barium	NR	275				193 - 358		
Beryllium	NR	40.5				28.4 - 52.7		
Cadmium	NR	9.71				6.80 - 12.62		
Chromium	NR	109.2				76.4 - 142.0		
Cobalt	NR	109.2				76.4 - 142.0		
Copper	NR	163				114 - 212		
Lead	NR	51.0				35.7 - 66.3		
Mercury	NR	0.630				0.441 - 0.819		
Nickel	NR	238				167 - 309		
Selenium	NR	8.03				5.62 - 10.44		
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	NR	43.1				30.2 - 56.0		
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	NR	153				107 - 199		
Zinc	NR	280				196 - 364		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	496	710	N		-30.1	497 - 923	26	A
Cesium-137	NR		N	(11)		False Positive Test		
Cobalt-57	757	1100	N		-31.2	770 - 1430	40	A
Cobalt-60	900	1000	A		-10.0	700 - 1300	43	A
Iron-55	NR	577				404 - 750		
Manganese-54	525	610	A		-13.9	427 - 793	27	A
Nickel-63	NR	980				686 - 1274		
Plutonium-238	NR	57.7				40.4 - 75.0		
Plutonium-239/240	NR	79				55 - 103		
Potassium-40	NR	622	N	(25)		435 - 809		
Strontium-90	NR	487				341 - 633		

Radiological						Units: (Bq/kg)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR					False Positive Test		
Uranium-234	NR	48.1				33.7 - 62.5		
Uranium-238	NR	128				90 - 166		
Zinc-65	NR	470	N	(25)		329 - 611		

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

*Laboratory Results For MAPEP-20-MaS43*

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

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	53				37 - 69		
Arsenic	NR	16.7				11.7 - 21.7		
Barium	NR	275				193 - 358		
Beryllium	NR	40.5				28.4 - 52.7		
Cadmium	NR	9.71				6.80 - 12.62		
Chromium	NR	109.2				76.4 - 142.0		
Cobalt	NR	109.2				76.4 - 142.0		
Copper	NR	163				114 - 212		
Lead	NR	51.0				35.7 - 66.3		
Mercury	NR	0.630				0.441 - 0.819		
Nickel	NR	238				167 - 309		
Selenium	NR	8.03				5.62 - 10.44		
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	NR	43.1				30.2 - 56.0		
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	NR	153				107 - 199		
Zinc	NR	280				196 - 364		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	642.2	710	A		-9.5	497 - 923	34.49	A
Cesium-137	2.025		A			False Positive Test	2.246	
Cobalt-57	983.1	1100	A		-10.6	770 - 1430	52.51	A
Cobalt-60	917.7	1000	A		-8.2	700 - 1300	49.52	A
Iron-55	NR	577				404 - 750		
Manganese-54	592.3	610	A		-2.9	427 - 793	31.84	A
Nickel-63	NR	980				686 - 1274		
Plutonium-238	NR	57.7				40.4 - 75.0		
Plutonium-239/240	NR	79				55 - 103		
Potassium-40	595.8	622	A		-4.2	435 - 809	45.95	A
Strontium-90	NR	487				341 - 633		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR					False Positive Test		
Uranium-234	NR	48.1				33.7 - 62.5		
Uranium-238	NR	128				90 - 166		
Zinc-65	466.7	470	A		-0.7	329 - 611	27.44	A

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

*Laboratory Results For MAPEP-20-MaS43*

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

INL/Battelle Energy Alliance, LLC

Idaho Falls, ID 83415-7111

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	53				37 - 69		
Arsenic	NR	16.7				11.7 - 21.7		
Barium	NR	275				193 - 358		
Beryllium	NR	40.5				28.4 - 52.7		
Cadmium	NR	9.71				6.80 - 12.62		
Chromium	NR	109.2				76.4 - 142.0		
Cobalt	NR	109.2				76.4 - 142.0		
Copper	NR	163				114 - 212		
Lead	NR	51.0				35.7 - 66.3		
Mercury	NR	0.630				0.441 - 0.819		
Nickel	NR	238				167 - 309		
Selenium	NR	8.03				5.62 - 10.44		
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	NR	43.1				30.2 - 56.0		
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	NR	153				107 - 199		
Zinc	NR	280				196 - 364		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	728.33	710	A		2.6	497 - 923	36.67	A
Cesium-137	1.06		A			False Positive Test	1.20	
Cobalt-57	1296.67	1100	A		17.9	770 - 1430	70.00	A
Cobalt-60	1060.00	1000	A		6.0	700 - 1300	56.67	A
Iron-55	NR	577				404 - 750		
Manganese-54	663.00	610	A		8.7	427 - 793	34.00	A
Nickel-63	NR	980				686 - 1274		
Plutonium-238	NR	57.7				40.4 - 75.0		
Plutonium-239/240	NR	79				55 - 103		
Potassium-40	673.00	622	A		8.2	435 - 809	39.33	A
Strontium-90	NR	487				341 - 633		



Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR					False Positive Test		
Uranium-234	NR	48.1				33.7 - 62.5		
Uranium-238	NR	128				90 - 166		
Zinc-65	518.67	470	A		10.4	329 - 611	27.00	A

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

*Laboratory Results For MAPEP-20-MaS43*

(MALA99) Alypz Sdn. Bhd.

No. 14, JLN USJ 1/1

Subang Jaya, Selangor 47600

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	53				37 - 69		
Arsenic	NR	16.7				11.7 - 21.7		
Barium	NR	275				193 - 358		
Beryllium	NR	40.5				28.4 - 52.7		
Cadmium	NR	9.71				6.80 - 12.62		
Chromium	NR	109.2				76.4 - 142.0		
Cobalt	NR	109.2				76.4 - 142.0		
Copper	NR	163				114 - 212		
Lead	NR	51.0				35.7 - 66.3		
Mercury	NR	0.630				0.441 - 0.819		
Nickel	NR	238				167 - 309		
Selenium	NR	8.03				5.62 - 10.44		
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	NR	43.1				30.2 - 56.0		
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	NR	153				107 - 199		
Zinc	NR	280				196 - 364		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	726	710	A		2.3	497 - 923	13	N
Cesium-137	3.6			A		False Positive Test	7.4	
Cobalt-57	1204	1100	A		9.5	770 - 1430	64	A
Cobalt-60	1037	1000	A		3.7	700 - 1300	22	A
Iron-55	NR	577				404 - 750		
Manganese-54	690	610	A		13.1	427 - 793	20	A
Nickel-63	NR	980				686 - 1274		
Plutonium-238	NR	57.7				40.4 - 75.0		
Plutonium-239/240	NR	79				55 - 103		
Potassium-40	682	622	A		9.6	435 - 809	49	A
Strontium-90	NR	487				341 - 633		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR					False Positive Test		
Uranium-234	NR	48.1				33.7 - 62.5		
Uranium-238	NR	128				90 - 166		
Zinc-65	527	470	A		12.1	329 - 611	17	A

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

Laboratory Results For MAPEP-20-MaS43  
 (MART01) Fluor B&W Ports Analytical Laboratory  
 Lab COC, Bldg. X-710, Rm 222  
 Piketon, OH 45661-

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	45.7	53	A		-13.8	37 - 69	21.1	N
Arsenic	11.9	16.7	W		-28.7	11.7 - 21.7	5.12	N
Barium	256	275	A		-6.9	193 - 358	16.8	A
Beryllium	40.8	40.5	A		0.7	28.4 - 52.7	1.90	A
Cadmium	23.9	9.71	N		146.1	6.80 - 12.62	1.34	A
Chromium	105	109.2	A		-3.8	76.4 - 142.0	9.82	A
Cobalt	107	109.2	A		-2.0	76.4 - 142.0	5.06	A
Copper	177	163	A		8.6	114 - 212	10.6	A
Lead	51.0	51.0	A		0.0	35.7 - 66.3	3.15	A
Mercury	0.519	0.630	A		-17.6	0.441 - 0.819	0.013	A
Nickel	226	238	A		-5.0	167 - 309	18.9	A
Selenium	1.73	8.03	N		-78.5	5.62 - 10.44	0.90	N
Silver	78.3	84.9	A		-7.8	59.4 - 110.4	6.92	A
Technetium-99	NR					False Positive Test		
Thallium	27.6	43.1	N		-36.0	30.2 - 56.0	1.74	A
Uranium-235	0.0354	0.0343	A		3.2	0.0240 - 0.0446	0.0132	N
Uranium-238	9.77	10.3	A		-5.1	7.2 - 13.4	1.19	A
Uranium-Total	9.80	10.3	A		-4.9	7.2 - 13.4	0.634	A
Vanadium	149	153	A		-2.6	107 - 199	11.6	A
Zinc	427	280	N		52.5	196 - 364	35.9	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.4205		A			False Positive Test	0.4159	
Cesium-134	605.2	710	A		-14.8	497 - 923	8.768	N
Cesium-137	0.6116		A			False Positive Test	1.506	
Cobalt-57	1026	1100	A		-6.7	770 - 1430	12.95	N
Cobalt-60	956.7	1000	A		-4.3	700 - 1300	13.08	N
Iron-55	NR	577				404 - 750		
Manganese-54	619.3	610	A		1.5	427 - 793	14.32	A
Nickel-63	NR	980				686 - 1274		
Plutonium-238	62.13	57.7	A		7.7	40.4 - 75.0	5.487	A
Plutonium-239/240	82.35	79	A		4.2	55 - 103	7.018	A
Potassium-40	598.5	622	A		-3.8	435 - 809	30.89	A
Strontium-90	NR	487				341 - 633		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	6.37		A			False Positive Test	3.23	
Uranium-234	54.1	48.1	A		12.5	33.7 - 62.5	4.709	A
Uranium-238	117	128	A		-8.6	90 - 166	9.570	A
Zinc-65	500.9	470	A		6.6	329 - 611	15.56	A

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

Laboratory Results For MAPEP-20-MaS43  
 (MART03) Radioactive Material Analysis Laboratory  
 ORNL  
 Oak Ridge, TN 37830

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	53				37 - 69		
Arsenic	NR	16.7				11.7 - 21.7		
Barium	NR	275				193 - 358		
Beryllium	NR	40.5				28.4 - 52.7		
Cadmium	NR	9.71				6.80 - 12.62		
Chromium	NR	109.2				76.4 - 142.0		
Cobalt	NR	109.2				76.4 - 142.0		
Copper	NR	163				114 - 212		
Lead	NR	51.0				35.7 - 66.3		
Mercury	NR	0.630				0.441 - 0.819		
Nickel	NR	238				167 - 309		
Selenium	NR	8.03				5.62 - 10.44		
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	NR	43.1				30.2 - 56.0		
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	NR	153				107 - 199		
Zinc	NR	280				196 - 364		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	608.1	710	A		-14.4	497 - 923	5.3	N
Cesium-137	2.7		A			False Positive Test	3.1	
Cobalt-57	1077	1100	A		-2.1	770 - 1430	11	N
Cobalt-60	994.9	1000	A		-0.5	700 - 1300	9.7	N
Iron-55	NR	577				404 - 750		
Manganese-54	629.5	610	A		3.2	427 - 793	8.3	N
Nickel-63	NR	980				686 - 1274		
Plutonium-238	NR	57.7				40.4 - 75.0		
Plutonium-239/240	NR	79				55 - 103		
Potassium-40	667	622	A		7.2	435 - 809	18	A
Strontium-90	NR	487				341 - 633		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR					False Positive Test		
Uranium-234	NR	48.1				33.7 - 62.5		
Uranium-238	NR	128				90 - 166		
Zinc-65	516	470	A		9.8	329 - 611	10	N

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

Laboratory Results For MAPEP-20-MaS43  
 (MDPH01) MDPH-Radiation Control Program  
 MERL-Room 002  
 Jamaica Plain, MA 02130-3597

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	53				37 - 69		
Arsenic	NR	16.7				11.7 - 21.7		
Barium	NR	275				193 - 358		
Beryllium	NR	40.5				28.4 - 52.7		
Cadmium	NR	9.71				6.80 - 12.62		
Chromium	NR	109.2				76.4 - 142.0		
Cobalt	NR	109.2				76.4 - 142.0		
Copper	NR	163				114 - 212		
Lead	NR	51.0				35.7 - 66.3		
Mercury	NR	0.630				0.441 - 0.819		
Nickel	NR	238				167 - 309		
Selenium	NR	8.03				5.62 - 10.44		
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	NR	43.1				30.2 - 56.0		
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	NR	153				107 - 199		
Zinc	NR	280				196 - 364		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	721.50	710	A		1.6	497 - 923	17.80	A
Cesium-137	NR		N	(11)		False Positive Test		
Cobalt-57	1221.00	1100	A		11.0	770 - 1430	46.25	A
Cobalt-60	1061.90	1000	A		6.2	700 - 1300	29.97	A
Iron-55	NR	577				404 - 750		
Manganese-54	654.90	610	A		7.4	427 - 793	16.02	A
Nickel-63	NR	980				686 - 1274		
Plutonium-238	NR	57.7				40.4 - 75.0		
Plutonium-239/240	NR	79				55 - 103		
Potassium-40	669.70	622	A		7.7	435 - 809	25.60	A
Strontium-90	NR	487				341 - 633		



Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR					False Positive Test		
Uranium-234	NR	48.1				33.7 - 62.5		
Uranium-238	NR	128				90 - 166		
Zinc-65	521.70	470	A		11.0	329 - 611	13.17	A

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

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

*Laboratory Results For MAPEP-20-MaS43*

(NESI01) BWXT-Radioisotope &amp; Analytical Chemistry Laboratory

Lynchburg Technology Center

Lynchburg, VA 24504-5447

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	50.06	53	A		-5.5	37 - 69	1.793	A
Arsenic	16.6	16.7	A		-0.6	11.7 - 21.7	0.29	N
Barium	287	275	A		4.4	193 - 358	4.76	N
Beryllium	38.9	40.5	A		-4.0	28.4 - 52.7	0.983	A
Cadmium	9.5	9.71	A		-2.2	6.80 - 12.62	0.211	A
Chromium	85.2	109.2	W		-22.0	76.4 - 142.0	1.14	N
Cobalt	90.9	109.2	A		-16.8	76.4 - 142.0	1.4	N
Copper	142.3	163	A		-12.7	114 - 212	2.74	N
Lead	53.4	51.0	A		4.7	35.7 - 66.3	1.169	A
Mercury	NR	0.630				0.441 - 0.819		
Nickel	202	238	A		-15.1	167 - 309	4.47	A
Selenium	7.8	8.03	A		-2.9	5.62 - 10.44	0.481	A
Silver	82.6	84.9	A		-2.7	59.4 - 110.4	1.26	N
Technetium-99	NR					False Positive Test		
Thallium	40.0	43.1	A		-7.2	30.2 - 56.0	0.993	A
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	117	153	W		-23.5	107 - 199	2.28	N
Zinc	250	280	A		-10.7	196 - 364	5.27	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	1.44		A			False Positive Test	2.50	
Cesium-134	788	710	A		11.0	497 - 923	32.3	A
Cesium-137	0.802		A			False Positive Test	2.64	
Cobalt-57	1444	1100	N		31.3	770 - 1430	56.2	A
Cobalt-60	1240	1000	W		24.0	700 - 1300	52.7	A
Iron-55	NR	577	N	(28)		404 - 750		
Manganese-54	789	610	W		29.3	427 - 793	33.2	A
Nickel-63	NR	980	N	(28)		686 - 1274		
Plutonium-238	54.66	57.7	A		-5.3	40.4 - 75.0	7.40	A
Plutonium-239/240	75.4	79	A		-4.6	55 - 103	8.77	A
Potassium-40	796	622	W		28.0	435 - 809	37.2	A
Strontium-90	NR	487	N	(28)		341 - 633		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	-44.0		A			False Positive Test	29.4	
Uranium-234	44.6	48.1	A		-7.3	33.7 - 62.5	4.22	A
Uranium-238	118.7	128	A		-7.3	90 - 166	7.6	A
Zinc-65	635	470	N		35.1	329 - 611	27.2	A

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

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

Laboratory Results For MAPEP-20-MaS43  
 (NJDH01) New Jersey Dept. of Health, PHEL, ECLS  
 3 Schwarzkopf Drive  
 West Trenton, NJ 08628

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	53				37 - 69		
Arsenic	NR	16.7				11.7 - 21.7		
Barium	NR	275				193 - 358		
Beryllium	NR	40.5				28.4 - 52.7		
Cadmium	NR	9.71				6.80 - 12.62		
Chromium	NR	109.2				76.4 - 142.0		
Cobalt	NR	109.2				76.4 - 142.0		
Copper	NR	163				114 - 212		
Lead	NR	51.0				35.7 - 66.3		
Mercury	NR	0.630				0.441 - 0.819		
Nickel	NR	238				167 - 309		
Selenium	NR	8.03				5.62 - 10.44		
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	NR	43.1				30.2 - 56.0		
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	NR	153				107 - 199		
Zinc	NR	280				196 - 364		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR		N	(11)		False Positive Test		
Cesium-134	547	710	W		-23.0	497 - 923	25	A
Cesium-137	1.54		A			False Positive Test	0.88	
Cobalt-57	934	1100	A		-15.1	770 - 1430	32	A
Cobalt-60	867	1000	A		-13.3	700 - 1300	35	A
Iron-55	NR	577				404 - 750		
Manganese-54	510	610	A		-16.4	427 - 793	17	A
Nickel-63	NR	980				686 - 1274		
Plutonium-238	NR	57.7				40.4 - 75.0		
Plutonium-239/240	NR	79				55 - 103		
Potassium-40	563	622	A		-9.5	435 - 809	24	A
Strontium-90	NR	487				341 - 633		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR					False Positive Test		
Uranium-234	NR	48.1				33.7 - 62.5		
Uranium-238	NR	128				90 - 166		
Zinc-65	399	470	A		-15.1	329 - 611	15	A

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

Laboratory Results For MAPEP-20-MaS43  
 (NOCS99) National Oceanography Centre, Southampton  
 GAU-Radioanalytical  
 Southampton, Hampshire SO14 3ZH

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	53				37 - 69		
Arsenic	NR	16.7				11.7 - 21.7		
Barium	NR	275				193 - 358		
Beryllium	NR	40.5				28.4 - 52.7		
Cadmium	NR	9.71				6.80 - 12.62		
Chromium	NR	109.2				76.4 - 142.0		
Cobalt	NR	109.2				76.4 - 142.0		
Copper	NR	163				114 - 212		
Lead	NR	51.0				35.7 - 66.3		
Mercury	NR	0.630				0.441 - 0.819		
Nickel	NR	238				167 - 309		
Selenium	NR	8.03				5.62 - 10.44		
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	NR	43.1				30.2 - 56.0		
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	NR	153				107 - 199		
Zinc	NR	280				196 - 364		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	1		A			False Positive Test	1	
Cesium-134	710	710	A		0.0	497 - 923	20	A
Cesium-137	5		A			False Positive Test	5	
Cobalt-57	1040	1100	A		-5.5	770 - 1430	30	A
Cobalt-60	970	1000	A		-3.0	700 - 1300	30	A
Iron-55	350	577	N		-39.3	404 - 750	20	A
Manganese-54	590	610	A		-3.3	427 - 793	20	A
Nickel-63	810	980	A		-17.3	686 - 1274	40	A
Plutonium-238	53	57.7	A		-8.1	40.4 - 75.0	4	A
Plutonium-239/240	71	79	A		-10.1	55 - 103	5	A
Potassium-40	590	622	A		-5.1	435 - 809	20	A
Strontium-90	410	487	A		-15.8	341 - 633	30	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	5		A			False Positive Test	5	
Uranium-234	46	48.1	A		-4.4	33.7 - 62.5	4	A
Uranium-238	120	128	A		-6.3	90 - 166	8	A
Zinc-65	450	470	A		-4.3	329 - 611	10	A

Radiological Reference Date: August 1, 2020

**Results 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

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

Laboratory Results For MAPEP-20-MaS43  
 (ODHL01) Ohio Department of Health Laboratory  
 8995 E Main Street  
 Reynoldsburg, OH 43068

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	53				37 - 69		
Arsenic	NR	16.7				11.7 - 21.7		
Barium	NR	275				193 - 358		
Beryllium	NR	40.5				28.4 - 52.7		
Cadmium	NR	9.71				6.80 - 12.62		
Chromium	NR	109.2				76.4 - 142.0		
Cobalt	NR	109.2				76.4 - 142.0		
Copper	NR	163				114 - 212		
Lead	NR	51.0				35.7 - 66.3		
Mercury	NR	0.630				0.441 - 0.819		
Nickel	NR	238				167 - 309		
Selenium	NR	8.03				5.62 - 10.44		
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	NR	43.1				30.2 - 56.0		
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	NR	153				107 - 199		
Zinc	NR	280				196 - 364		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	719	710	A		1.3	497 - 923	20.6	A
Cesium-137	0.258		A			False Positive Test	1.02	
Cobalt-57	1200	1100	A		9.1	770 - 1430	81.9	A
Cobalt-60	982	1000	A		-1.8	700 - 1300	27.9	A
Iron-55	NR	577				404 - 750		
Manganese-54	608	610	A		-0.3	427 - 793	36.5	A
Nickel-63	NR	980				686 - 1274		
Plutonium-238	NR	57.7				40.4 - 75.0		
Plutonium-239/240	NR	79				55 - 103		
Potassium-40	578	622	A		-7.1	435 - 809	25.7	A
Strontium-90	NR	487				341 - 633		



Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR					False Positive Test		
Uranium-234	NR	48.1				33.7 - 62.5		
Uranium-238	NR	128				90 - 166		
Zinc-65	469	470	A		-0.2	329 - 611	20.6	A

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

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(28) = Not Reporting Previously Reported Analyte



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

Laboratory Results For MAPEP-20-MaS43

(ORIS01) ORISE/IEAV

PO Box 117

Oak Ridge, TN 37831-0117

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	47.9	53	A		-9.6	37 - 69	2.2	A
Arsenic	16.14	16.7	A		-3.4	11.7 - 21.7	0.73	A
Barium	243.2	275	A		-11.6	193 - 358	7.8	A
Beryllium	37.3	40.5	A		-7.9	28.4 - 52.7	1.7	A
Cadmium	9.09	9.71	A		-6.4	6.80 - 12.62	0.41	A
Chromium	99.0	109.2	A		-9.3	76.4 - 142.0	4.4	A
Cobalt	107.7	109.2	A		-1.4	76.4 - 142.0	4.7	A
Copper	172.6	163	A		5.9	114 - 212	8.2	A
Lead	50.6	51.0	A		-0.8	35.7 - 66.3	1.7	A
Mercury	NR	0.630				0.441 - 0.819		
Nickel	249	238	A		4.6	167 - 309	14	A
Selenium	6.70	8.03	A		-16.6	5.62 - 10.44	0.31	A
Silver	81.5	84.9	A		-4.0	59.4 - 110.4	3.4	A
Technetium-99	NR					False Positive Test		
Thallium	37.1	43.1	A		-13.9	30.2 - 56.0	1.5	A
Uranium-235	0.032	0.0343	A		-6.7	0.0240 - 0.0446	0.001	A
Uranium-238	9.66	10.3	A		-6.2	7.2 - 13.4	0.35	A
Uranium-Total	9.73	10.3	A		-5.5	7.2 - 13.4	0.33	A
Vanadium	152.2	153	A		-0.5	107 - 199	7.1	A
Zinc	313	280	A		11.8	196 - 364	15	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.59		A			False Positive Test	0.24	
Cesium-134	715	710	A		0.7	497 - 923	37	A
Cesium-137	0.1		A			False Positive Test	3.0	
Cobalt-57	1125	1100	A		2.3	770 - 1430	24	A
Cobalt-60	1005	1000	A		0.5	700 - 1300	31	A
Iron-55	520	577	A		-9.9	404 - 750	34	A
Manganese-54	634	610	A		3.9	427 - 793	32	A
Nickel-63	990	980	A		1.0	686 - 1274	28	A
Plutonium-238	68.5	57.7	A		18.7	40.4 - 75.0	4.1	A
Plutonium-239/240	90.8	79	A		14.9	55 - 103	5.2	A
Potassium-40	646	622	A		3.9	435 - 809	35	A
Strontium-90	467	487	A		-4.1	341 - 633	15	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	-4		A			False Positive Test	16	
Uranium-234	45.7	48.1	A		-5.0	33.7 - 62.5	3.1	A
Uranium-238	123.3	128	A		-3.7	90 - 166	6.8	A
Zinc-65	494	470	A		5.1	329 - 611	19	A

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

### Laboratory Results For MAPEP-20-MaS43

(OTLI01) Pace Analytical National Center for Testing & Innovation

12065 Lebanon Road

Mt. Juliet, TN 37122

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	34	53	N		-35.8	37 - 69	3	A
Arsenic	12.6	16.7	W		-24.6	11.7 - 21.7	1	A
Barium	262	275	A		-4.7	193 - 358	2.5	N
Beryllium	34.2	40.5	A		-15.6	28.4 - 52.7	2.5	A
Cadmium	9.45	9.71	A		-2.7	6.80 - 12.62	1	A
Chromium	82.1	109.2	W		-24.8	76.4 - 142.0	5	A
Cobalt	89.1	109.2	A		-18.4	76.4 - 142.0	1	N
Copper	148	163	A		-9.2	114 - 212	5	A
Lead	48.3	51.0	A		-5.3	35.7 - 66.3	2	A
Mercury	NR	0.630				0.441 - 0.819		
Nickel	192	238	A		-19.3	167 - 309	2.5	N
Selenium	7.97	8.03	A		-0.7	5.62 - 10.44	2.5	N
Silver	81.4	84.9	A		-4.1	59.4 - 110.4	0.5	N
Technetium-99	NR					False Positive Test		
Thallium	37.8	43.1	A		-12.3	30.2 - 56.0	2	A
Uranium-235	0.030	0.0343	A		-12.5	0.0240 - 0.0446	0.005	W
Uranium-238	10.3	10.3	A		0.0	7.2 - 13.4	0.5	A
Uranium-Total	8.12	10.3	W		-21.2	7.2 - 13.4	0.6	A
Vanadium	109	153	W		-28.8	107 - 199	2.5	A
Zinc	229	280	A		-18.2	196 - 364	25	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	2.11		A			False Positive Test	1.96	
Cesium-134	643	710	A		-9.4	497 - 923	34.4	A
Cesium-137	0.97		A			False Positive Test	2.5	
Cobalt-57	1100	1100	A		0.0	770 - 1430	60.3	A
Cobalt-60	1026	1000	A		2.6	700 - 1300	52.5	A
Iron-55	NR	577				404 - 750		
Manganese-54	678	610	A		11.1	427 - 793	36.4	A
Nickel-63	763	980	W		-22.1	686 - 1274	112	A
Plutonium-238	0.457	57.7	N		-99.2	40.4 - 75.0	1.48	N
Plutonium-239/240	0.596	79	N		-99.2	55 - 103	0.974	N
Potassium-40	706	622	A		13.5	435 - 809	45.3	A
Strontium-90	529	487	A		8.6	341 - 633	24.6	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	21.7		A			False Positive Test	17.9	
Uranium-234	51.9	48.1	A		7.9	33.7 - 62.5	6.12	A
Uranium-238	125	128	A		-2.3	90 - 166	8.7	A
Zinc-65	559	470	A		18.9	329 - 611	31.6	A

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

Laboratory Results For MAPEP-20-MaS43  
 (QUAN02) Eurofins TestAmerica Knoxville  
 5815 Middlebrook Pike  
 Knoxville, TN 37921-

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	46.2	53	A		-12.8	37 - 69	1.54	A
Arsenic	14.1	16.7	A		-15.6	11.7 - 21.7	0.47	A
Barium	216	275	W		-21.5	193 - 358	7.2	A
Beryllium	37.4	40.5	A		-7.7	28.4 - 52.7	1.24667	A
Cadmium	8.55	9.71	A		-11.9	6.80 - 12.62	0.285	A
Chromium	99.4	109.2	A		-9.0	76.4 - 142.0	3.31333	A
Cobalt	100	109.2	A		-8.4	76.4 - 142.0	3.33333	A
Copper	147	163	A		-9.8	114 - 212	4.9	A
Lead	45.3	51.0	A		-11.2	35.7 - 66.3	1.51	A
Mercury	0.614	0.630	A		-2.5	0.441 - 0.819	0.02047	A
Nickel	221	238	A		-7.1	167 - 309	7.36667	A
Selenium	5.91	8.03	W		-26.4	5.62 - 10.44	0.197	A
Silver	72.4	84.9	A		-14.7	59.4 - 110.4	2.41333	A
Technetium-99	NR					False Positive Test		
Thallium	38.4	43.1	A		-10.9	30.2 - 56.0	1.28	A
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	133.0	153	A		-13.1	107 - 199	4.43333	A
Zinc	259	280	A		-7.5	196 - 364	10.79167	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	NR	710				497 - 923		
Cesium-137	NR					False Positive Test		
Cobalt-57	NR	1100				770 - 1430		
Cobalt-60	NR	1000				700 - 1300		
Iron-55	NR	577				404 - 750		
Manganese-54	NR	610				427 - 793		
Nickel-63	NR	980				686 - 1274		
Plutonium-238	NR	57.7				40.4 - 75.0		
Plutonium-239/240	NR	79				55 - 103		
Potassium-40	NR	622				435 - 809		
Strontium-90	NR	487				341 - 633		

Radiological						Units: (Bq/kg)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR					False Positive Test		
Uranium-234	NR	48.1				33.7 - 62.5		
Uranium-238	NR	128				90 - 166		
Zinc-65	NR	470				329 - 611		

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

*Laboratory Results For MAPEP-20-MaS43*

(RAVR99) Radiactividad Ambiental y Vigilancia Radiologica

CIEMAT (Ed 70 P2 D11)

Madrid, Madrid 28040

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	53				37 - 69		
Arsenic	NR	16.7				11.7 - 21.7		
Barium	NR	275				193 - 358		
Beryllium	NR	40.5				28.4 - 52.7		
Cadmium	NR	9.71				6.80 - 12.62		
Chromium	NR	109.2				76.4 - 142.0		
Cobalt	NR	109.2				76.4 - 142.0		
Copper	NR	163				114 - 212		
Lead	NR	51.0				35.7 - 66.3		
Mercury	NR	0.630				0.441 - 0.819		
Nickel	NR	238				167 - 309		
Selenium	NR	8.03				5.62 - 10.44		
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	NR	43.1				30.2 - 56.0		
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	8.5	10.3	A		-17.5	7.2 - 13.4	0.6	A
Vanadium	NR	153				107 - 199		
Zinc	NR	280				196 - 364		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.33		A			False Positive Test	0.34	
Cesium-134	581	710	A		-18.2	497 - 923	40	A
Cesium-137	0.68		A			False Positive Test	2.2	
Cobalt-57	1009	1100	A		-8.3	770 - 1430	36	A
Cobalt-60	927	1000	A		-7.3	700 - 1300	16	N
Iron-55	NR	577				404 - 750		
Manganese-54	591	610	A		-3.1	427 - 793	16	A
Nickel-63	NR	980				686 - 1274		
Plutonium-238	47.6	57.7	A		-17.5	40.4 - 75.0	1.9	A
Plutonium-239/240	68.2	79	A		-13.7	55 - 103	2.5	A
Potassium-40	624	622	A		0.3	435 - 809	31	A
Strontium-90	394.19	487	A		-19.1	341 - 633	39.17	A



Radiological						Units: (Bq/kg)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR					False Positive Test		
Uranium-234	66.7	48.1	N		38.7	33.7 - 62.5	8.2	A
Uranium-238	141	128	A		10.2	90 - 166	13	A
Zinc-65	476	470	A		1.3	329 - 611	18	A

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

*Laboratory Results For MAPEP-20-MaS43*

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

2710 North 20th Avenue

Pasco, WA 99301

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	40.4	53	W		-23.8	37 - 69	2.24	A
Arsenic	14.3	16.7	A		-14.4	11.7 - 21.7	3.16	W
Barium	335	275	W		21.8	193 - 358	7.46	A
Beryllium	42.8	40.5	A		5.7	28.4 - 52.7	3.10	A
Cadmium	9.17	9.71	A		-5.6	6.80 - 12.62	1.88	W
Chromium	115	109.2	A		5.3	76.4 - 142.0	2.88	A
Cobalt	118	109.2	A		8.1	76.4 - 142.0	3.69	A
Copper	173	163	A		6.1	114 - 212	3.69	A
Lead	57.0	51.0	A		11.8	35.7 - 66.3	2.54	A
Mercury	0.647	0.630	A		2.7	0.441 - 0.819	0.243	N
Nickel	252	238	A		5.9	167 - 309	3.60	N
Selenium	7.03	8.03	A		-12.5	5.62 - 10.44	2.87	N
Silver	86.1	84.9	A		1.4	59.4 - 110.4	2.45	A
Technetium-99	NR					False Positive Test		
Thallium	48.2	43.1	A		11.8	30.2 - 56.0	1.63	A
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	10.3	10.3	A		0.0	7.2 - 13.4	1.43	A
Vanadium	158	153	A		3.3	107 - 199	3.18	A
Zinc	311	280	A		11.1	196 - 364	3.68	N

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	NR	710				497 - 923		
Cesium-137	NR					False Positive Test		
Cobalt-57	NR	1100				770 - 1430		
Cobalt-60	NR	1000				700 - 1300		
Iron-55	NR	577				404 - 750		
Manganese-54	NR	610				427 - 793		
Nickel-63	NR	980				686 - 1274		
Plutonium-238	NR	57.7				40.4 - 75.0		
Plutonium-239/240	NR	79				55 - 103		
Potassium-40	NR	622				435 - 809		
Strontium-90	NR	487				341 - 633		

Radiological						Units: (Bq/kg)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR					False Positive Test		
Uranium-234	NR	48.1				33.7 - 62.5		
Uranium-238	NR	128				90 - 166		
Zinc-65	NR	470				329 - 611		

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

Laboratory Results For MAPEP-20-MaS43  
 (SEML01) SRS Environmental Monitoring Laboratory  
 Bldg 735-B  
 Aiken, SC 29808

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	53				37 - 69		
Arsenic	NR	16.7				11.7 - 21.7		
Barium	NR	275				193 - 358		
Beryllium	NR	40.5				28.4 - 52.7		
Cadmium	NR	9.71				6.80 - 12.62		
Chromium	NR	109.2				76.4 - 142.0		
Cobalt	NR	109.2				76.4 - 142.0		
Copper	NR	163				114 - 212		
Lead	NR	51.0				35.7 - 66.3		
Mercury	NR	0.630				0.441 - 0.819		
Nickel	NR	238				167 - 309		
Selenium	NR	8.03				5.62 - 10.44		
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	NR	43.1				30.2 - 56.0		
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	NR	153				107 - 199		
Zinc	NR	280				196 - 364		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.65		A			False Positive Test	0.42	
Cesium-134	684	710	A		-3.7	497 - 923	19	A
Cesium-137	0.09		A			False Positive Test	0.45	
Cobalt-57	1025	1100	A		-6.8	770 - 1430	31	A
Cobalt-60	928	1000	A		-7.2	700 - 1300	27	A
Iron-55	NR	577				404 - 750		
Manganese-54	583	610	A		-4.4	427 - 793	19	A
Nickel-63	NR	980				686 - 1274		
Plutonium-238	60.5	57.7	A		4.9	40.4 - 75.0	4.7	A
Plutonium-239/240	81.3	79	A		2.9	55 - 103	6.1	A
Potassium-40	614	622	A		-1.3	435 - 809	21	A
Strontium-90	448.6	487	A		-7.9	341 - 633	25.4	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR					False Positive Test		
Uranium-234	44.3	48.1	A		-7.9	33.7 - 62.5	3.4	A
Uranium-238	113.8	128	A		-11.1	90 - 166	7.7	A
Zinc-65	461	470	A		-1.9	329 - 611	15	A

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

Laboratory Results For MAPEP-20-MaS43  
 (SLAC01) SLAC DOE National Accelerator Laboratory  
 2575 Sand Hill Road  
 Menlo Park, CA 94025

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	53				37 - 69		
Arsenic	NR	16.7				11.7 - 21.7		
Barium	NR	275				193 - 358		
Beryllium	NR	40.5				28.4 - 52.7		
Cadmium	NR	9.71				6.80 - 12.62		
Chromium	NR	109.2				76.4 - 142.0		
Cobalt	NR	109.2				76.4 - 142.0		
Copper	NR	163				114 - 212		
Lead	NR	51.0				35.7 - 66.3		
Mercury	NR	0.630				0.441 - 0.819		
Nickel	NR	238				167 - 309		
Selenium	NR	8.03				5.62 - 10.44		
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	NR	43.1				30.2 - 56.0		
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	NR	153				107 - 199		
Zinc	NR	280				196 - 364		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	588	710	A		-17.2	497 - 923	59	A
Cesium-137	2		A			False Positive Test	2	
Cobalt-57	1048	1100	A		-4.7	770 - 1430	105	A
Cobalt-60	911	1000	A		-8.9	700 - 1300	91	A
Iron-55	NR	577				404 - 750		
Manganese-54	577	610	A		-5.4	427 - 793	58	A
Nickel-63	NR	980				686 - 1274		
Plutonium-238	NR	57.7				40.4 - 75.0		
Plutonium-239/240	NR	79				55 - 103		
Potassium-40	580	622	A		-6.8	435 - 809	58	A
Strontium-90	NR	487				341 - 633		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR					False Positive Test		
Uranium-234	NR	48.1				33.7 - 62.5		
Uranium-238	NR	128				90 - 166		
Zinc-65	420	470	A		-10.6	329 - 611	42	A

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

*Laboratory Results For MAPEP-20-MaS43*

(SOUT01) Southwest Research Institute

6220 Culebra Rd.

San Antonio, TX 78228-0510

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	49.0	53	A		-7.5	37 - 69	6.81	A
Arsenic	16.5	16.7	A		-1.2	11.7 - 21.7	1.61	A
Barium	279	275	A		1.5	193 - 358	18.8	A
Beryllium	46.5	40.5	A		14.8	28.4 - 52.7	3.17	A
Cadmium	9.61	9.71	A		-1.0	6.80 - 12.62	0.689	A
Chromium	104	109.2	A		-4.8	76.4 - 142.0	7.02	A
Cobalt	104	109.2	A		-4.8	76.4 - 142.0	7.02	A
Copper	173	163	A		6.1	114 - 212	11.7	A
Lead	49.2	51.0	A		-3.5	35.7 - 66.3	3.34	A
Mercury	0.532	0.630	A		-15.6	0.441 - 0.819	0.0368	A
Nickel	224	238	A		-5.9	167 - 309	15.1	A
Selenium	9.35	8.03	A		16.4	5.62 - 10.44	0.672	A
Silver	83.1	84.9	A		-2.1	59.4 - 110.4	5.63	A
Technetium-99	NR					False Positive Test		
Thallium	40.5	43.1	A		-6.0	30.2 - 56.0	2.74	A
Uranium-235	0.0349	0.0343	A		1.7	0.0240 - 0.0446	0.00338	A
Uranium-238	10.9	10.3	A		5.8	7.2 - 13.4	0.736	A
Uranium-Total	11.0	10.3	A		6.8	7.2 - 13.4	0.743	A
Vanadium	149	153	A		-2.6	107 - 199	10.1	A
Zinc	278	280	A		-0.7	196 - 364	18.8	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.715		A			False Positive Test	0.289	
Cesium-134	507	710	W		-28.6	497 - 923	17.5	A
Cesium-137	1.94		A			False Positive Test	1.63	
Cobalt-57	889	1100	A		-19.2	770 - 1430	25.3	A
Cobalt-60	796	1000	W		-20.4	700 - 1300	27.7	A
Iron-55	541	577	A		-6.2	404 - 750	83.1	W
Manganese-54	493	610	A		-19.2	427 - 793	17.1	A
Nickel-63	607	980	N		-38.1	686 - 1274	39.6	A
Plutonium-238	61.9	57.7	A		7.3	40.4 - 75.0	4.44	A
Plutonium-239/240	75.9	79	A		-3.9	55 - 103	5.37	A
Potassium-40	530	622	A		-14.8	435 - 809	24.6	A
Strontium-90	474	487	A		-2.7	341 - 633	33.0	A



Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	-2.67		A			False Positive Test	5.22	
Uranium-234	40.7	48.1	A		-15.4	33.7 - 62.5	3.09	A
Uranium-238	116	128	A		-9.4	90 - 166	8.07	A
Zinc-65	407	470	A		-13.4	329 - 611	15.1	A

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

### Laboratory Results For MAPEP-20-MaS43

(SRPD01) Sandia National Laboratories, Radiation Protection Sample Diagnostics

PO Box 5800, MS1103

Albuquerque, NM 87185-1103

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	53				37 - 69		
Arsenic	NR	16.7				11.7 - 21.7		
Barium	NR	275				193 - 358		
Beryllium	NR	40.5				28.4 - 52.7		
Cadmium	NR	9.71				6.80 - 12.62		
Chromium	NR	109.2				76.4 - 142.0		
Cobalt	NR	109.2				76.4 - 142.0		
Copper	NR	163				114 - 212		
Lead	NR	51.0				35.7 - 66.3		
Mercury	NR	0.630				0.441 - 0.819		
Nickel	NR	238				167 - 309		
Selenium	NR	8.03				5.62 - 10.44		
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	NR	43.1				30.2 - 56.0		
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	NR	153				107 - 199		
Zinc	NR	280				196 - 364		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	736	710	A		3.7	497 - 923	23.8	A
Cesium-137	0.276		A			False Positive Test	1.50	
Cobalt-57	1070	1100	A		-2.7	770 - 1430	32.5	A
Cobalt-60	1010	1000	A		1.0	700 - 1300	28.8	A
Iron-55	NR	577				404 - 750		
Manganese-54	618	610	A		1.3	427 - 793	17.3	A
Nickel-63	NR	980				686 - 1274		
Plutonium-238	NR	57.7				40.4 - 75.0		
Plutonium-239/240	NR	79				55 - 103		
Potassium-40	613	622	A		-1.4	435 - 809	20.7	A
Strontium-90	NR	487				341 - 633		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR					False Positive Test		
Uranium-234	NR	48.1				33.7 - 62.5		
Uranium-238	NR	128				90 - 166		
Zinc-65	481	470	A		2.3	329 - 611	14.9	A

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

### Laboratory Results For MAPEP-20-MaS43

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

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	53				37 - 69		
Arsenic	NR	16.7				11.7 - 21.7		
Barium	NR	275				193 - 358		
Beryllium	NR	40.5				28.4 - 52.7		
Cadmium	NR	9.71				6.80 - 12.62		
Chromium	NR	109.2				76.4 - 142.0		
Cobalt	NR	109.2				76.4 - 142.0		
Copper	NR	163				114 - 212		
Lead	NR	51.0				35.7 - 66.3		
Mercury	NR	0.630				0.441 - 0.819		
Nickel	NR	238				167 - 309		
Selenium	NR	8.03				5.62 - 10.44		
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	NR	43.1				30.2 - 56.0		
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	NR	153				107 - 199		
Zinc	NR	280				196 - 364		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	94		N	(1)		False Positive Test	25	
Cesium-134	670	710	A		-5.6	497 - 923	13	N
Cesium-137	4.7		A			False Positive Test	4.6	
Cobalt-57	1029	1100	A		-6.5	770 - 1430	21	A
Cobalt-60	942	1000	A		-5.8	700 - 1300	19	A
Iron-55	NR	577				404 - 750		
Manganese-54	586	610	A		-3.9	427 - 793	16	A
Nickel-63	NR	980				686 - 1274		
Plutonium-238	49.3	57.7	A		-14.6	40.4 - 75.0	6.6	A
Plutonium-239/240	66.6	79	A		-15.7	55 - 103	8.1	A
Potassium-40	621	622	A		-0.2	435 - 809	35	A
Strontium-90	378	487	W		-22.4	341 - 633	13	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR					False Positive Test		
Uranium-234	41	48.1	A		-14.8	33.7 - 62.5	11	W
Uranium-238	114	128	A		-10.9	90 - 166	24	W
Zinc-65	470	470	A		0.0	329 - 611	18	A

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

## Laboratory Results For MAPEP-20-MaS43

(TELE01) Teledyne Brown Engineering - Environmental Services

2508 Quality Lane

Knoxville, TN 37931-6819

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	53				37 - 69		
Arsenic	NR	16.7				11.7 - 21.7		
Barium	NR	275				193 - 358		
Beryllium	NR	40.5				28.4 - 52.7		
Cadmium	NR	9.71				6.80 - 12.62		
Chromium	NR	109.2				76.4 - 142.0		
Cobalt	NR	109.2				76.4 - 142.0		
Copper	NR	163				114 - 212		
Lead	NR	51.0				35.7 - 66.3		
Mercury	NR	0.630				0.441 - 0.819		
Nickel	NR	238				167 - 309		
Selenium	NR	8.03				5.62 - 10.44		
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	NR	43.1				30.2 - 56.0		
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	NR	153				107 - 199		
Zinc	NR	280				196 - 364		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	NR	710				497 - 923		
Cesium-137	NR					False Positive Test		
Cobalt-57	NR	1100				770 - 1430		
Cobalt-60	NR	1000				700 - 1300		
Iron-55	NR	577				404 - 750		
Manganese-54	NR	610				427 - 793		
Nickel-63	438	980	N		-55.3	686 - 1274	21.1	A
Plutonium-238	NR	57.7				40.4 - 75.0		
Plutonium-239/240	NR	79				55 - 103		
Potassium-40	NR	622				435 - 809		
Strontium-90	NR	487	N	(28)		341 - 633		

Radiological						Units: (Bq/kg)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	1.11		A			False Positive Test	16.1	
Uranium-234	NR	48.1				33.7 - 62.5		
Uranium-238	NR	128				90 - 166		
Zinc-65	NR	470				329 - 611		

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

Laboratory Results For MAPEP-20-MaS43  
 (TELE02) ATI Environmental, Inc., Midwest Lab  
 700 Landwehr Road  
 Northbrook, IL 60062-

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	53				37 - 69		
Arsenic	NR	16.7				11.7 - 21.7		
Barium	NR	275				193 - 358		
Beryllium	NR	40.5				28.4 - 52.7		
Cadmium	NR	9.71				6.80 - 12.62		
Chromium	NR	109.2				76.4 - 142.0		
Cobalt	NR	109.2				76.4 - 142.0		
Copper	NR	163				114 - 212		
Lead	NR	51.0				35.7 - 66.3		
Mercury	NR	0.630				0.441 - 0.819		
Nickel	NR	238				167 - 309		
Selenium	NR	8.03				5.62 - 10.44		
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	NR	43.1				30.2 - 56.0		
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	NR	153				107 - 199		
Zinc	NR	280				196 - 364		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	599	710	A		-15.6	497 - 923	7	N
Cesium-137	3.33		A			False Positive Test	4.81	
Cobalt-57	1145	1100	A		4.1	770 - 1430	8	N
Cobalt-60	965	1000	A		-3.5	700 - 1300	9	N
Iron-55	NR	577				404 - 750		
Manganese-54	651	610	A		6.7	427 - 793	11	N
Nickel-63	NR	980				686 - 1274		
Plutonium-238	NR	57.7				40.4 - 75.0		
Plutonium-239/240	NR	79				55 - 103		
Potassium-40	684	622	A		10.0	435 - 809	58	A
Strontium-90	NR	487				341 - 633		



Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR					False Positive Test		
Uranium-234	NR	48.1				33.7 - 62.5		
Uranium-238	NR	128				90 - 166		
Zinc-65	524	470	A		11.5	329 - 611	14	A

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

*Laboratory Results For MAPEP-20-MaS43*

(TMAO01) EBERLINE SERVICES OAK RIDGE LABORATORY  
601 SCARBORO RD  
OAK RIDGE, TN 37830-

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	53				37 - 69		
Arsenic	NR	16.7				11.7 - 21.7		
Barium	NR	275				193 - 358		
Beryllium	NR	40.5				28.4 - 52.7		
Cadmium	NR	9.71				6.80 - 12.62		
Chromium	NR	109.2				76.4 - 142.0		
Cobalt	NR	109.2				76.4 - 142.0		
Copper	NR	163				114 - 212		
Lead	NR	51.0				35.7 - 66.3		
Mercury	NR	0.630				0.441 - 0.819		
Nickel	NR	238				167 - 309		
Selenium	NR	8.03				5.62 - 10.44		
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	NR	43.1				30.2 - 56.0		
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	NR	153				107 - 199		
Zinc	NR	280				196 - 364		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	.006		A			False Positive Test	1.413	
Cesium-134	862.266	710	W		21.4	497 - 923	31.86	A
Cesium-137	.02		A			False Positive Test	7.419	
Cobalt-57	1174.484	1100	A		6.8	770 - 1430	63.766	A
Cobalt-60	987.419	1000	A		-1.3	700 - 1300	56.999	A
Iron-55	NR	577				404 - 750		
Manganese-54	634.23	610	A		4.0	427 - 793	54.31	A
Nickel-63	719.274	980	W		-26.6	686 - 1274	107.355	A
Plutonium-238	52.269	57.7	A		-9.4	40.4 - 75.0	9.354	W
Plutonium-239/240	78.089	79	A		-1.2	55 - 103	11.691	A
Potassium-40	621.557	622	A		-0.1	435 - 809	73.922	A
Strontium-90	466.848	487	A		-4.1	341 - 633	23.765	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	106.033		N	(1)		False Positive Test	22.05	
Uranium-234	60.311	48.1	W		25.4	33.7 - 62.5	9.069	W
Uranium-238	126.962	128	A		-0.8	90 - 166	14.701	A
Zinc-65	510.489	470	A		8.6	329 - 611	51.039	A

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

Laboratory Results For MAPEP-20-MaS43  
 (TNUT01) St. Louis USACE FUSRAP Laboratory  
 112 James S McDonnell Blvd  
 HAZELWOOD, MO 63042

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	53				37 - 69		
Arsenic	NR	16.7				11.7 - 21.7		
Barium	NR	275				193 - 358		
Beryllium	NR	40.5				28.4 - 52.7		
Cadmium	NR	9.71				6.80 - 12.62		
Chromium	NR	109.2				76.4 - 142.0		
Cobalt	NR	109.2				76.4 - 142.0		
Copper	NR	163				114 - 212		
Lead	NR	51.0				35.7 - 66.3		
Mercury	NR	0.630				0.441 - 0.819		
Nickel	NR	238				167 - 309		
Selenium	NR	8.03				5.62 - 10.44		
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	NR	43.1				30.2 - 56.0		
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	NR	153				107 - 199		
Zinc	NR	280				196 - 364		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	-.989		A			False Positive Test	1.056	
Cesium-134	576.338	710	A		-18.8	497 - 923	7.387	N
Cesium-137	1.098		A			False Positive Test	.849	
Cobalt-57	1114.150	1100	A		1.3	770 - 1430	18.633	N
Cobalt-60	993.380	1000	A		-0.7	700 - 1300	17.918	N
Iron-55	NR	577				404 - 750		
Manganese-54	641.115	610	A		5.1	427 - 793	15.161	A
Nickel-63	NR	980				686 - 1274		
Plutonium-238	NR	57.7				40.4 - 75.0		
Plutonium-239/240	NR	79				55 - 103		
Potassium-40	682.023	622	A		9.7	435 - 809	20.821	A
Strontium-90	NR	487				341 - 633		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR					False Positive Test		
Uranium-234	51.695	48.1	A		7.5	33.7 - 62.5	7.392	A
Uranium-238	130.105	128	A		1.6	90 - 166	12.956	A
Zinc-65	518.255	470	A		10.3	329 - 611	12.967	A

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

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(28) = Not Reporting Previously Reported Analyte



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

Laboratory Results For MAPEP-20-MaS43

(UNTE01) UniTech-235

178 Aldo Drive

Barnwell, SC 29812

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	53				37 - 69		
Arsenic	NR	16.7				11.7 - 21.7		
Barium	NR	275				193 - 358		
Beryllium	NR	40.5				28.4 - 52.7		
Cadmium	NR	9.71				6.80 - 12.62		
Chromium	NR	109.2				76.4 - 142.0		
Cobalt	NR	109.2				76.4 - 142.0		
Copper	NR	163				114 - 212		
Lead	NR	51.0				35.7 - 66.3		
Mercury	NR	0.630				0.441 - 0.819		
Nickel	NR	238				167 - 309		
Selenium	NR	8.03				5.62 - 10.44		
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	NR	43.1				30.2 - 56.0		
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	NR	153				107 - 199		
Zinc	NR	280				196 - 364		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	864.69	710	W		21.8	497 - 923	36.21	A
Cesium-137	NR		N	(11)		False Positive Test		
Cobalt-57	1649.83	1100	N		50.0	770 - 1430	78.59	A
Cobalt-60	1367.89	1000	N		36.8	700 - 1300	53.13	A
Iron-55	NR	577				404 - 750		
Manganese-54	900.4	610	N		47.6	427 - 793	44.84	A
Nickel-63	NR	980				686 - 1274		
Plutonium-238	NR	57.7				40.4 - 75.0		
Plutonium-239/240	NR	79				55 - 103		
Potassium-40	933.88	622	N		50.1	435 - 809	79.40	A
Strontium-90	NR	487				341 - 633		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR					False Positive Test		
Uranium-234	NR	48.1				33.7 - 62.5		
Uranium-238	NR	128				90 - 166		
Zinc-65	711.33	470	N		51.3	329 - 611	53.41	A

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

*Laboratory Results For MAPEP-20-MaS43*

(WEST04) PACE ANALYTICAL SERVICES, PITTSBURGH

1638 Roseytown Road

Greensburg, PA 15601

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	53				37 - 69		
Arsenic	NR	16.7				11.7 - 21.7		
Barium	NR	275				193 - 358		
Beryllium	NR	40.5				28.4 - 52.7		
Cadmium	NR	9.71				6.80 - 12.62		
Chromium	NR	109.2				76.4 - 142.0		
Cobalt	NR	109.2				76.4 - 142.0		
Copper	NR	163				114 - 212		
Lead	NR	51.0				35.7 - 66.3		
Mercury	NR	0.630				0.441 - 0.819		
Nickel	NR	238				167 - 309		
Selenium	NR	8.03				5.62 - 10.44		
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	NR	43.1				30.2 - 56.0		
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	NR	153				107 - 199		
Zinc	NR	280				196 - 364		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.52		A			False Positive Test	0.78	
Cesium-134	729.63	710	A		2.8	497 - 923	97.13	A
Cesium-137	0.0001		A			False Positive Test	1.05	
Cobalt-57	1198.9	1100	A		9.0	770 - 1430	161.4	A
Cobalt-60	1051.6	1000	A		5.2	700 - 1300	137.9	A
Iron-55	385.58	577	N		-33.2	404 - 750	150.78	N
Manganese-54	686.78	610	A		12.6	427 - 793	91.31	A
Nickel-63	991.49	980	A		1.2	686 - 1274	96.68	A
Plutonium-238	56.61	57.7	A		-1.9	40.4 - 75.0	10.03	W
Plutonium-239/240	72.15	79	A		-8.7	55 - 103	12.32	W
Potassium-40	707.38	622	A		13.7	435 - 809	94.90	A
Strontium-90	404.78	487	A		-16.9	341 - 633	65.86	W



Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	3.22		A			False Positive Test	13.25	
Uranium-234	38.85	48.1	A		-19.2	33.7 - 62.5	12.36	N
Uranium-238	112.85	128	A		-11.8	90 - 166	26.97	W
Zinc-65	539.62	470	A		14.8	329 - 611	71.05	A

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

Laboratory Results For MAPEP-20-MaS43  
 (WIPH01) WI, DPH, Radiation Protection Section  
 1 West Wilson Street  
 Madison, WI 53701

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	53				37 - 69		
Arsenic	NR	16.7				11.7 - 21.7		
Barium	NR	275				193 - 358		
Beryllium	NR	40.5				28.4 - 52.7		
Cadmium	NR	9.71				6.80 - 12.62		
Chromium	NR	109.2				76.4 - 142.0		
Cobalt	NR	109.2				76.4 - 142.0		
Copper	NR	163				114 - 212		
Lead	NR	51.0				35.7 - 66.3		
Mercury	NR	0.630				0.441 - 0.819		
Nickel	NR	238				167 - 309		
Selenium	NR	8.03				5.62 - 10.44		
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	NR	43.1				30.2 - 56.0		
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	NR	153				107 - 199		
Zinc	NR	280				196 - 364		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	-4.38		A			False Positive Test	3.96	
Cesium-134	678.27	710	A		-4.5	497 - 923	7.569	N
Cesium-137	1.77		A			False Positive Test	0.999	
Cobalt-57	1158.37	1100	A		5.3	770 - 1430	23.263	A
Cobalt-60	1037.04	1000	A		3.7	700 - 1300	17.039	N
Iron-55	NR	577				404 - 750		
Manganese-54	661.18	610	A		8.4	427 - 793	14.721	A
Nickel-63	NR	980				686 - 1274		
Plutonium-238	NR	57.7				40.4 - 75.0		
Plutonium-239/240	NR	79				55 - 103		
Potassium-40	674.66	622	A		8.5	435 - 809	19.169	A
Strontium-90	NR	487				341 - 633		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR					False Positive Test		
Uranium-234	NR	48.1				33.7 - 62.5		
Uranium-238	NR	128				90 - 166		
Zinc-65	515.56	470	A		9.7	329 - 611	13.075	A

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

*Laboratory Results For MAPEP-20-MaS43*

(WIPP01) WIPP Laboratories

1400 University Drive

Carlsbad, NM 88220

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	53				37 - 69		
Arsenic	NR	16.7				11.7 - 21.7		
Barium	NR	275				193 - 358		
Beryllium	NR	40.5				28.4 - 52.7		
Cadmium	NR	9.71				6.80 - 12.62		
Chromium	NR	109.2				76.4 - 142.0		
Cobalt	NR	109.2				76.4 - 142.0		
Copper	NR	163				114 - 212		
Lead	NR	51.0				35.7 - 66.3		
Mercury	NR	0.630				0.441 - 0.819		
Nickel	NR	238				167 - 309		
Selenium	NR	8.03				5.62 - 10.44		
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	NR	43.1				30.2 - 56.0		
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	NR	153				107 - 199		
Zinc	NR	280				196 - 364		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	.321		A			False Positive Test	.256	
Cesium-134	721	710	A		1.5	497 - 923	9.01	N
Cesium-137	1.34		A			False Positive Test	.777	
Cobalt-57	1290	1100	A		17.3	770 - 1430	27.6	A
Cobalt-60	1060	1000	A		6.0	700 - 1300	13.8	N
Iron-55	NR	577				404 - 750		
Manganese-54	677	610	A		11.0	427 - 793	6.9	N
Nickel-63	NR	980				686 - 1274		
Plutonium-238	57.8	57.7	A		0.2	40.4 - 75.0	5.33	A
Plutonium-239/240	81.6	79	A		3.3	55 - 103	7.24	A
Potassium-40	672	622	A		8.0	435 - 809	17.4	A
Strontium-90	464	487	A		-4.7	341 - 633	37.6	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR					False Positive Test		
Uranium-234	43	48.1	A		-10.6	33.7 - 62.5	6.18	A
Uranium-238	123	128	A		-3.9	90 - 166	16.5	A
Zinc-65	528	470	A		12.3	329 - 611	6.97	N

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

Laboratory Results For MAPEP-20-MaS43  
 (WSHL01) Wisconsin State Laboratory of Hygiene  
 2601 Agriculture Drive  
 Madison, WI 53718

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	53				37 - 69		
Arsenic	NR	16.7				11.7 - 21.7		
Barium	NR	275				193 - 358		
Beryllium	NR	40.5				28.4 - 52.7		
Cadmium	NR	9.71				6.80 - 12.62		
Chromium	NR	109.2				76.4 - 142.0		
Cobalt	NR	109.2				76.4 - 142.0		
Copper	NR	163				114 - 212		
Lead	NR	51.0				35.7 - 66.3		
Mercury	NR	0.630				0.441 - 0.819		
Nickel	NR	238				167 - 309		
Selenium	NR	8.03				5.62 - 10.44		
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	NR	43.1				30.2 - 56.0		
Uranium-235	NR	0.0343				0.0240 - 0.0446		
Uranium-238	NR	10.3				7.2 - 13.4		
Uranium-Total	NR	10.3				7.2 - 13.4		
Vanadium	NR	153				107 - 199		
Zinc	NR	280				196 - 364		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	727	710	A		2.4	497 - 923	13.1	N
Cesium-137	1.14		A			False Positive Test	0.692	
Cobalt-57	1200	1100	A		9.1	770 - 1430	25.9	A
Cobalt-60	1040	1000	A		4.0	700 - 1300	57.4	A
Iron-55	NR	577				404 - 750		
Manganese-54	643	610	A		5.4	427 - 793	27	A
Nickel-63	NR	980				686 - 1274		
Plutonium-238	NR	57.7				40.4 - 75.0		
Plutonium-239/240	NR	79				55 - 103		
Potassium-40	644	622	A		3.5	435 - 809	52.2	A
Strontium-90	445.17	487	A		-8.6	341 - 633	34.54	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR					False Positive Test		
Uranium-234	NR	48.1				33.7 - 62.5		
Uranium-238	NR	128				90 - 166		
Zinc-65	513	470	A		9.1	329 - 611	37.3	A

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte



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

*Laboratory Results For MAPEP-20-MaS43*

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

301 C. Street

Yuma, AZ 85365

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	53				37 - 69		
Arsenic	NR	16.7				11.7 - 21.7		
Barium	NR	275				193 - 358		
Beryllium	NR	40.5				28.4 - 52.7		
Cadmium	NR	9.71				6.80 - 12.62		
Chromium	NR	109.2				76.4 - 142.0		
Cobalt	NR	109.2				76.4 - 142.0		
Copper	NR	163				114 - 212		
Lead	NR	51.0				35.7 - 66.3		
Mercury	NR	0.630				0.441 - 0.819		
Nickel	NR	238				167 - 309		
Selenium	NR	8.03				5.62 - 10.44		
Silver	NR	84.9				59.4 - 110.4		
Technetium-99	NR					False Positive Test		
Thallium	NR	43.1				30.2 - 56.0		
Uranium-235	0.036	0.0343	A		5.0	0.0240 - 0.0446	0.018	N
Uranium-238	10.87	10.3	A		5.5	7.2 - 13.4	1.8	W
Uranium-Total	10.9	10.3	A		5.8	7.2 - 13.4	1.8	W
Vanadium	NR	153				107 - 199		
Zinc	NR	280				196 - 364		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR					False Positive Test		
Cesium-134	NR	710				497 - 923		
Cesium-137	NR					False Positive Test		
Cobalt-57	NR	1100				770 - 1430		
Cobalt-60	NR	1000				700 - 1300		
Iron-55	NR	577				404 - 750		
Manganese-54	NR	610				427 - 793		
Nickel-63	NR	980				686 - 1274		
Plutonium-238	NR	57.7				40.4 - 75.0		
Plutonium-239/240	NR	79				55 - 103		
Potassium-40	NR	622				435 - 809		
Strontium-90	NR	487				341 - 633		



Radiological						Units: (Bq/kg)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR					False Positive Test		
Uranium-234	NR	48.1				33.7 - 62.5		
Uranium-238	NR	128				90 - 166		
Zinc-65	NR	470				329 - 611		

Radiological Reference Date: August 1, 2020

**Results Flags:**

A = Result acceptable Bias <=20%

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

N = Result not acceptable Bias > 30%

RW = Report Warning

NR = Not Reported

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP<2%

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

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

NOT ACCEPTABLE.....RP>30%

RP = Relative Precision

**Notes:**

(1) = False Positive

(5) = Total Metal

(6) = Not Evaluated

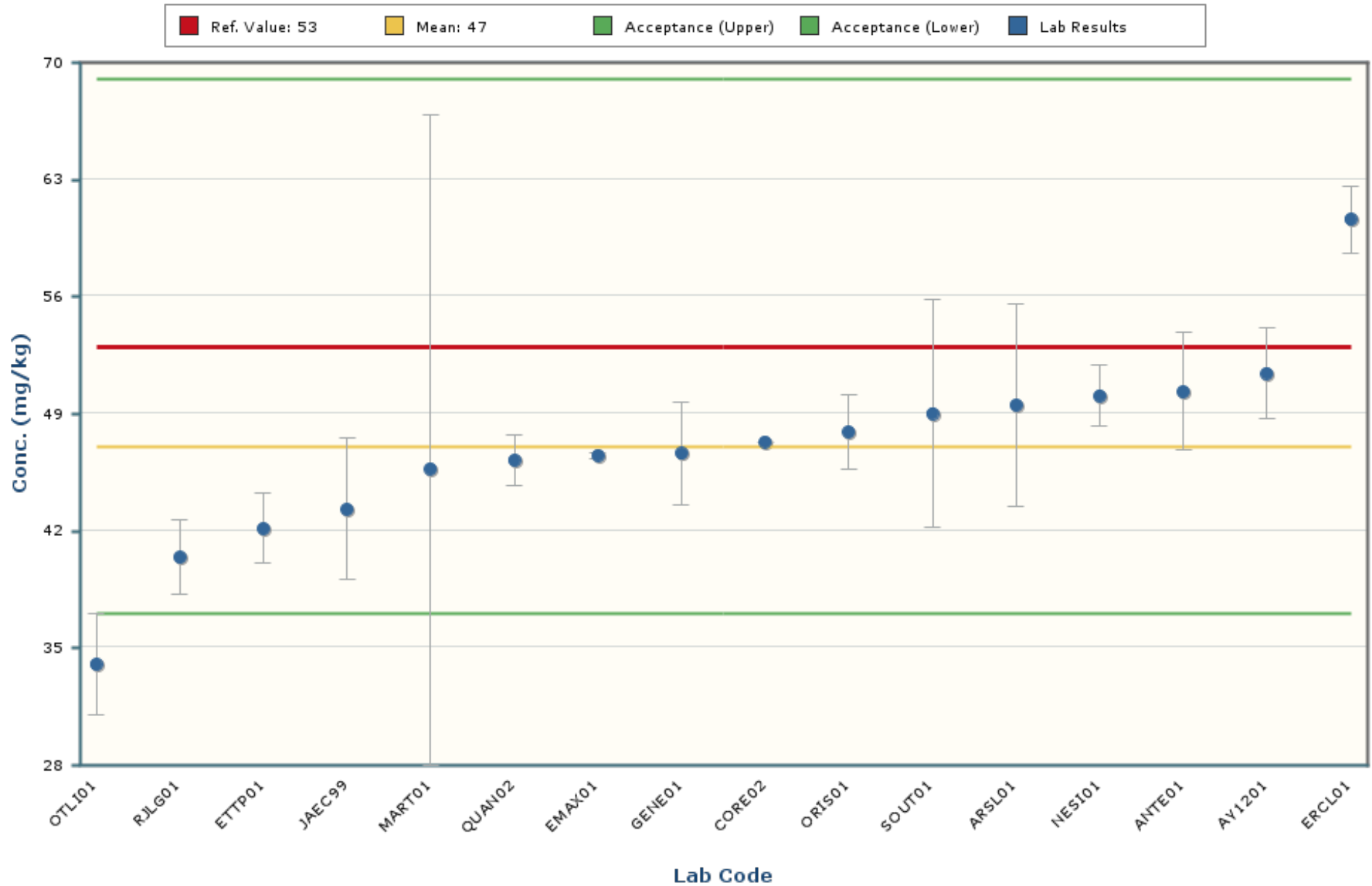
(11) = False Positive Test, Result Not Reported

(25) = Result not reported with other gamma results

(28) = Not Reporting Previously Reported Analyte

# Antimony

## MAPEP-20-MaS43



### Notes:

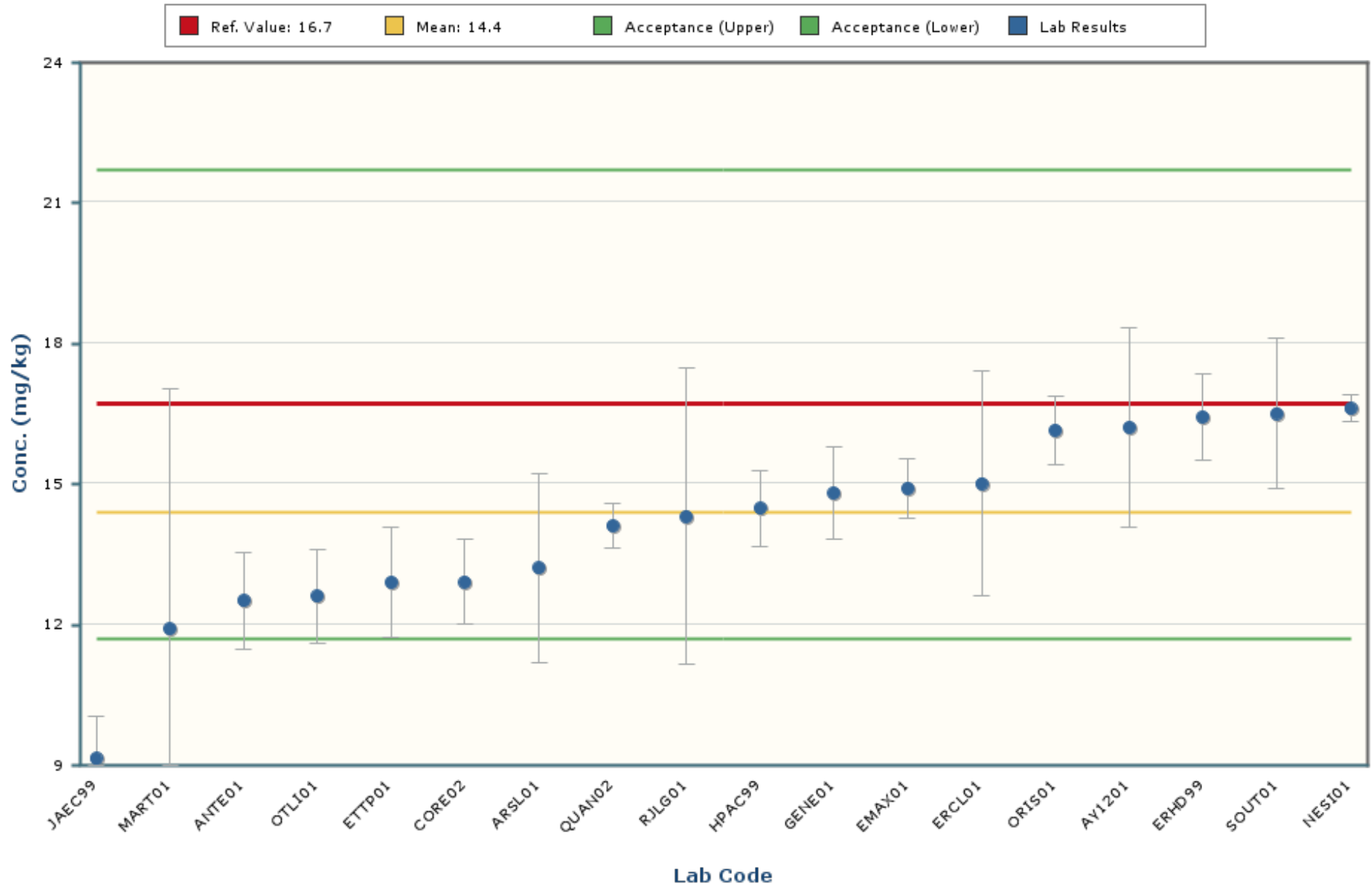
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 31 and 63 ( $\pm 5$  Standard Deviations).

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

# Arsenic

## MAPEP-20-MaS43



### Notes:

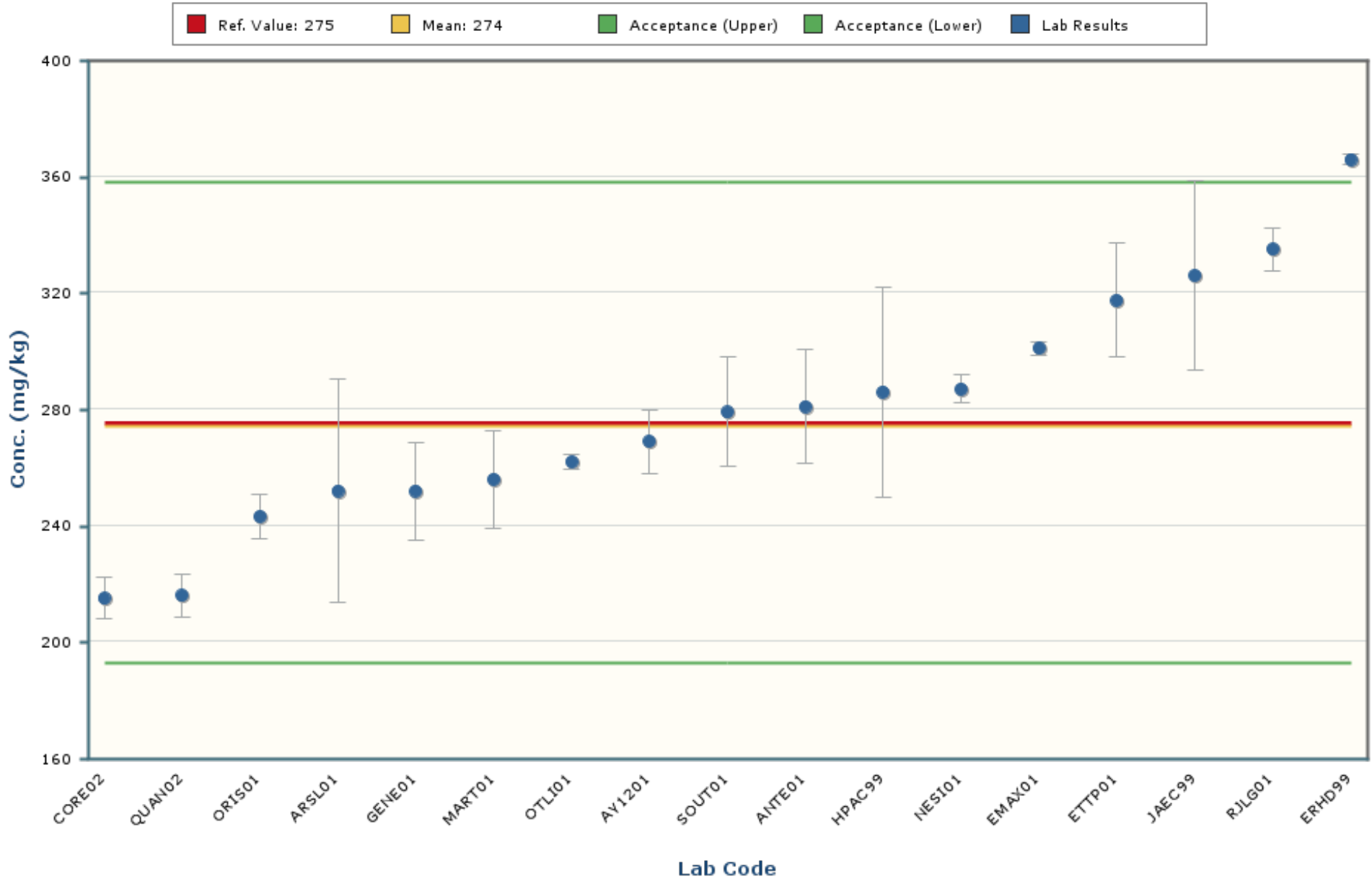
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 6.3 and 22.5 ( $\pm 5$  Standard Deviations).

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

# Barium

## MAPEP-20-MaS43



### Notes:

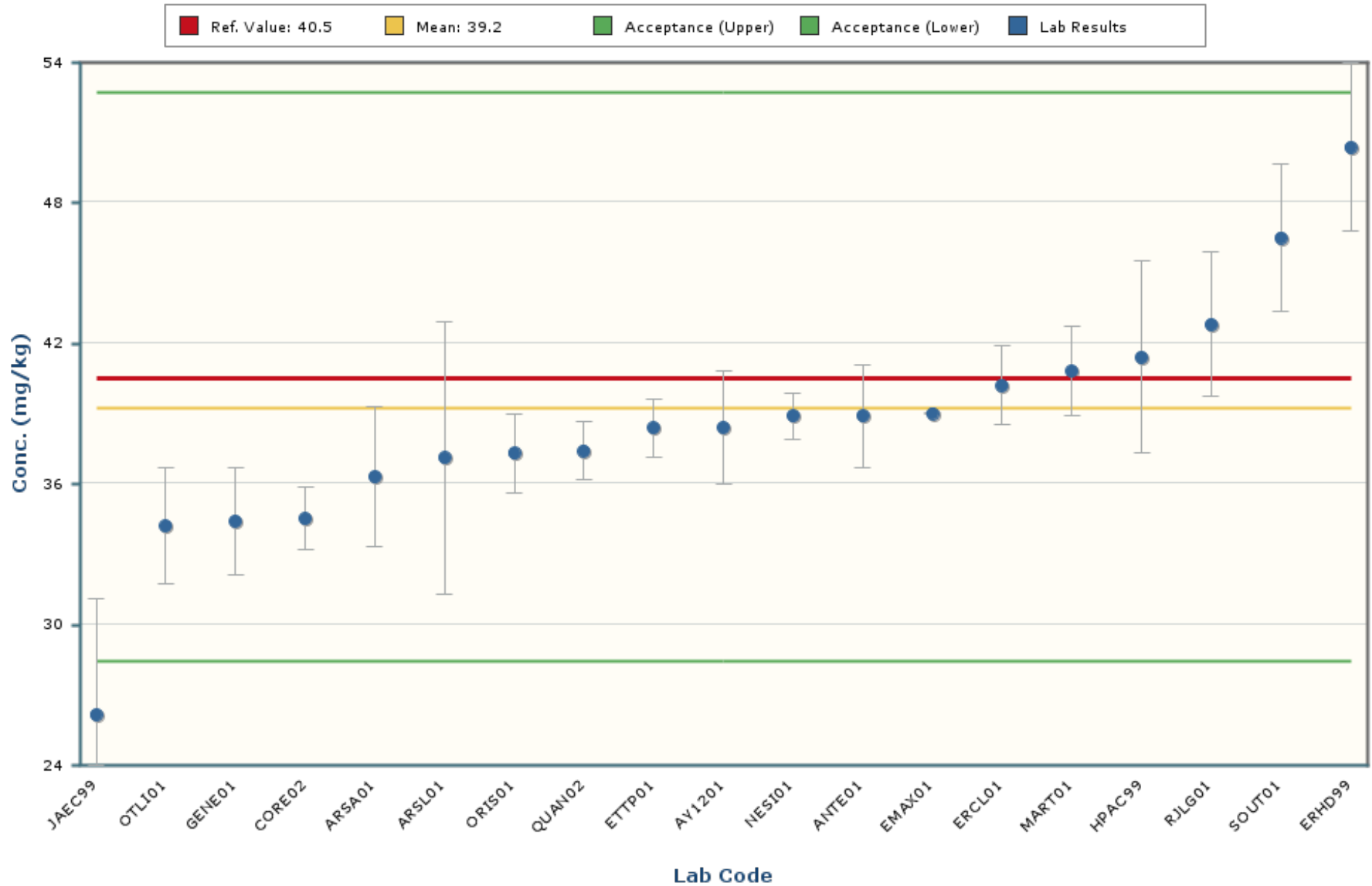
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 97 and 450 ( $\pm 5$  Standard Deviations).

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

# Beryllium

## MAPEP-20-MaS43



### Notes:

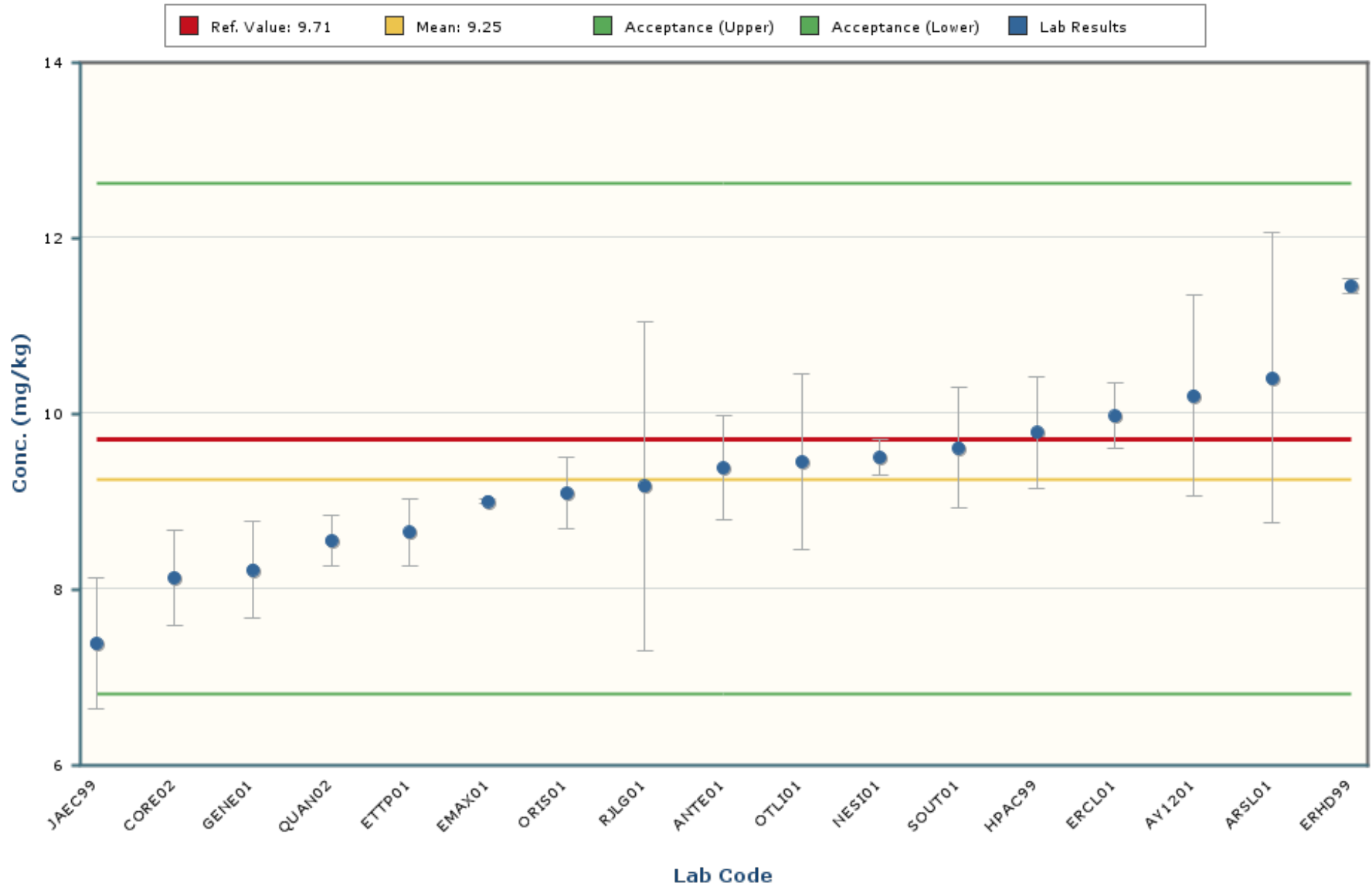
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 17.9 and 60.5 ( $\pm 5$  Standard Deviations).

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

# Cadmium

## MAPEP-20-MaS43



### Notes:

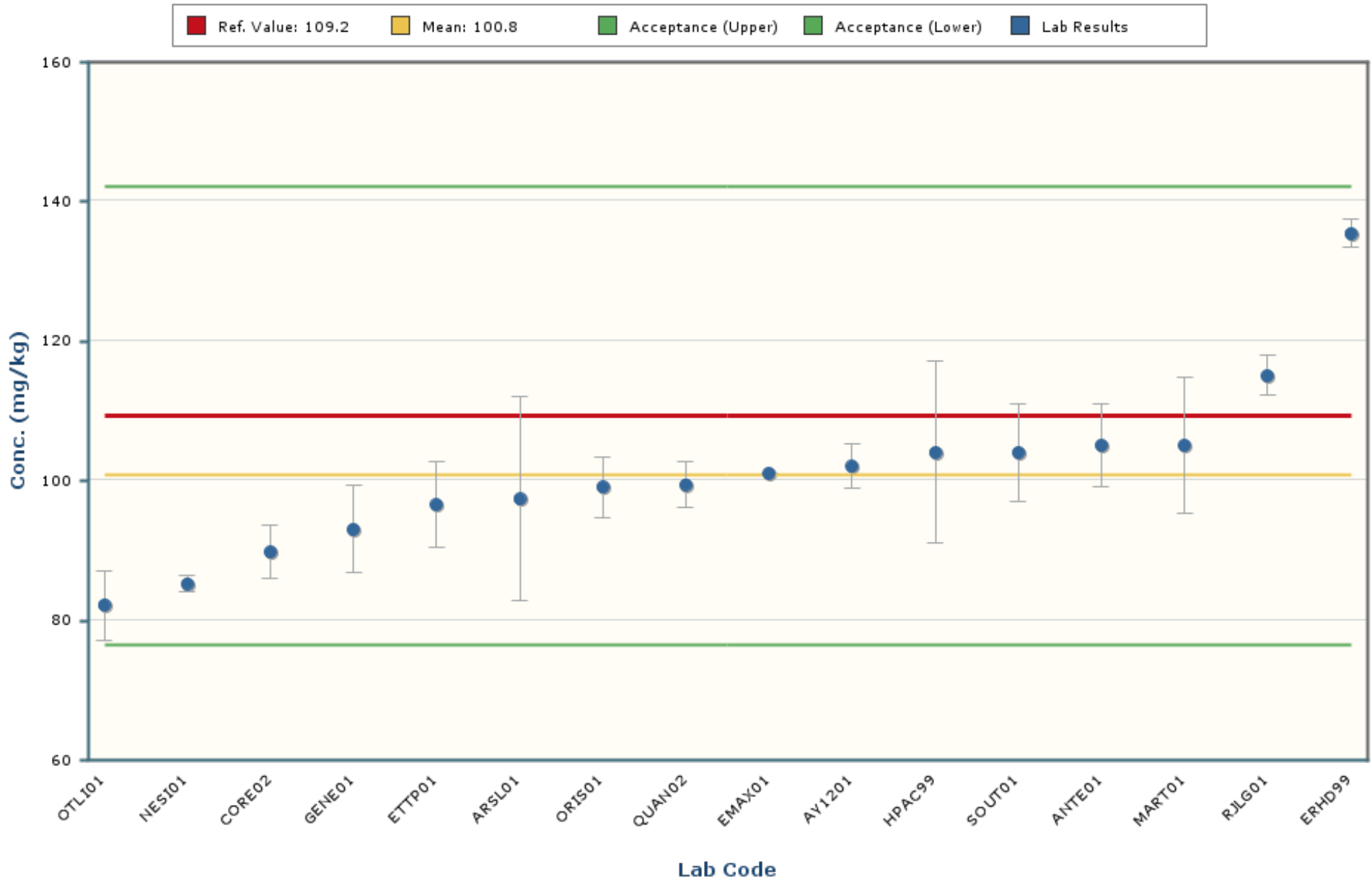
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 4.36 and 14.14 ( $\pm 5$  Standard Deviations).

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

# Chromium

## MAPEP-20-MaS43



### Notes:

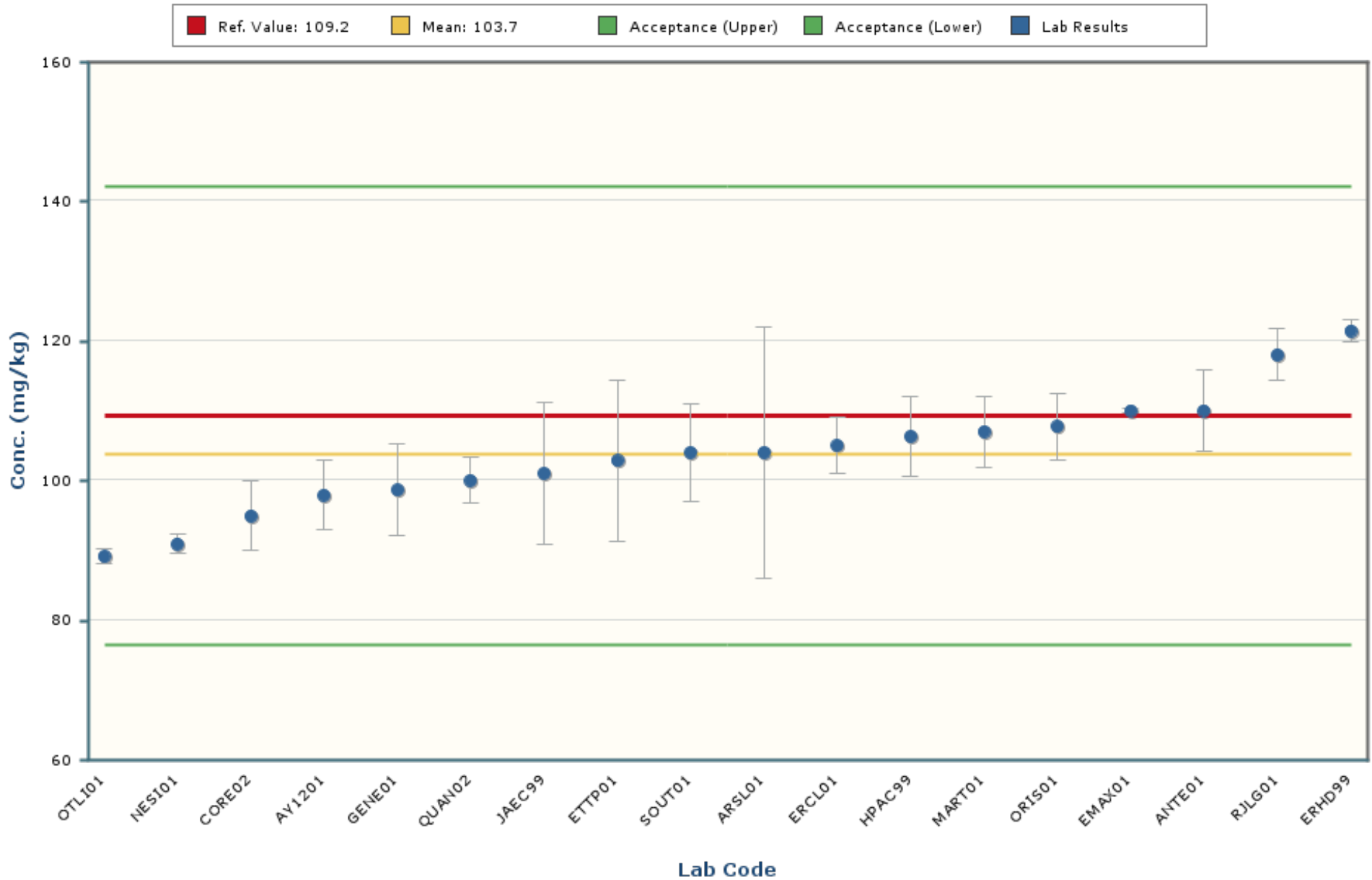
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 39.4 and 162.3 ( $\pm 5$  Standard Deviations).

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

# Cobalt

## MAPEP-20-MaS43



### Notes:

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

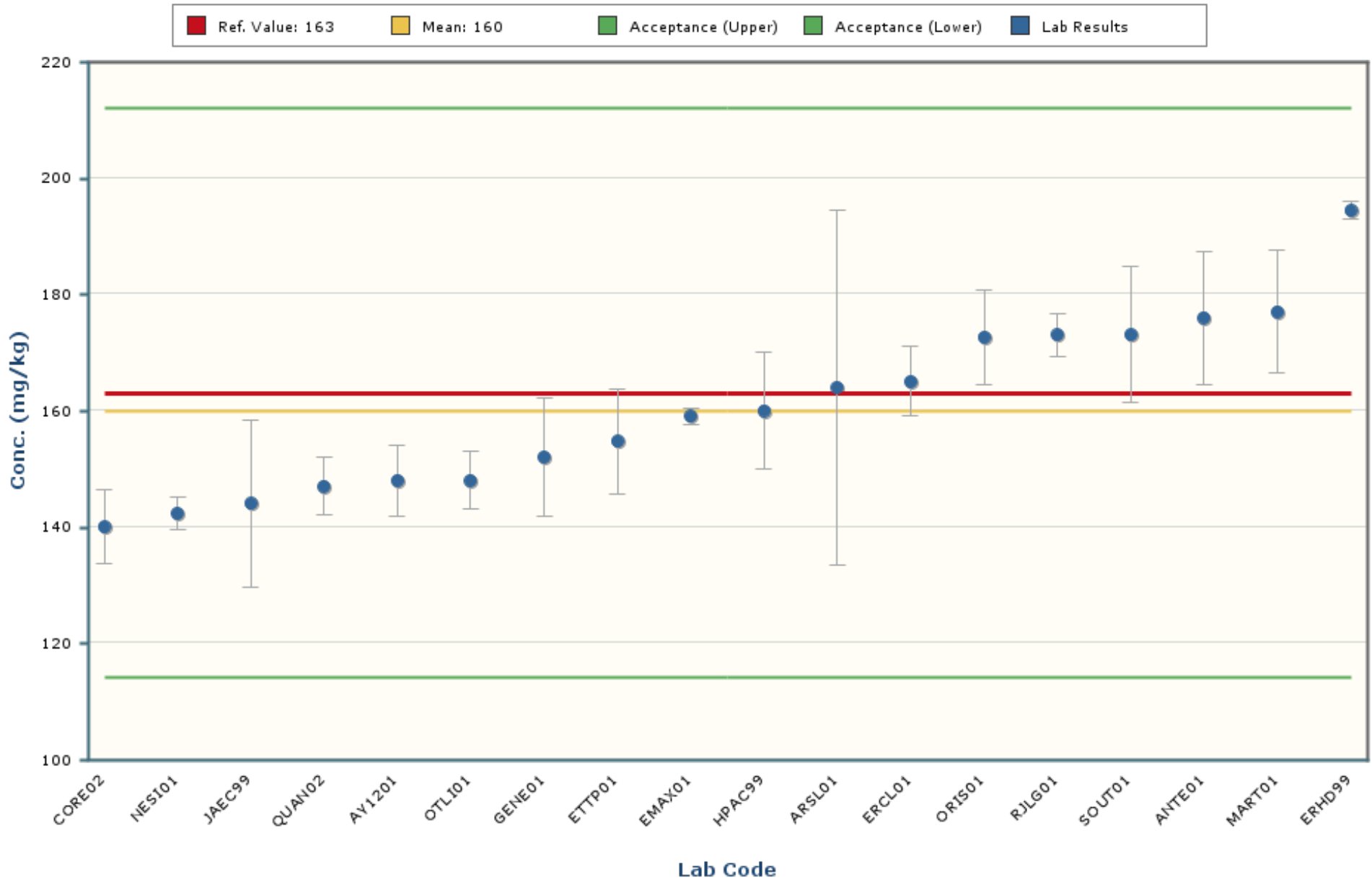
The chart shows only data points with values between 61.0 and 146.5 ( $\pm 5$  Standard Deviations).

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



# Copper

## MAPEP-20-MaS43



### Notes:

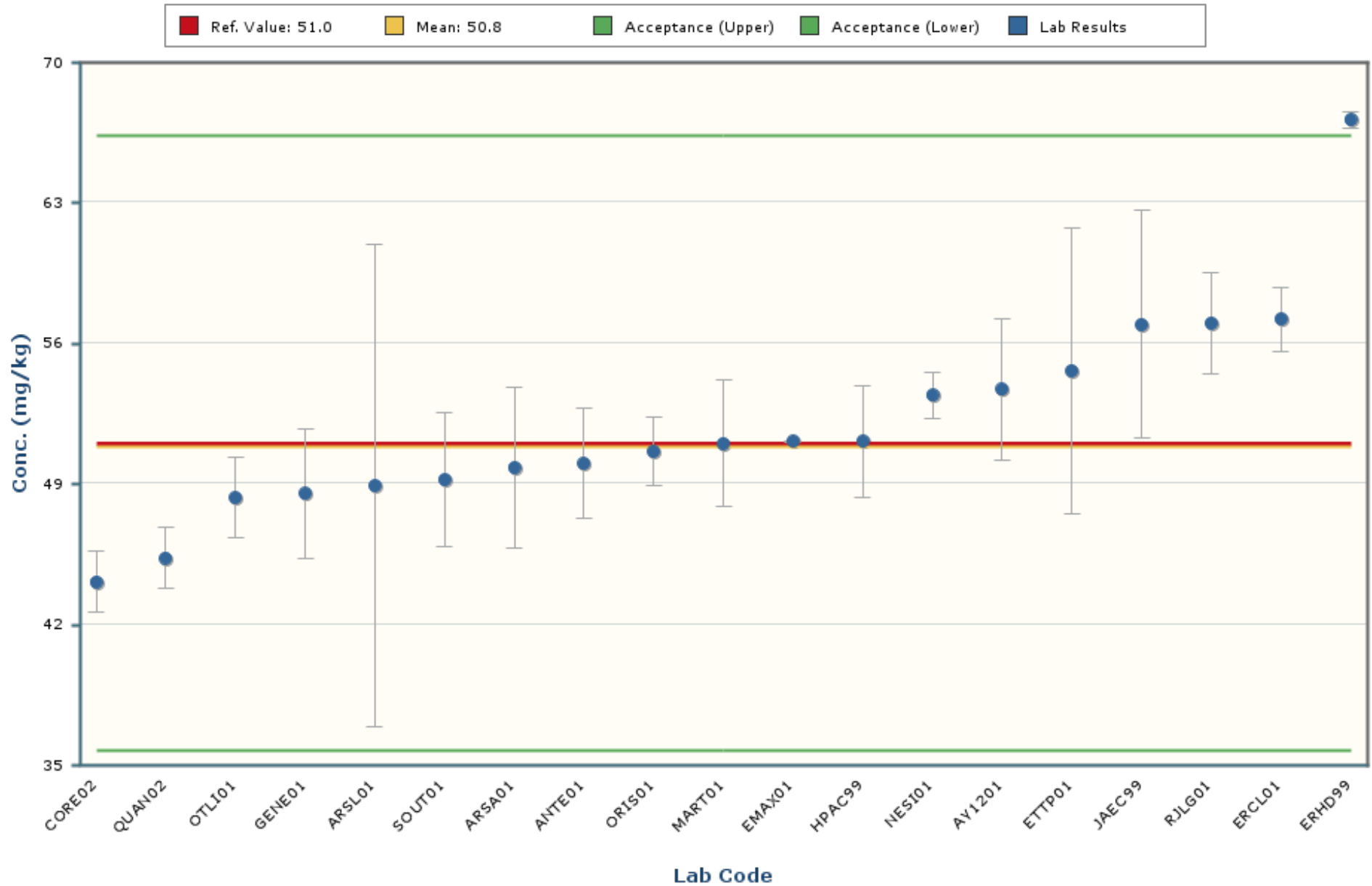
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 84 and 237 ( $\pm 5$  Standard Deviations).

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

# Lead

## MAPEP-20-MaS43



### Notes:

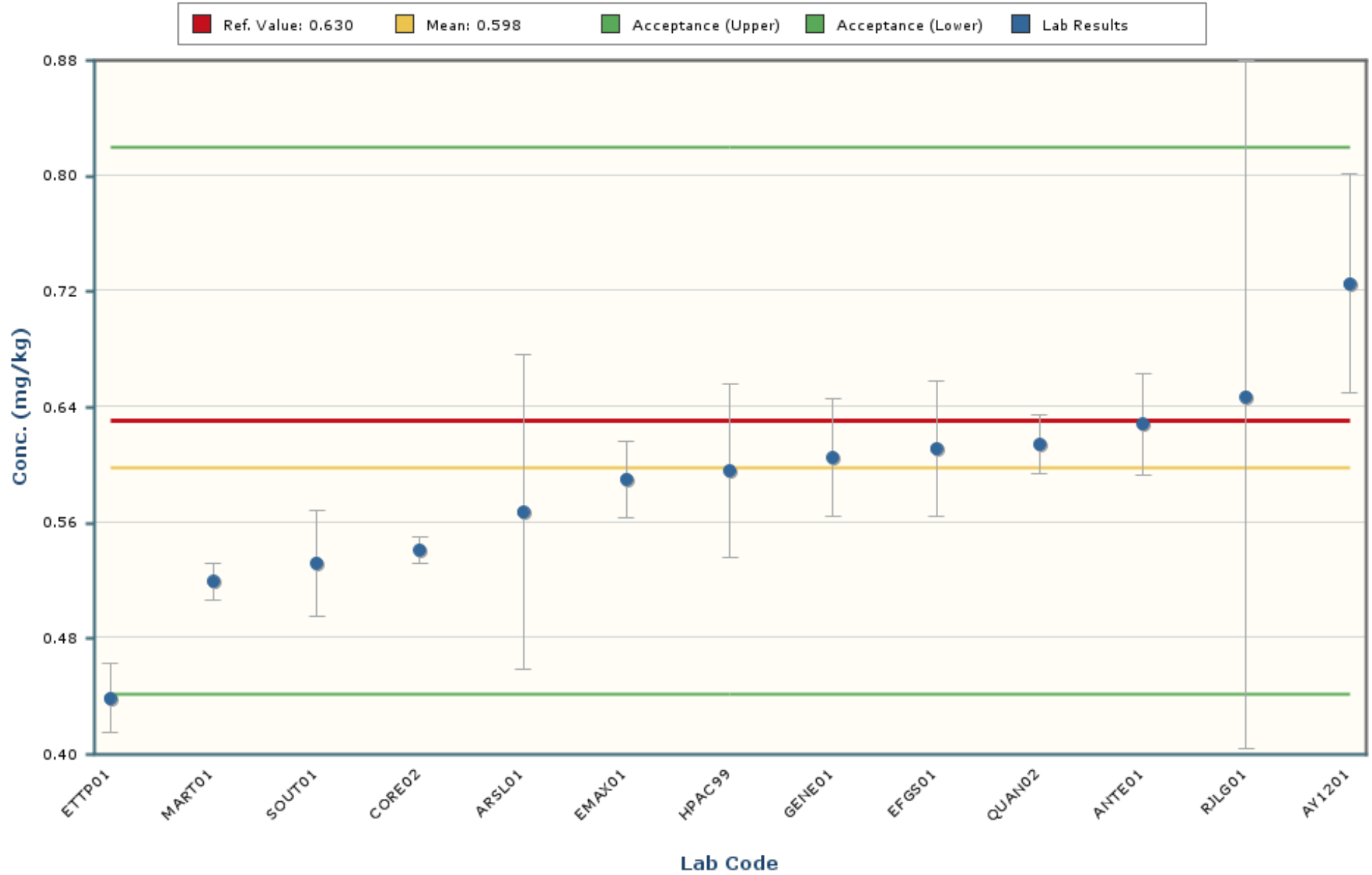
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 33.1 and 68.5 ( $\pm 5$  Standard Deviations).

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

# Mercury

## MAPEP-20-MaS43



### Notes:

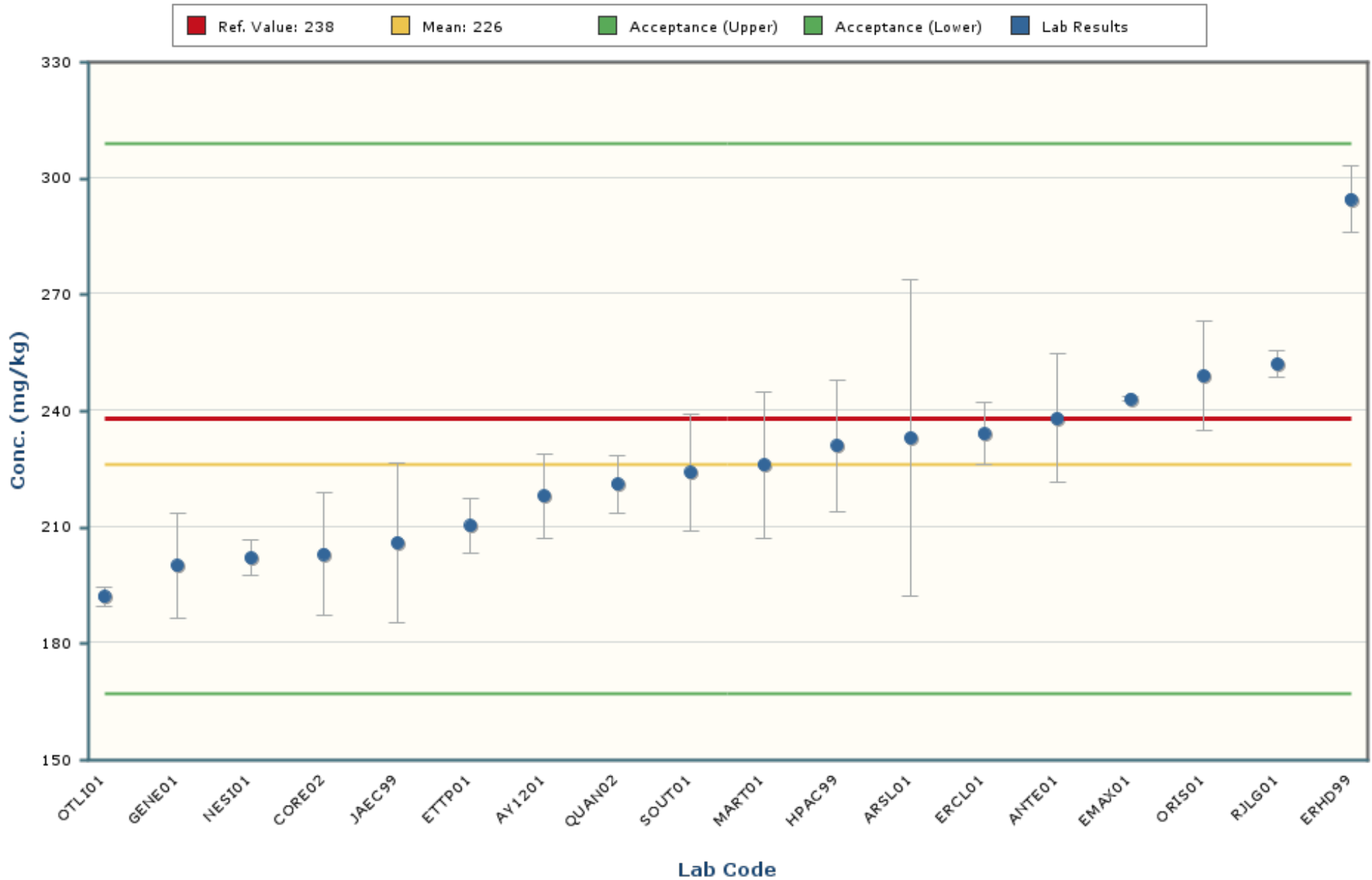
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 0.317 and 0.879 ( $\pm 5$  Standard Deviations).

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

# Nickel

## MAPEP-20-MaS43



### Notes:

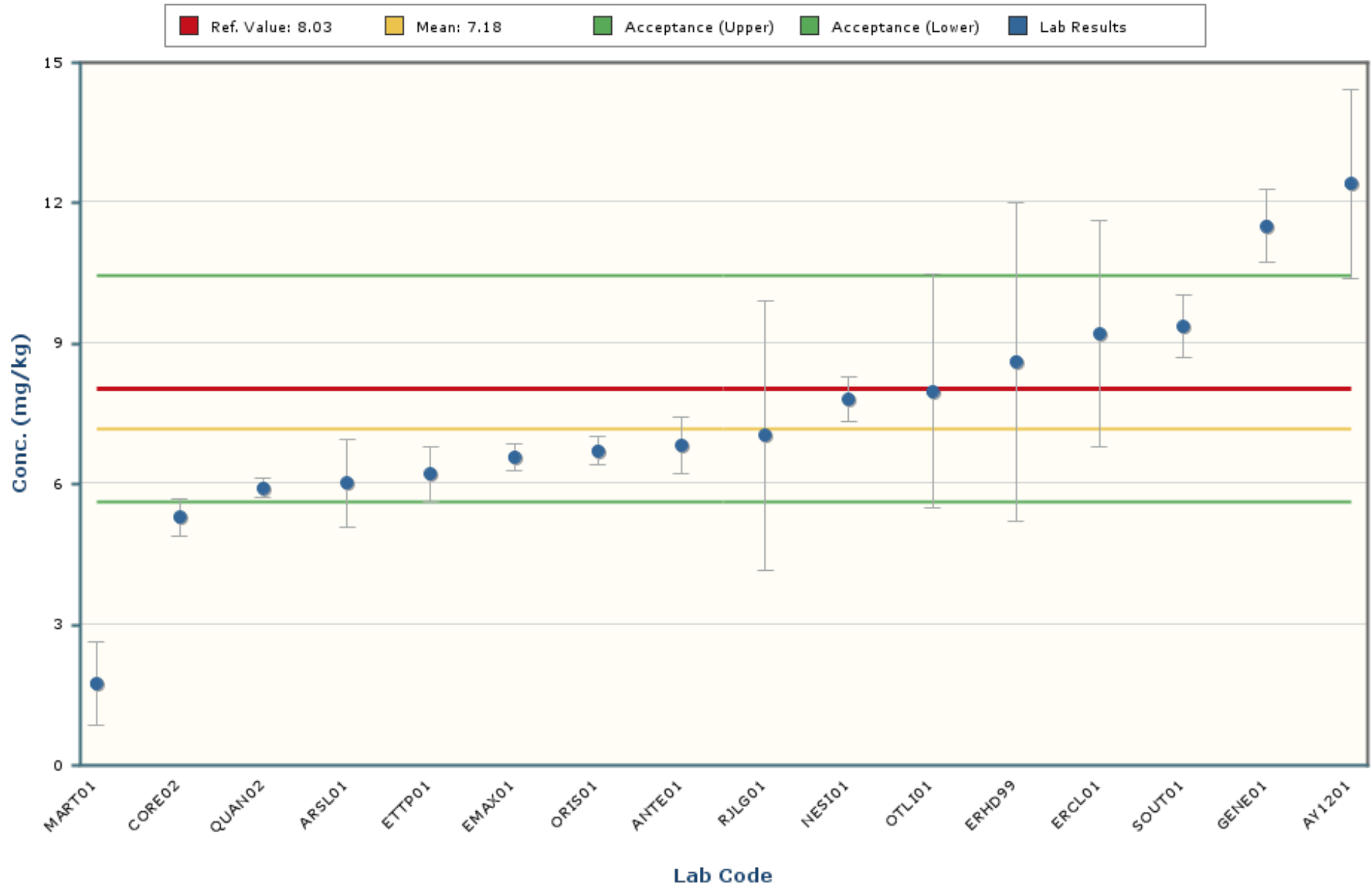
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 101 and 352 ( $\pm 5$  Standard Deviations).

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

# Selenium

## MAPEP-20-MaS43



### Notes:

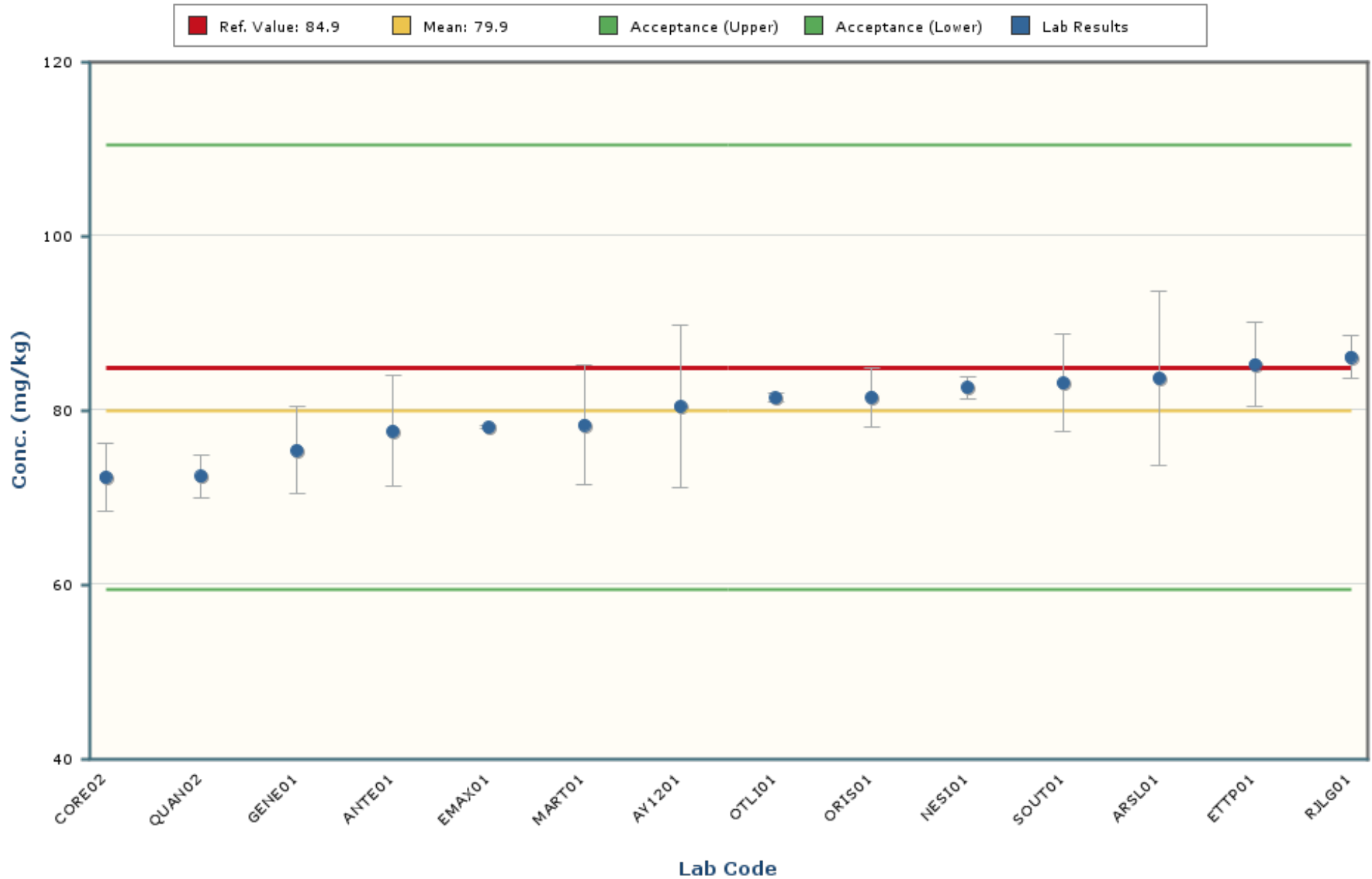
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 1.60 and 12.76 ( $\pm 5$  Standard Deviations).

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

# Silver

## MAPEP-20-MaS43



### Notes:

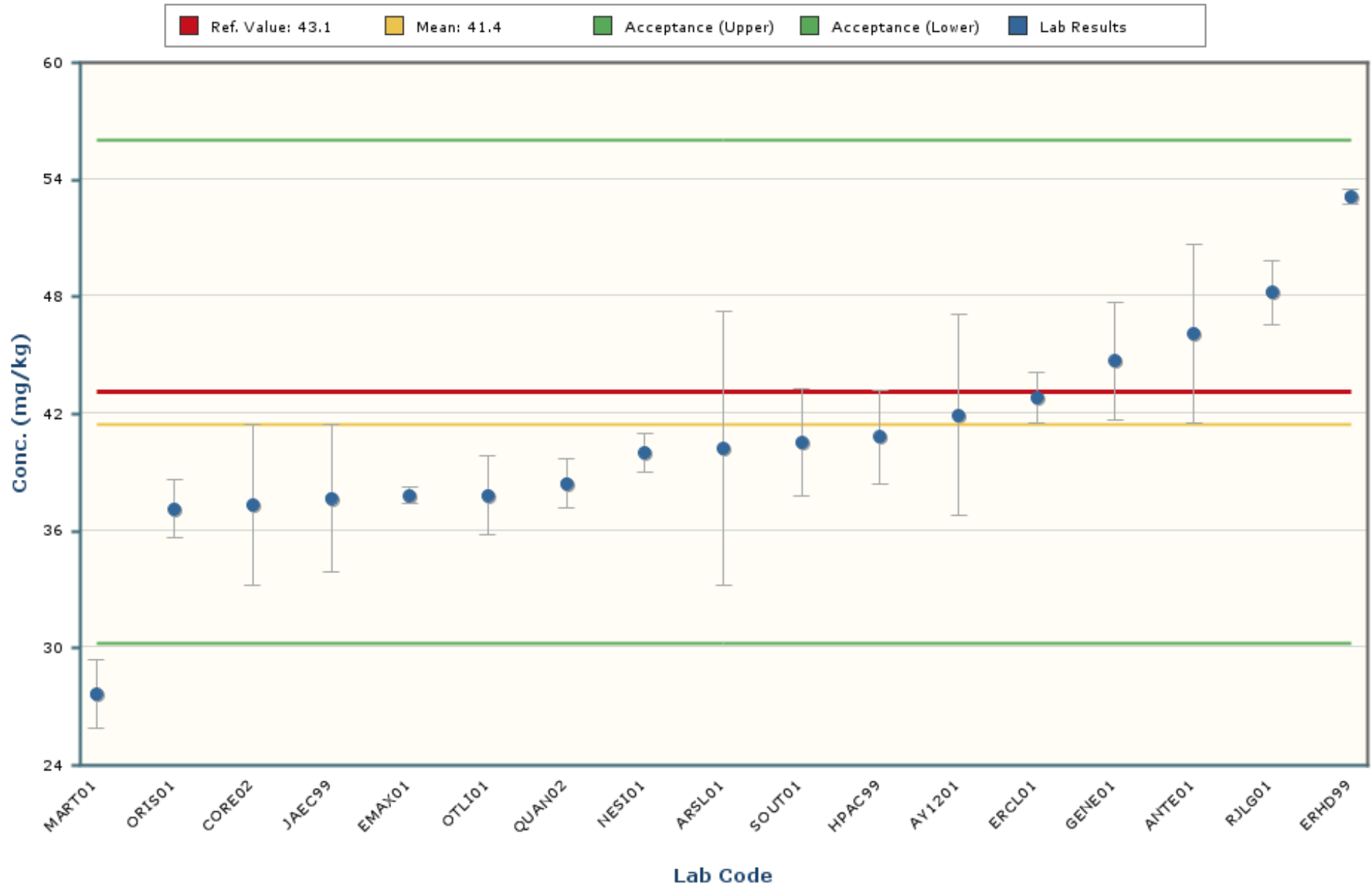
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 57.9 and 101.8 ( $\pm 5$  Standard Deviations).

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

# Thallium

## MAPEP-20-MaS43



### Notes:

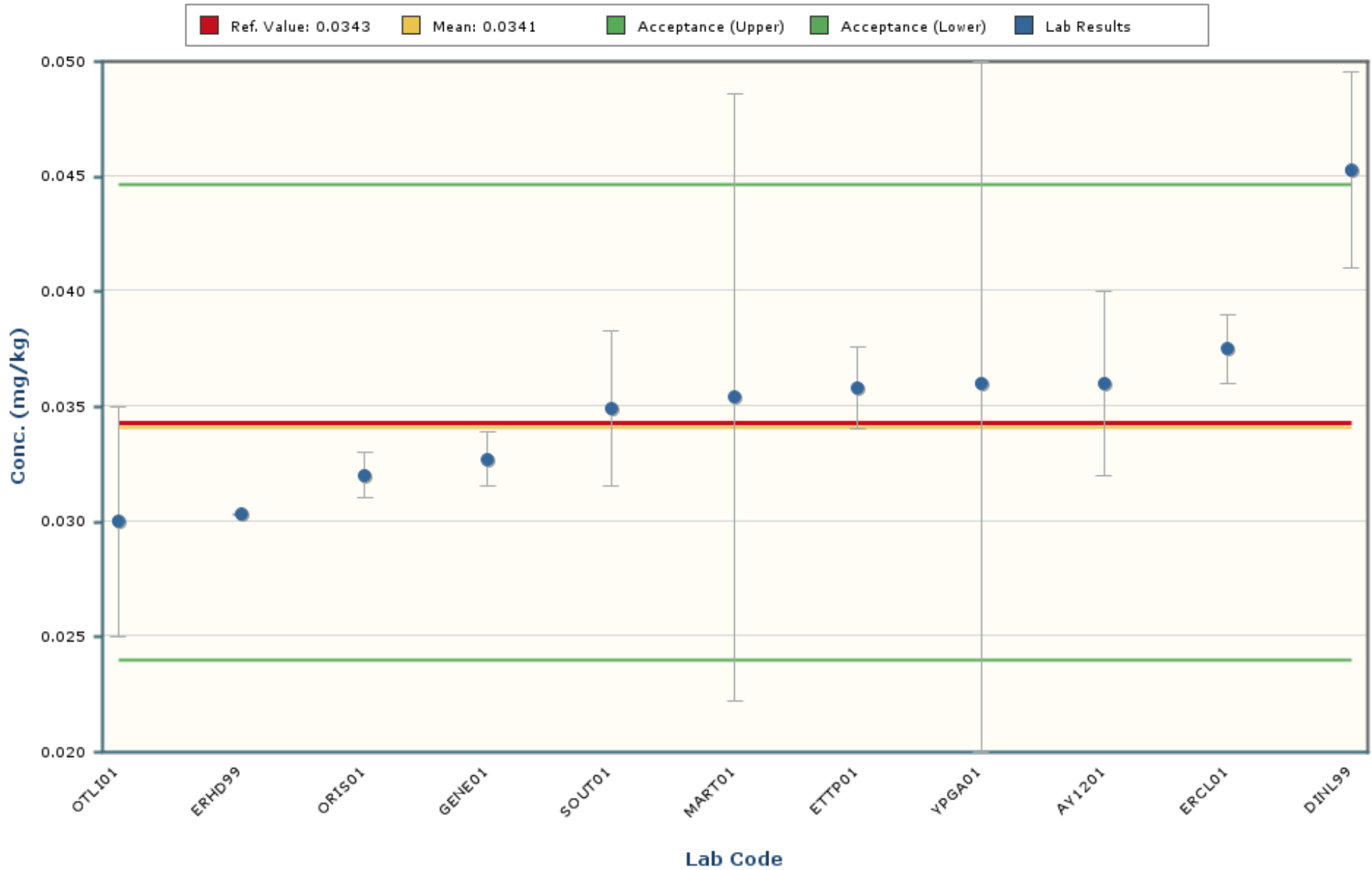
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 18.1 and 64.8 ( $\pm 5$  Standard Deviations).

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

# Uranium-235

## MAPEP-20-MaS43



### Notes:

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

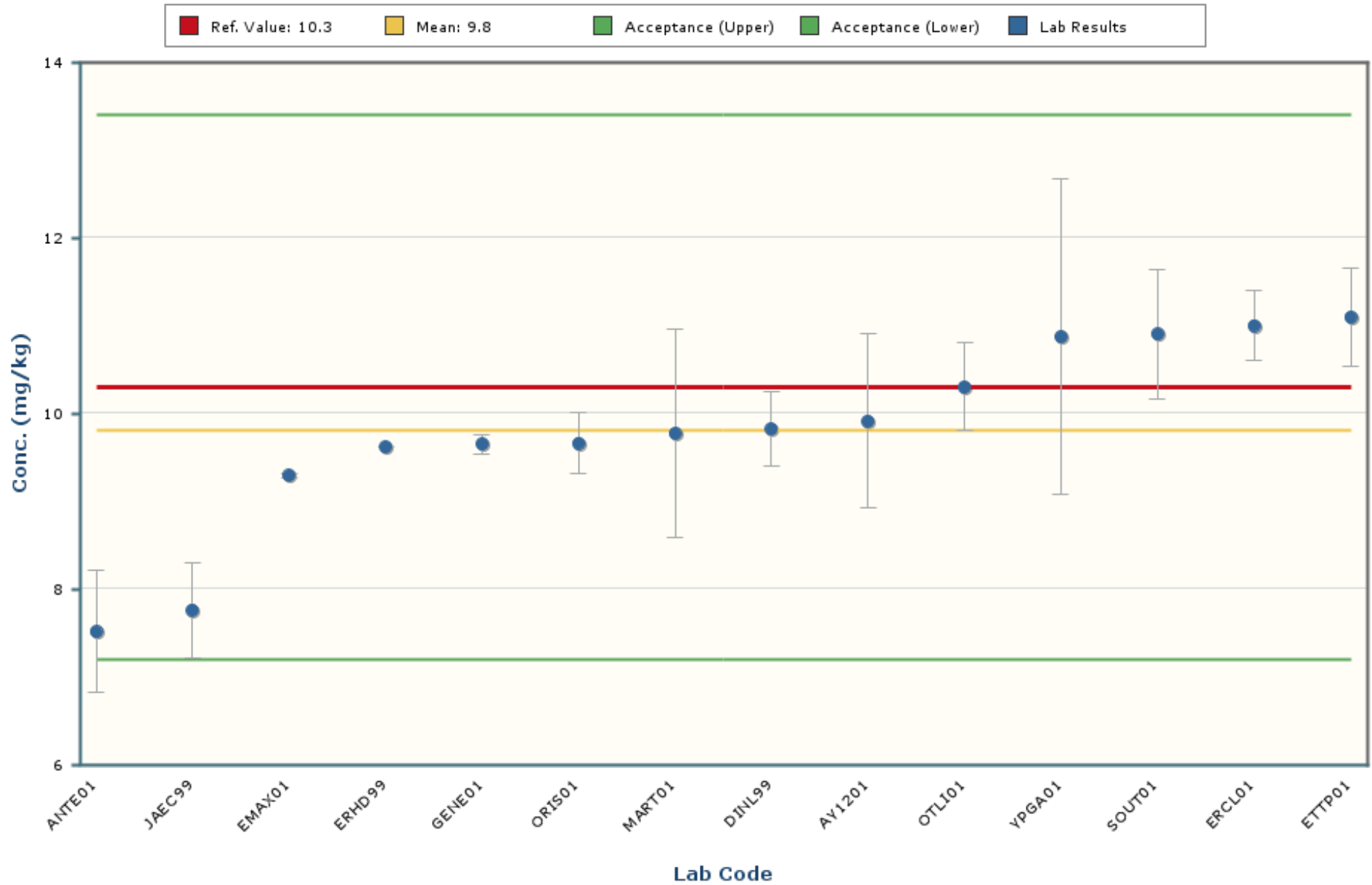
The chart shows only data points with values between 0.0210 and 0.0471 ( $\pm 5$  Standard Deviations).

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



# Uranium-238

## MAPEP-20-MaS43



### Notes:

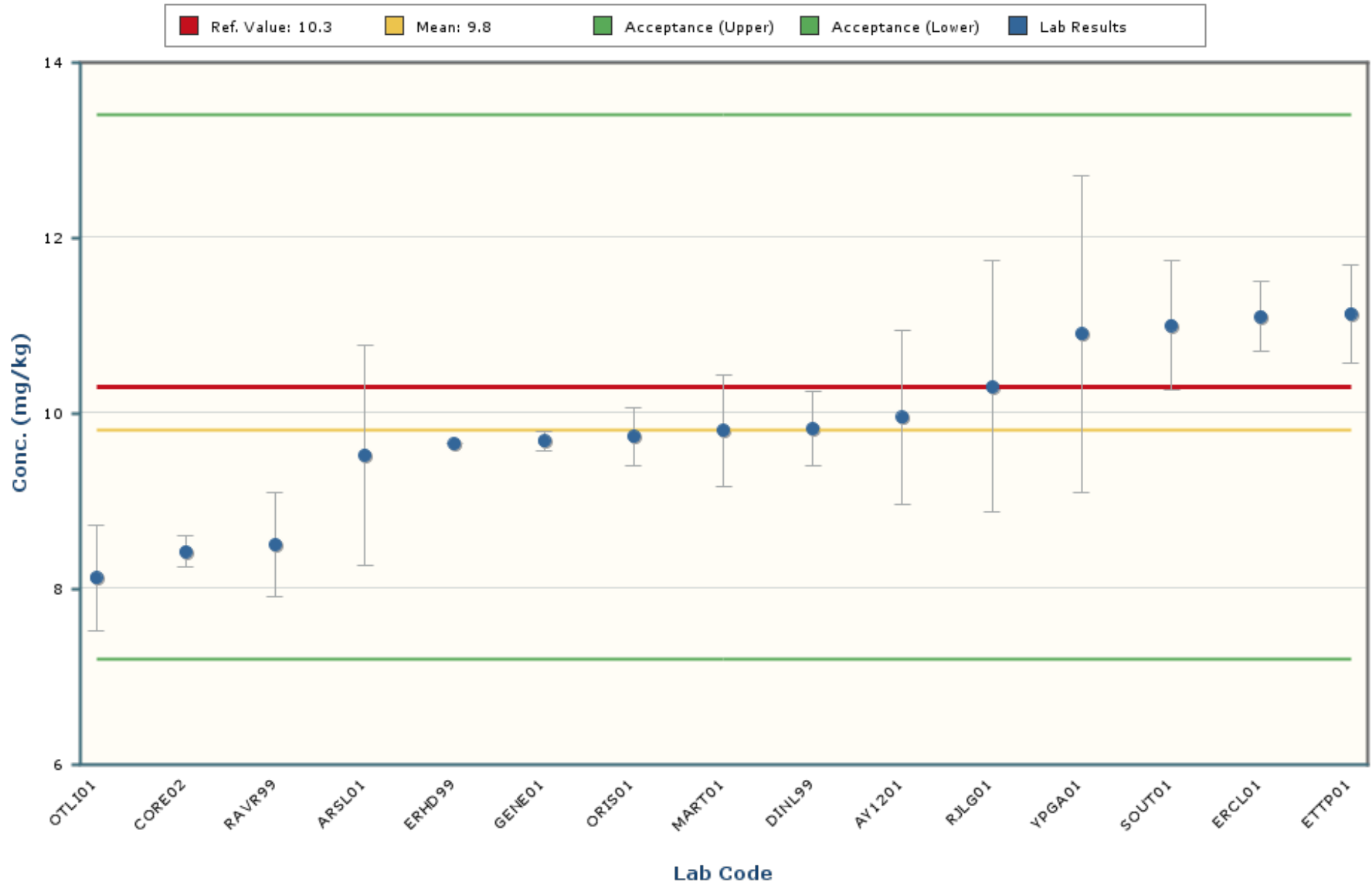
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 4.3 and 15.3 ( $\pm 5$  Standard Deviations).

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

# Uranium-Total

## MAPEP-20-MaS43



### Notes:

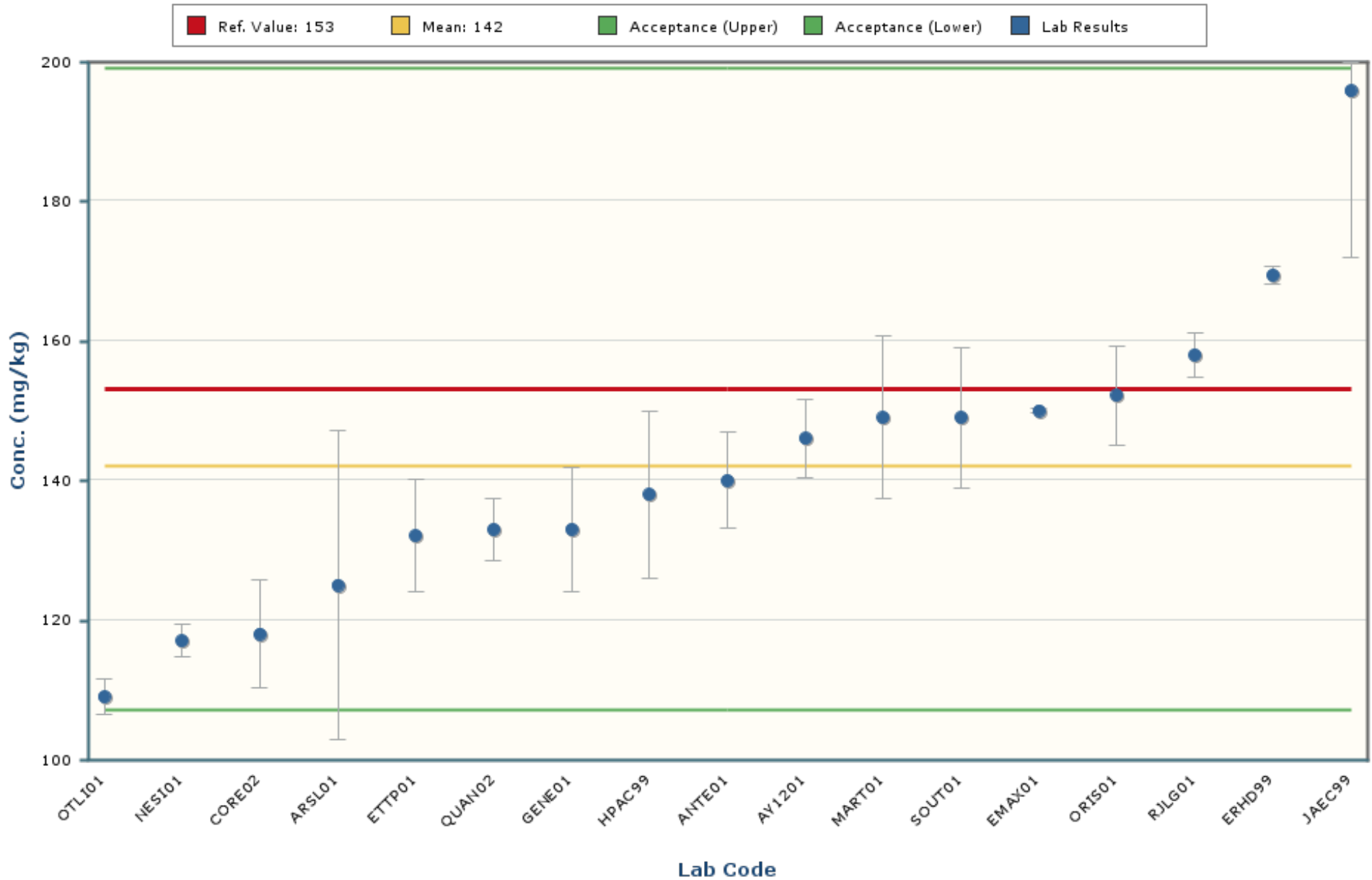
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 5.0 and 14.6 ( $\pm 5$  Standard Deviations).

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

# Vanadium

## MAPEP-20-MaS43



### Notes:

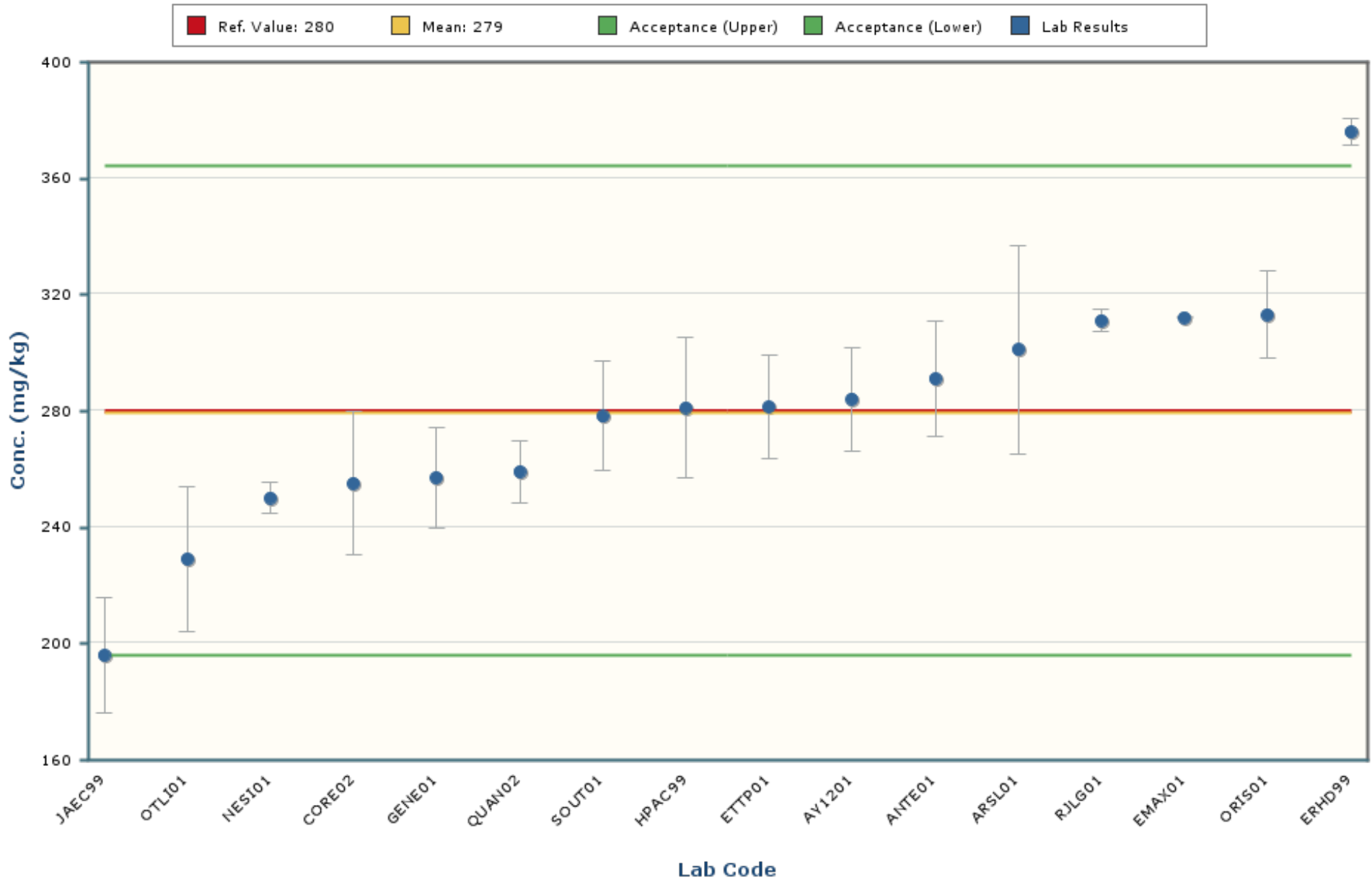
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 37 and 247 ( $\pm 5$  Standard Deviations).

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

# Zinc

## MAPEP-20-MaS43



### Notes:

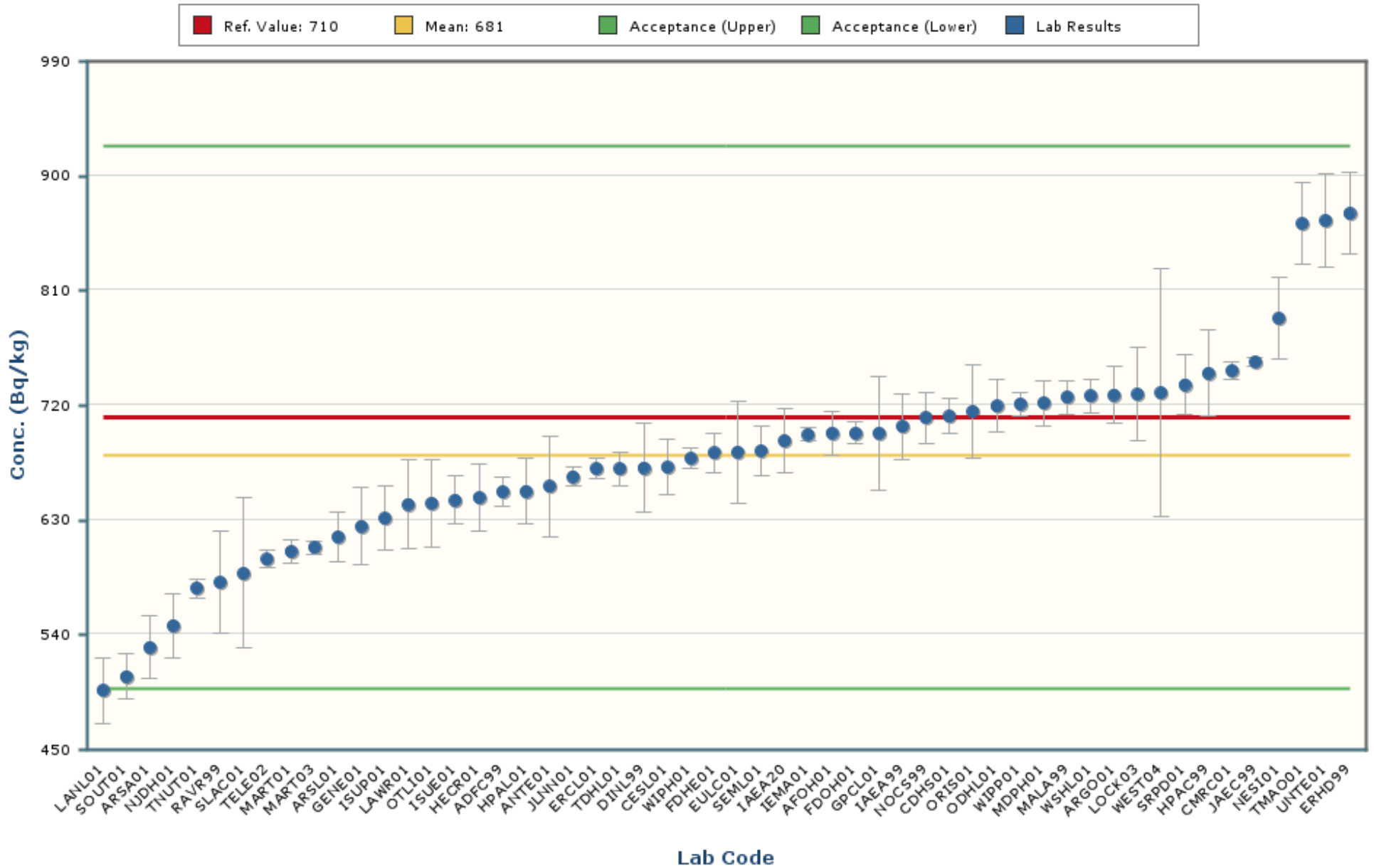
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 149 and 408 ( $\pm 5$  Standard Deviations).

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

# Cesium-134

## MAPEP-20-MaS43



### Notes:

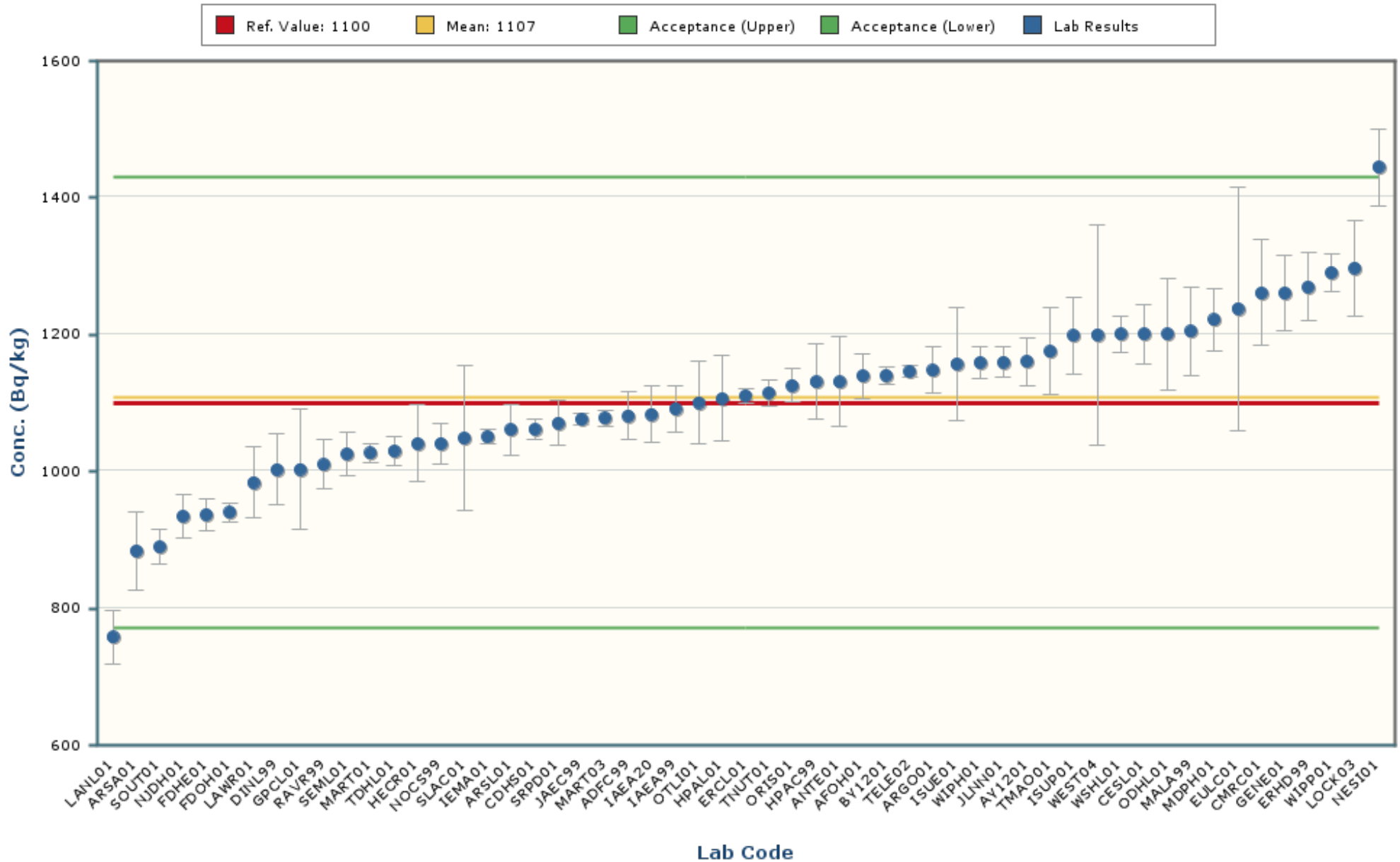
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 310 and 1053 ( $\pm 5$  Standard Deviations).

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

# Cobalt-57

## MAPEP-20-MaS43



### Notes:

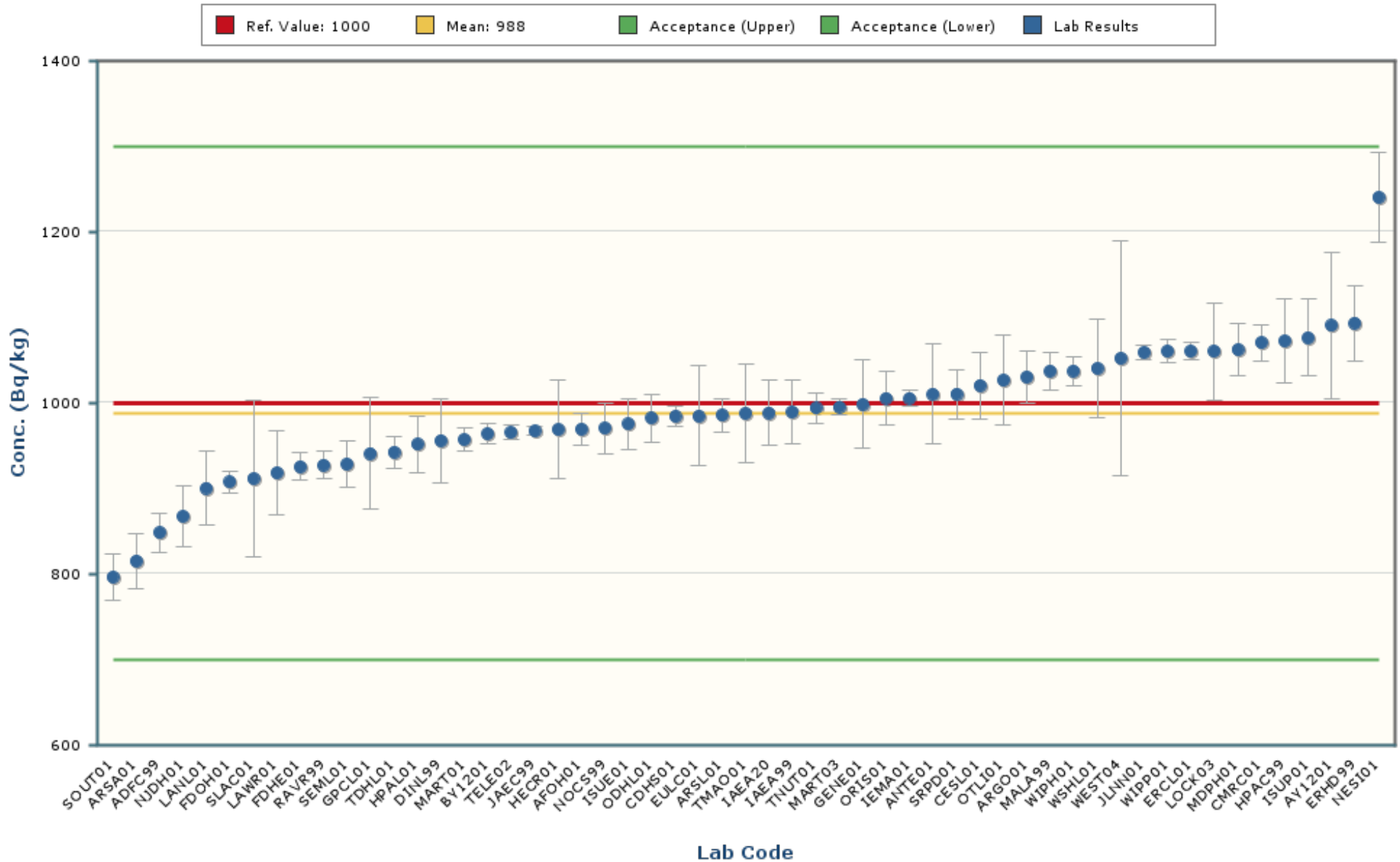
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 606 and 1608 ( $\pm 5$  Standard Deviations).

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

# Cobalt-60

## MAPEP-20-MaS43



### Notes:

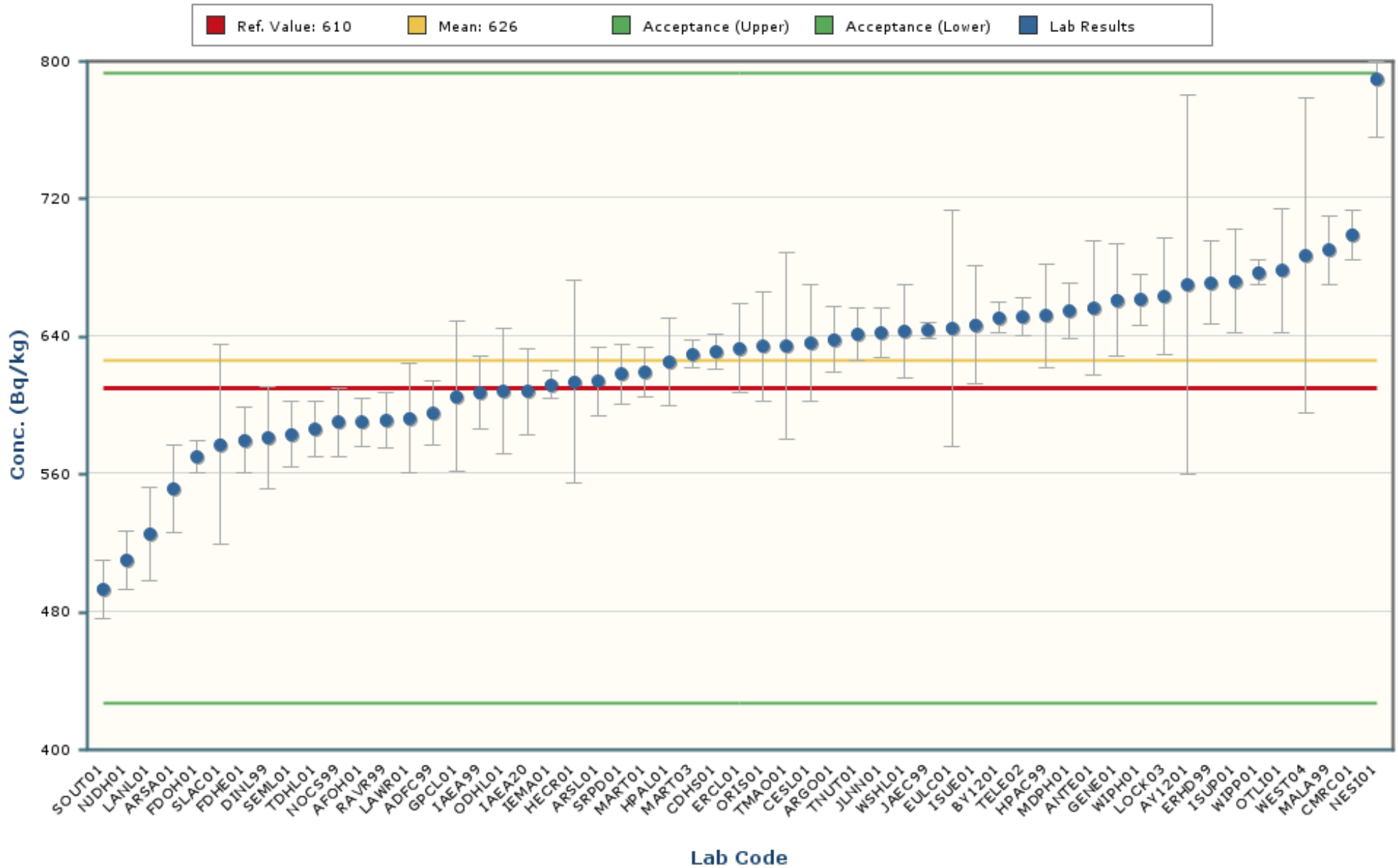
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 617 and 1360 ( $\pm 5$  Standard Deviations).

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

# Manganese-54

## MAPEP-20-MaS43



### Notes:

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

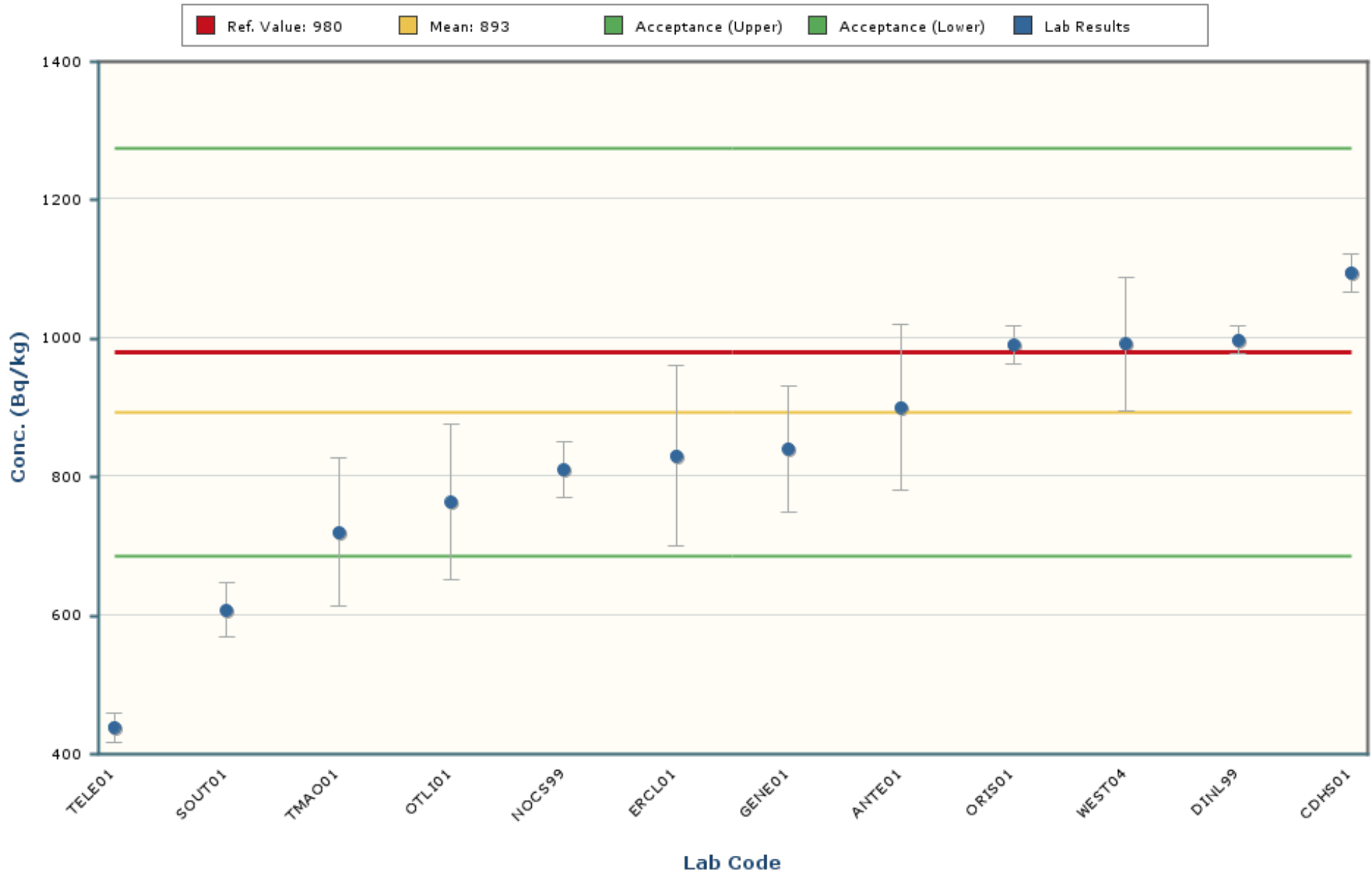
The chart shows only data points with values between 382 and 870 ( $\pm 5$  Standard Deviations).

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



# Nickel-63

## MAPEP-20-MaS43



### Notes:

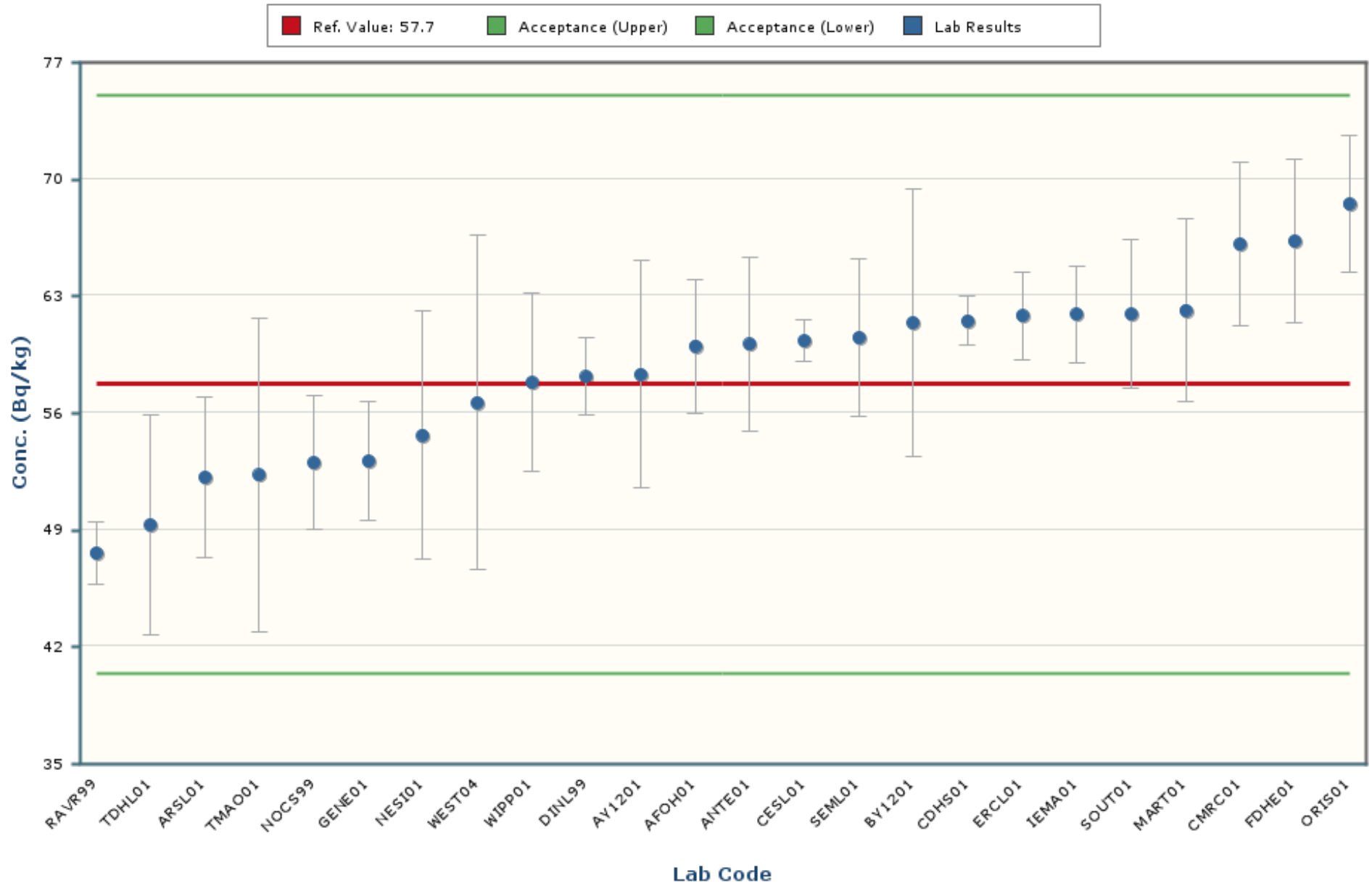
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 290 and 1497 ( $\pm 5$  Standard Deviations).

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

# Plutonium-238

## MAPEP-20-MaS43

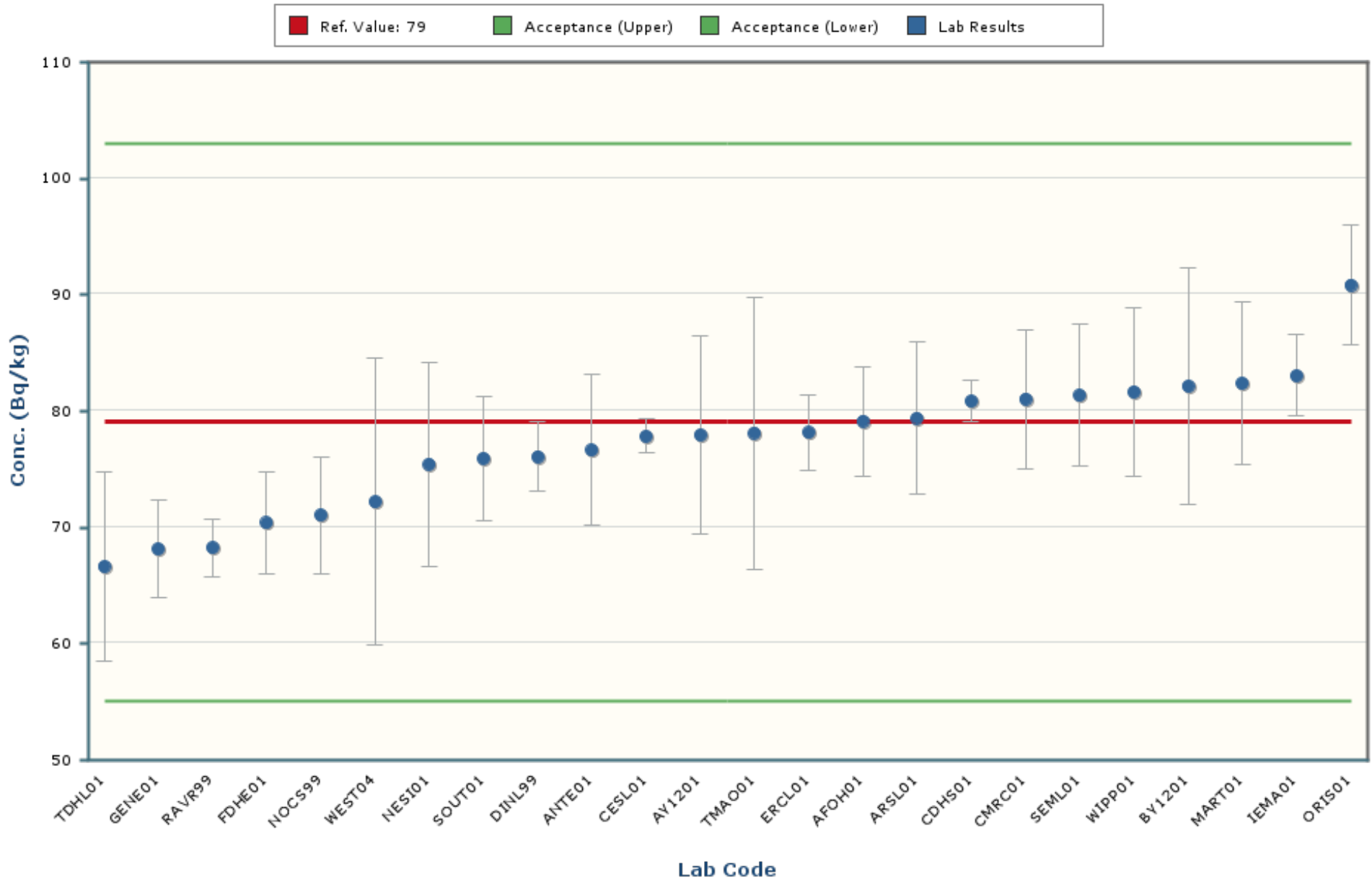


Notes:

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

# Plutonium-239/240

## MAPEP-20-MaS43

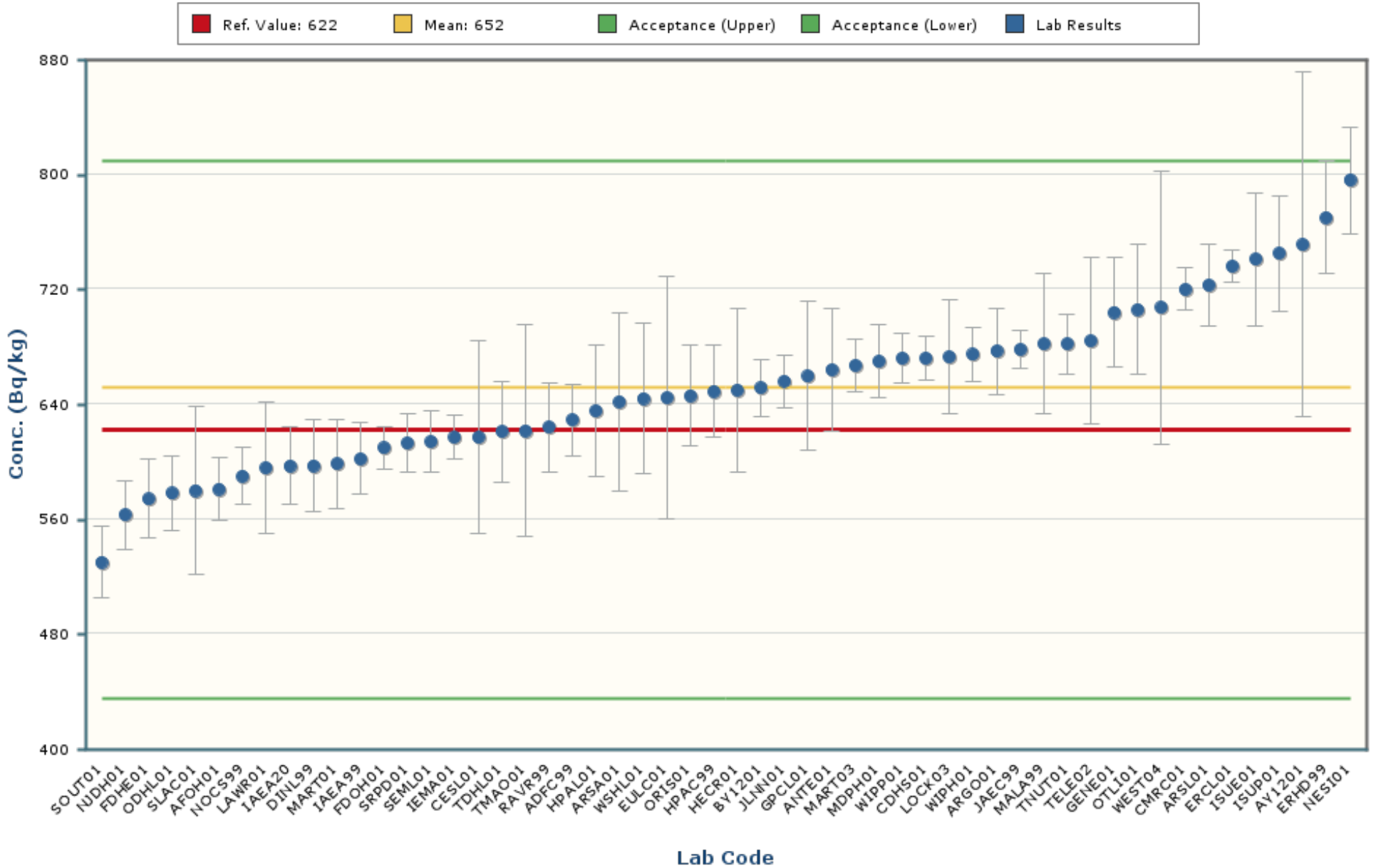


Notes:

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

# Potassium-40

## MAPEP-20-MaS43



### Notes:

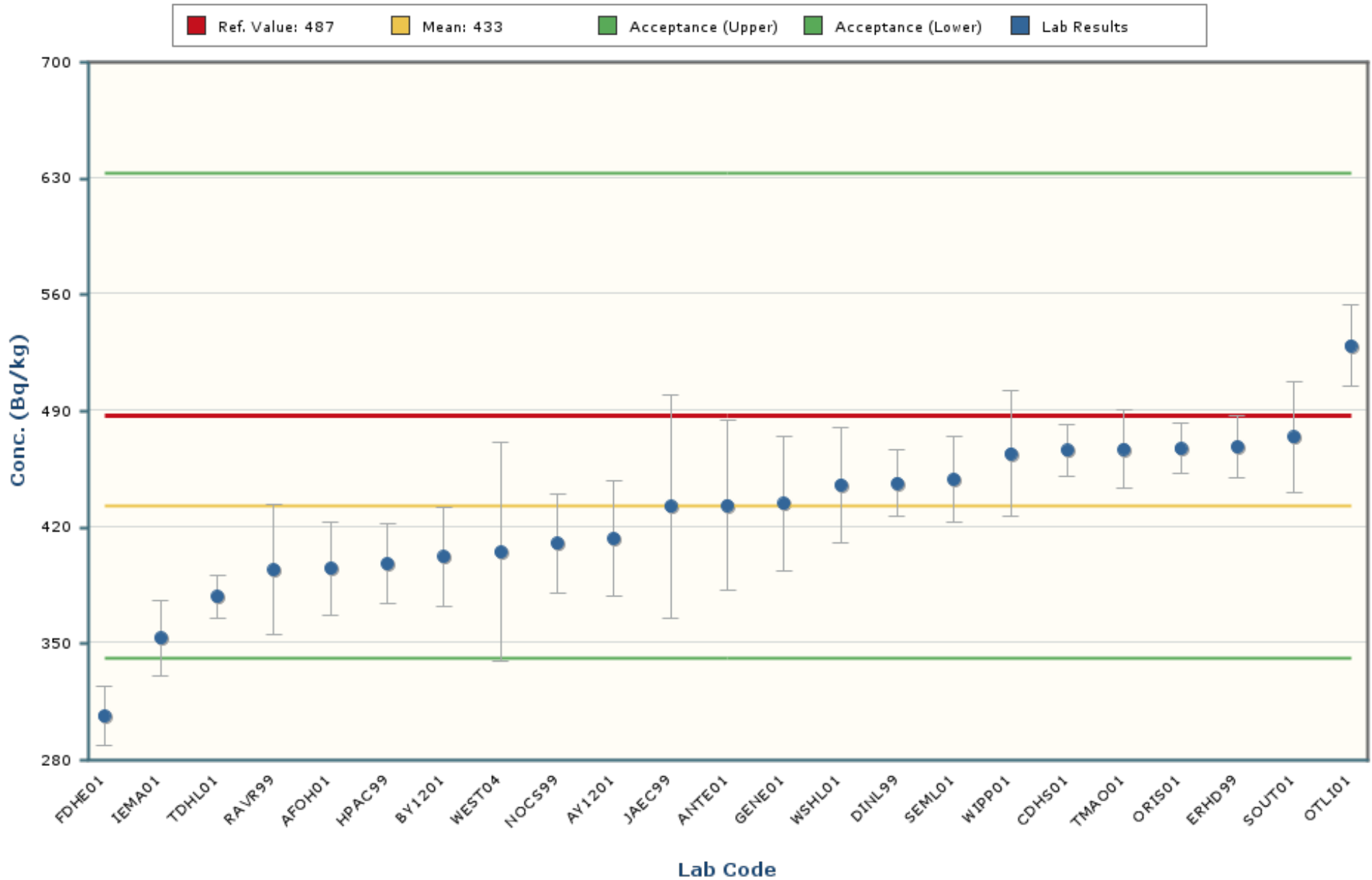
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 372 and 933 ( $\pm 5$  Standard Deviations).

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

# Strontium-90

## MAPEP-20-MaS43



### Notes:

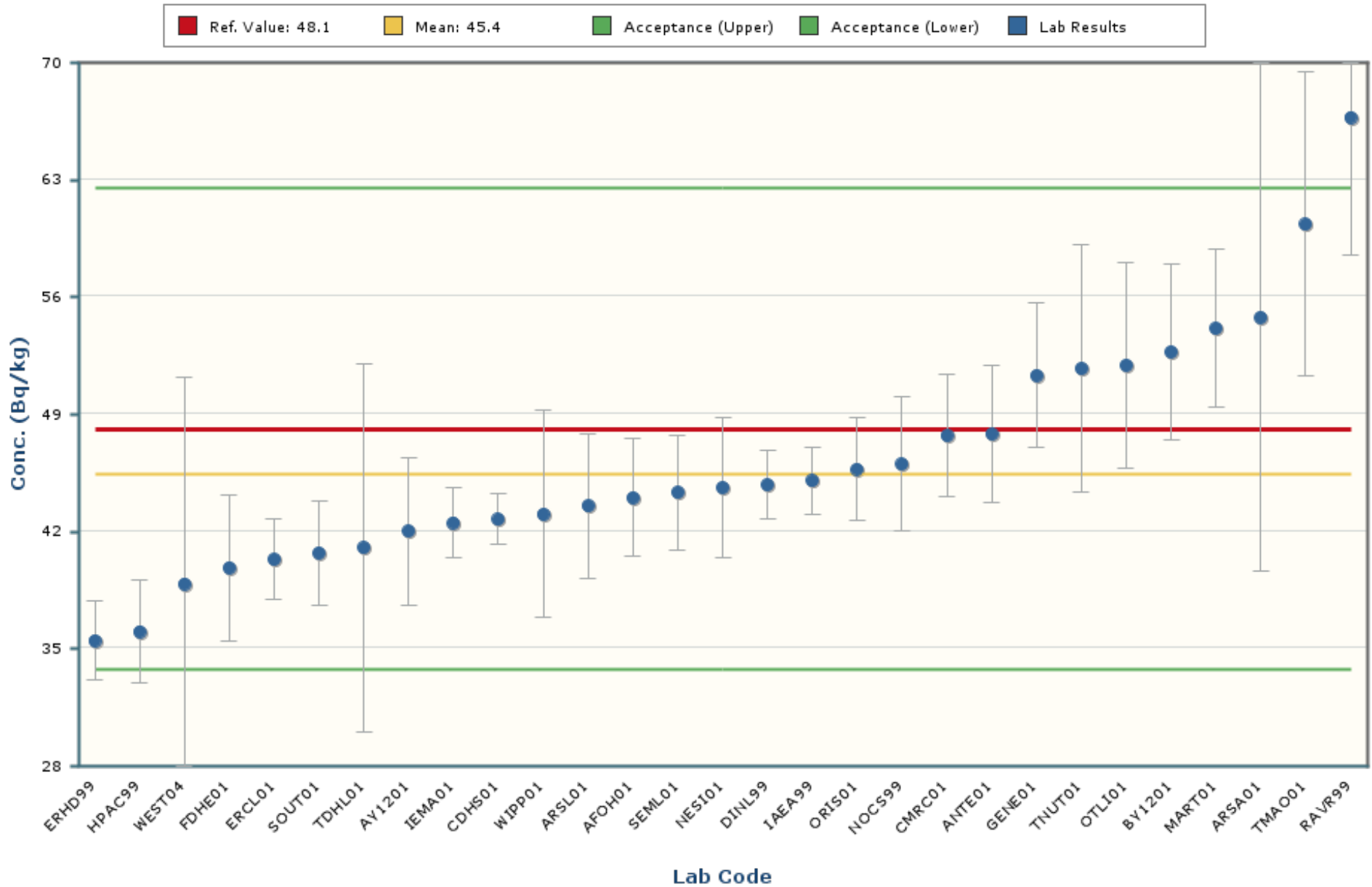
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 234 and 632 ( $\pm 5$  Standard Deviations).

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

# Uranium-234

## MAPEP-20-MaS43



### Notes:

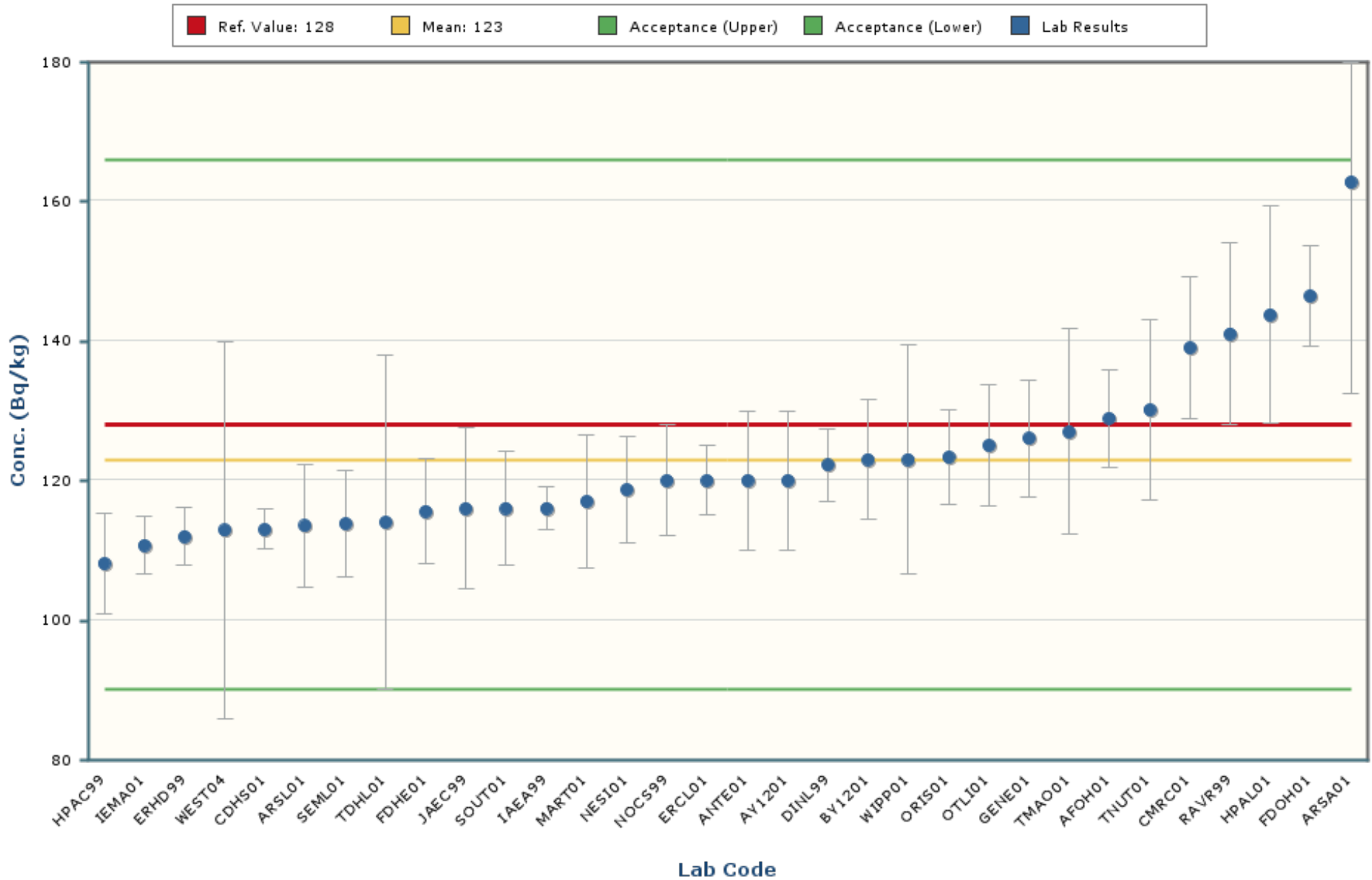
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 16.0 and 74.9 ( $\pm 5$  Standard Deviations).

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

# Uranium-238

## MAPEP-20-MaS43



### Notes:

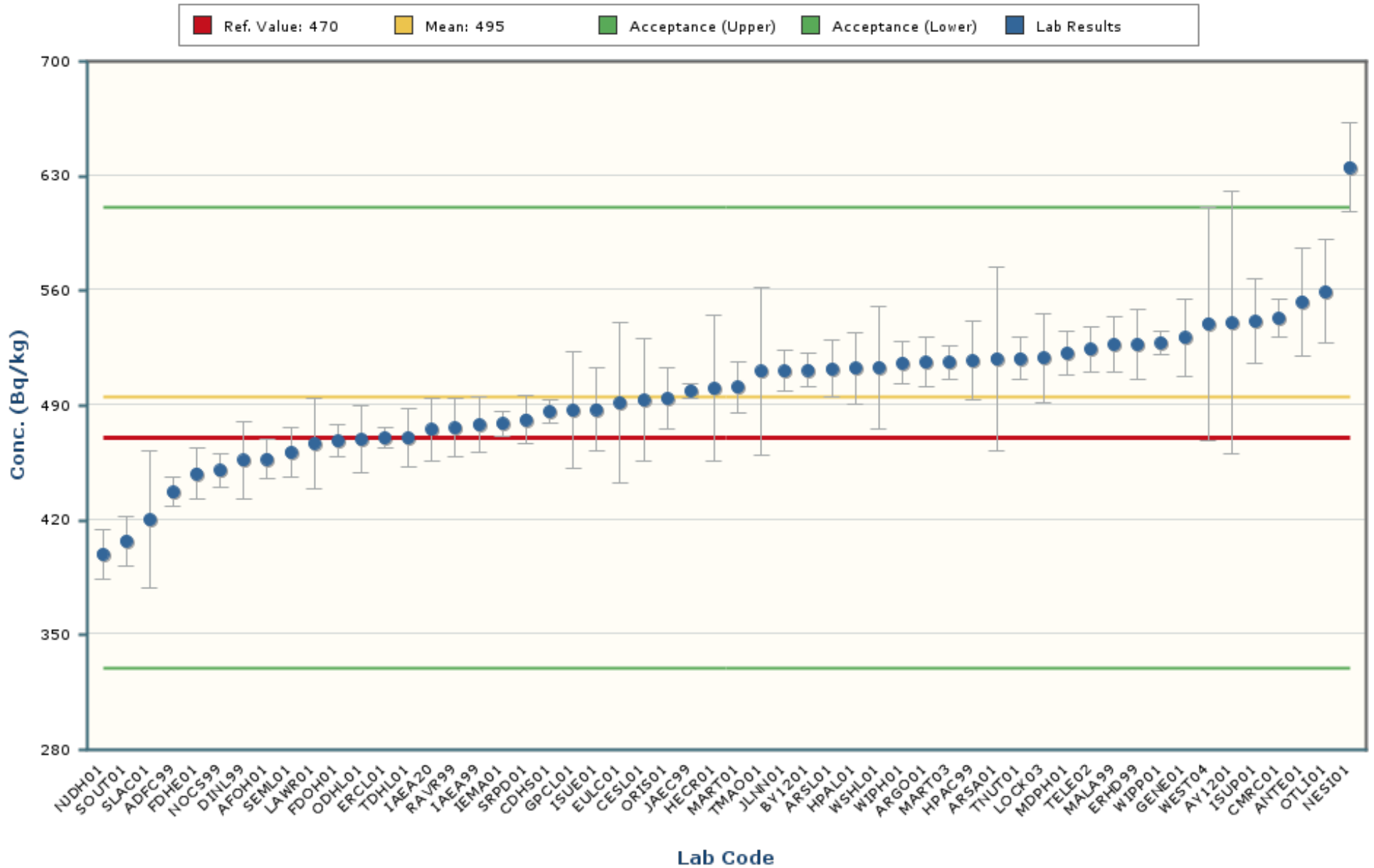
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 63 and 183 ( $\pm 5$  Standard Deviations).

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

# Zinc-65

## MAPEP-20-MaS43



### Notes:

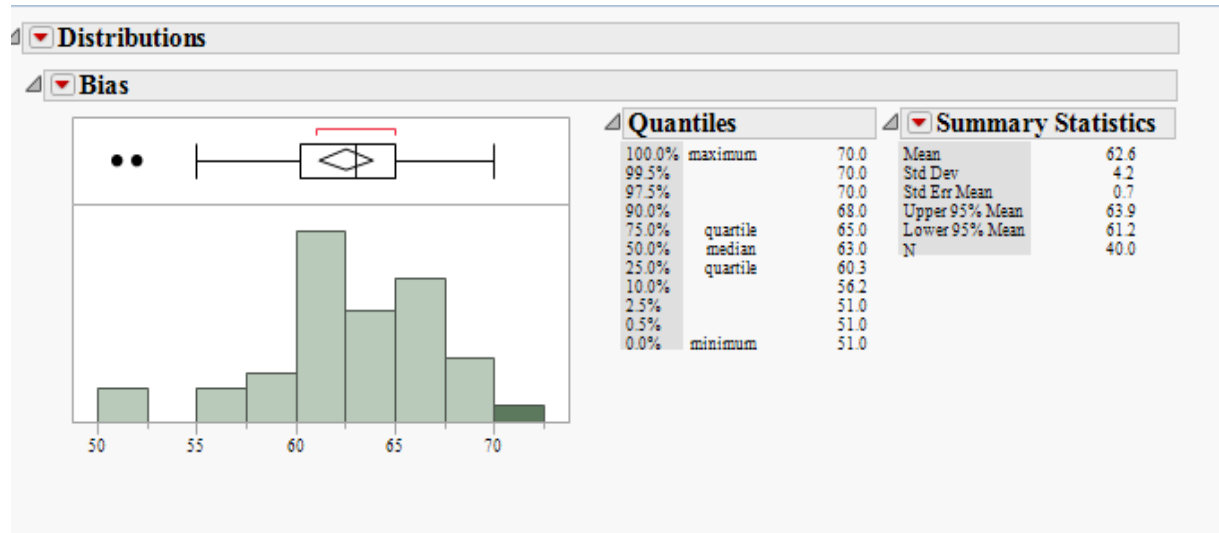
The chart mean excludes values outside of a bias range of  $\pm 30\%$ .

The chart shows only data points with values between 316 and 674 ( $\pm 5$  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.

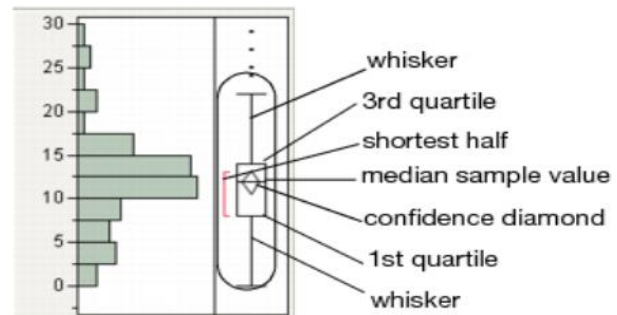


### Outlier Box Plot

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)

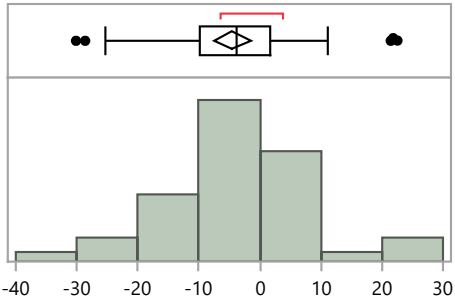


If the data points do not reach the computed ranges, then the whiskers are determined by the upper and lower data point values (not including outliers). The bracket outside of the box identifies the *shortest half*, which is the most dense 50% of the observations (Rousseuw and Leroy 1987).

**MaS Distribution by Detection Method**

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

**Bias**



**Quantiles**

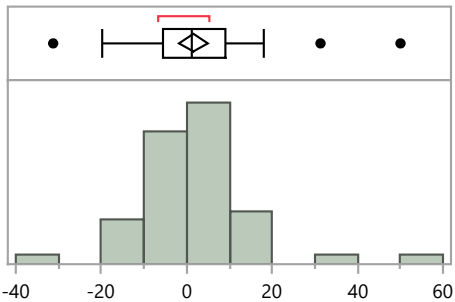
100.0%	maximum	22.5
99.5%		22.5
97.5%		22.2
90.0%		5.7
75.0%	quartile	1.8
50.0%	median	-3.9
25.0%	quartile	-9.9
10.0%		-18.5
2.5%		-29.5
0.5%		-30.1
0.0%	minimum	-30.1

**Summary Statistics**

Mean	-4.5
Std Dev	11.0
Std Err Mean	1.5
Upper 95% Mean	-1.5
Lower 95% Mean	-7.5
N	54.0

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

**Bias**



**Quantiles**

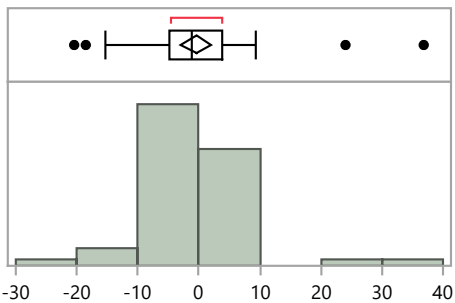
100.0%	maximum	50.0
99.5%		50.0
97.5%		42.1
90.0%		14.8
75.0%	quartile	9.0
50.0%	median	1.1
25.0%	quartile	-5.5
10.0%		-14.7
2.5%		-26.3
0.5%		-31.2
0.0%	minimum	-31.2

**Summary Statistics**

Mean	1.5
Std Dev	12.6
Std Err Mean	1.7
Upper 95% Mean	4.8
Lower 95% Mean	-1.9
N	56.0

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

**Bias**



**Quantiles**

100.0%	maximum	36.8
99.5%		36.8
97.5%		31.4
90.0%		7.3
75.0%	quartile	3.9
50.0%	median	-1.3
25.0%	quartile	-4.8
10.0%		-9.5
2.5%		-19.6
0.5%		-20.4
0.0%	minimum	-20.4

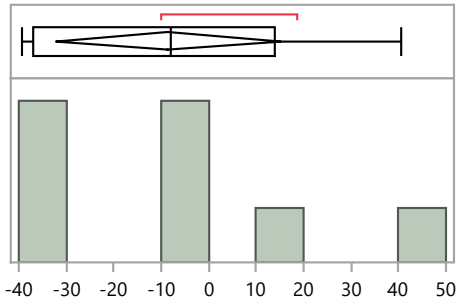
**Summary Statistics**

Mean	-0.5
Std Dev	8.9
Std Err Mean	1.2
Upper 95% Mean	1.9
Lower 95% Mean	-2.9
N	56.0

**MaS Distribution by Detection Method**

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

**Bias**



**Quantiles**

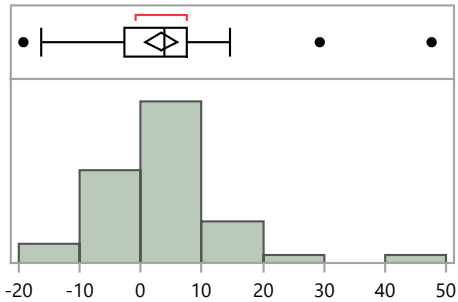
100.0%	maximum	40.6
99.5%		40.6
97.5%		40.6
90.0%		40.6
75.0%	quartile	14.0
50.0%	median	-8.1
25.0%	quartile	-37.0
10.0%		-39.3
2.5%		-39.3
0.5%		-39.3
0.0%	minimum	-39.3

**Summary Statistics**

Mean	-8.5
Std Dev	28.5
Std Err Mean	10.1
Upper 95% Mean	15.3
Lower 95% Mean	-32.3
N	8.0

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

**Bias**



**Quantiles**

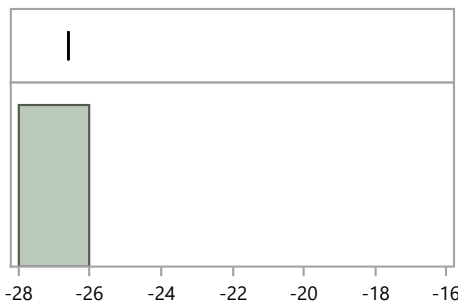
100.0%	maximum	47.6
99.5%		47.6
97.5%		39.8
90.0%		11.6
75.0%	quartile	7.5
50.0%	median	3.9
25.0%	quartile	-2.8
10.0%		-5.8
2.5%		-18.0
0.5%		-19.2
0.0%	minimum	-19.2

**Summary Statistics**

Mean	3.4
Std Dev	10.0
Std Err Mean	1.3
Upper 95% Mean	6.1
Lower 95% Mean	0.7
N	56.0

**Distributions Analyte\_Detection=Nickel-63 Gross Alpha/Beta - 2 pi gas flow proportional counter**

**Bias**



**Quantiles**

100.0%	maximum	-26.6
99.5%		-26.6
97.5%		-26.6
90.0%		-26.6
75.0%	quartile	-26.6
50.0%	median	-26.6
25.0%	quartile	-26.6
10.0%		-26.6
2.5%		-26.6
0.5%		-26.6
0.0%	minimum	-26.6

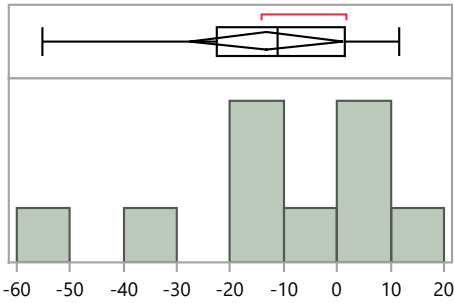
**Summary Statistics**

Mean	-26.6
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

**MaS Distribution by Detection Method**

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

**Bias**



**Quantiles**

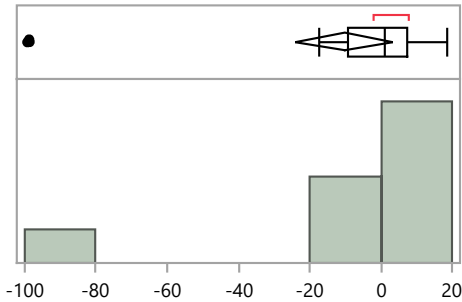
100.0%	maximum	11.6
99.5%		11.6
97.5%		11.6
90.0%		10.6
75.0%	quartile	1.4
50.0%	median	-11.3
25.0%	quartile	-22.5
10.0%		-53.6
2.5%		-55.3
0.5%		-55.3
0.0%	minimum	-55.3

**Summary Statistics**

Mean	-13.3
Std Dev	20.2
Std Err Mean	6.4
Upper 95% Mean	1.2
Lower 95% Mean	-27.8
N	10.0

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

**Bias**



**Quantiles**

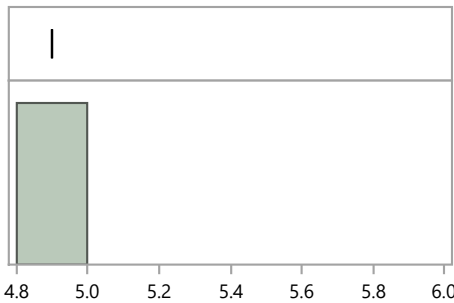
100.0%	maximum	18.7
99.5%		18.7
97.5%		18.7
90.0%		14.7
75.0%	quartile	7.2
50.0%	median	0.9
25.0%	quartile	-9.5
10.0%		-98.6
2.5%		-99.2
0.5%		-99.2
0.0%	minimum	-99.2

**Summary Statistics**

Mean	-10.2
Std Dev	33.8
Std Err Mean	6.6
Upper 95% Mean	3.4
Lower 95% Mean	-23.9
N	26.0

**Distributions Analyte\_Detection=Plutonium-238 Gas Flow Proportional Counter**

**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

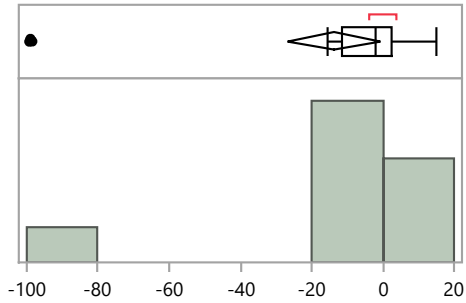
**Summary Statistics**

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

**MaS Distribution by Detection Method**

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

**Bias**



**Quantiles**

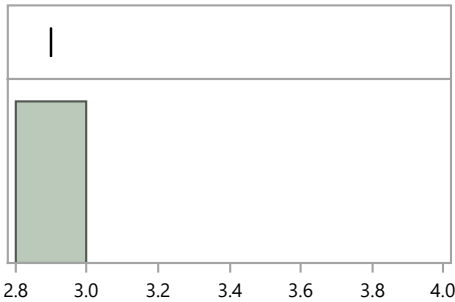
100.0%	maximum	14.9
99.5%		14.9
97.5%		14.9
90.0%		4.5
75.0%	quartile	2.4
50.0%	median	-2.3
25.0%	quartile	-11.7
10.0%		-98.6
2.5%		-99.2
0.5%		-99.2
0.0%	minimum	-99.2

**Summary Statistics**

Mean	-13.6
Std Dev	32.1
Std Err Mean	6.3
Upper 95% Mean	-0.6
Lower 95% Mean	-26.6
N	26.0

**Distributions Analyte\_Detection=Plutonium-239/240 Gas Flow Proportional Counter**

**Bias**



**Quantiles**

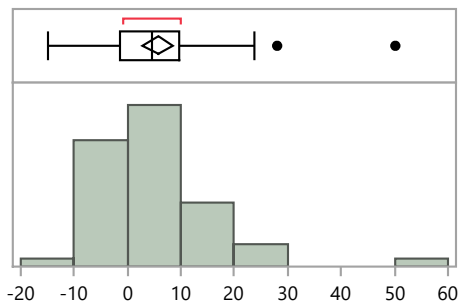
100.0%	maximum	2.9
99.5%		2.9
97.5%		2.9
90.0%		2.9
75.0%	quartile	2.9
50.0%	median	2.9
25.0%	quartile	2.9
10.0%		2.9
2.5%		2.9
0.5%		2.9
0.0%	minimum	2.9

**Summary Statistics**

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

**Distributions Analyte\_Detection=Potassium-40 Gamma Spectrometry**

**Bias**



**Quantiles**

100.0%	maximum	50.1
99.5%		50.1
97.5%		41.3
90.0%		19.4
75.0%	quartile	9.7
50.0%	median	4.5
25.0%	quartile	-1.4
10.0%		-6.7
2.5%		-12.7
0.5%		-14.8
0.0%	minimum	-14.8

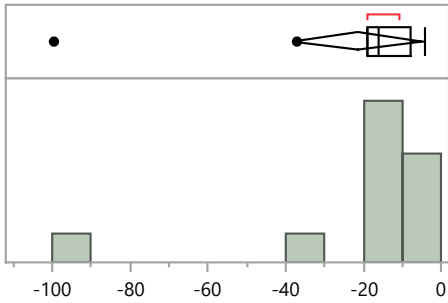
**Summary Statistics**

Mean	5.7
Std Dev	10.8
Std Err Mean	1.5
Upper 95% Mean	8.6
Lower 95% Mean	2.8
N	55.0

**MaS Distribution by Detection Method**

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

Bias



**Quantiles**

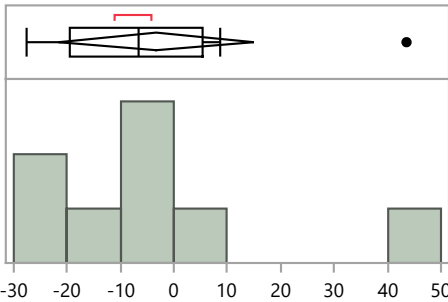
100.0%	maximum	-4.1
99.5%		-4.1
97.5%		-4.1
90.0%		-4.2
75.0%	quartile	-8.0
50.0%	median	-16.1
25.0%	quartile	-18.9
10.0%		-80.9
2.5%		-99.6
0.5%		-99.6
0.0%	minimum	-99.6

**Summary Statistics**

Mean	-21.6
Std Dev	26.1
Std Err Mean	7.5
Upper 95% Mean	-5.0
Lower 95% Mean	-38.2
N	12.0

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

Bias



**Quantiles**

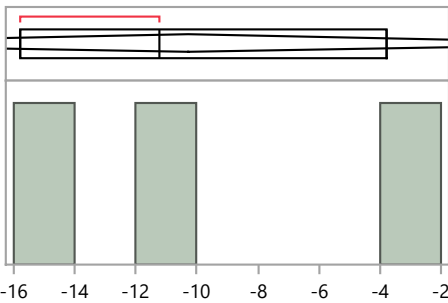
100.0%	maximum	43.5
99.5%		43.5
97.5%		43.5
90.0%		43.5
75.0%	quartile	5.4
50.0%	median	-6.7
25.0%	quartile	-19.6
10.0%		-27.5
2.5%		-27.5
0.5%		-27.5
0.0%	minimum	-27.5

**Summary Statistics**

Mean	-3.3
Std Dev	22.0
Std Err Mean	7.8
Upper 95% Mean	15.1
Lower 95% Mean	-21.6
N	8.0

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

Bias



**Quantiles**

100.0%	maximum	-3.8
99.5%		-3.8
97.5%		-3.8
90.0%		-3.8
75.0%	quartile	-3.8
50.0%	median	-11.2
25.0%	quartile	-15.8
10.0%		-15.8
2.5%		-15.8
0.5%		-15.8
0.0%	minimum	-15.8

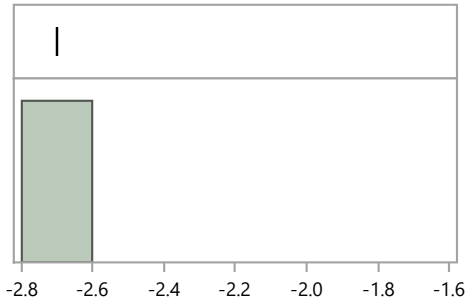
**Summary Statistics**

Mean	-10.3
Std Dev	6.1
Std Err Mean	3.5
Upper 95% Mean	4.8
Lower 95% Mean	-25.3
N	3.0

**MaS Distribution by Detection Method**

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

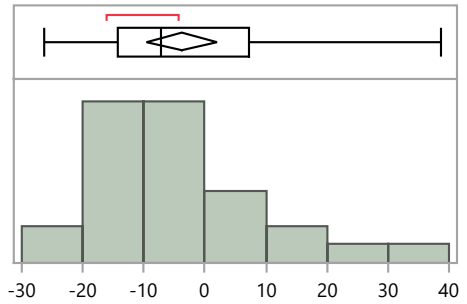
**Bias**



Quantiles			Summary Statistics	
100.0%	maximum	-2.7	Mean	-2.7
99.5%		-2.7	Std Dev	.
97.5%		-2.7	Std Err Mean	.
90.0%		-2.7	Upper 95% Mean	.
75.0%	quartile	-2.7	Lower 95% Mean	.
50.0%	median	-2.7	N	1.0
25.0%	quartile	-2.7		
10.0%		-2.7		
2.5%		-2.7		
0.5%		-2.7		
0.0%	minimum	-2.7		

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

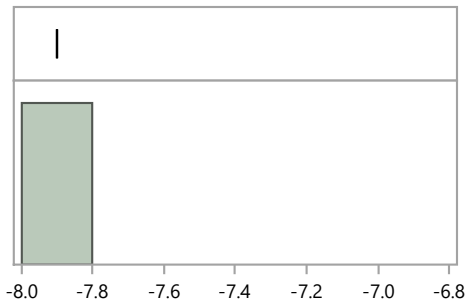
**Bias**



Quantiles			Summary Statistics	
100.0%	maximum	38.7	Mean	-3.8
99.5%		38.7	Std Dev	14.8
97.5%		38.7	Std Err Mean	2.8
90.0%		15.1	Upper 95% Mean	1.9
75.0%	quartile	7.3	Lower 95% Mean	-9.6
50.0%	median	-7.1	N	28.0
25.0%	quartile	-14.3		
10.0%		-19.8		
2.5%		-26.3		
0.5%		-26.3		
0.0%	minimum	-26.3		

**Distributions Analyte\_Detection=Uranium-234 Gas Flow Proportional Counter**

**Bias**

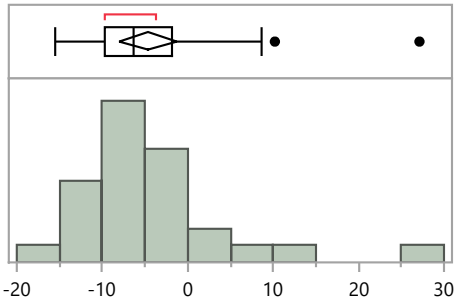


Quantiles			Summary Statistics	
100.0%	maximum	-7.9	Mean	-7.9
99.5%		-7.9	Std Dev	.
97.5%		-7.9	Std Err Mean	.
90.0%		-7.9	Upper 95% Mean	.
75.0%	quartile	-7.9	Lower 95% Mean	.
50.0%	median	-7.9	N	1.0
25.0%	quartile	-7.9		
10.0%		-7.9		
2.5%		-7.9		
0.5%		-7.9		
0.0%	minimum	-7.9		

**MaS Distribution by Detection Method**

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

**Bias**



**Quantiles**

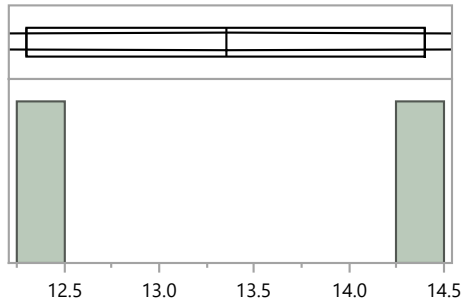
100.0%	maximum	27.1
99.5%		27.1
97.5%		27.1
90.0%		8.8
75.0%	quartile	-1.8
50.0%	median	-6.3
25.0%	quartile	-9.6
10.0%		-12.6
2.5%		-15.5
0.5%		-15.5
0.0%	minimum	-15.5

**Summary Statistics**

Mean	-4.6
Std Dev	8.7
Std Err Mean	1.6
Upper 95% Mean	-1.2
Lower 95% Mean	-7.9
N	28.0

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

**Bias**



**Quantiles**

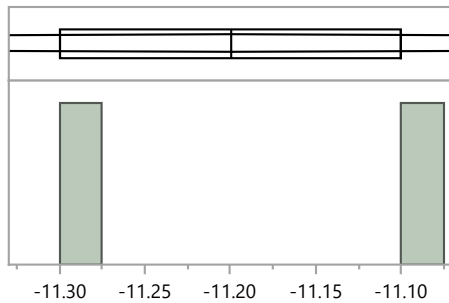
100.0%	maximum	14.4
99.5%		14.4
97.5%		14.4
90.0%		14.4
75.0%	quartile	14.4
50.0%	median	13.4
25.0%	quartile	12.3
10.0%		12.3
2.5%		12.3
0.5%		12.3
0.0%	minimum	12.3

**Summary Statistics**

Mean	13.4
Std Dev	1.5
Std Err Mean	1.1
Upper 95% Mean	26.7
Lower 95% Mean	0.0
N	2.0

**Distributions Analyte\_Detection=Uranium-238 Gas Flow Proportional Counter**

**Bias**



**Quantiles**

100.0%	maximum	-11.1
99.5%		-11.1
97.5%		-11.1
90.0%		-11.1
75.0%	quartile	-11.1
50.0%	median	-11.2
25.0%	quartile	-11.3
10.0%		-11.3
2.5%		-11.3
0.5%		-11.3
0.0%	minimum	-11.3

**Summary Statistics**

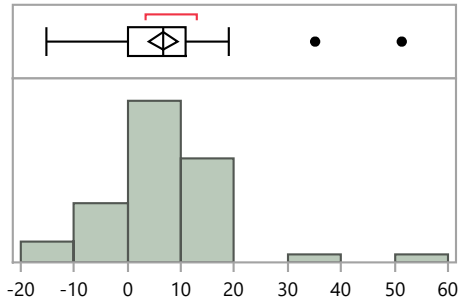
Mean	-11.2
Std Dev	0.1
Std Err Mean	0.1
Upper 95% Mean	-9.9
Lower 95% Mean	-12.5
N	2.0



**MaS Distribution by Detection Method**

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

**Bias**



**Quantiles**

100.0%	maximum	51.3
99.5%		51.3
97.5%		44.8
90.0%		15.3
75.0%	quartile	11.0
50.0%	median	6.6
25.0%	quartile	0.0
10.0%		-4.5
2.5%		-14.4
0.5%		-15.1
0.0%	minimum	-15.1

**Summary Statistics**

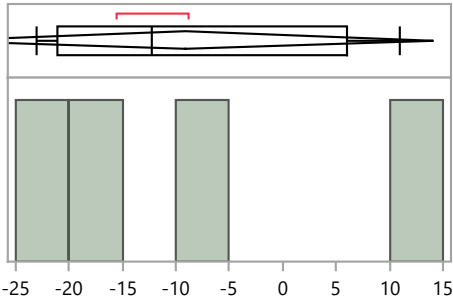
Mean	6.7
Std Dev	10.5
Std Err Mean	1.4
Upper 95% Mean	9.5
Lower 95% Mean	3.8
N	55.0

MaS43 Distribution by Preparation Method

**MaS Distribution by Prep Method**

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

**Bias**



**Quantiles**

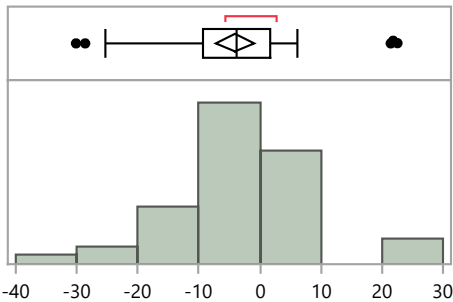
100.0%	maximum	11.0
99.5%		11.0
97.5%		11.0
90.0%		11.0
75.0%	quartile	6.1
50.0%	median	-12.2
25.0%	quartile	-21.2
10.0%		-23.0
2.5%		-23.0
0.5%		-23.0
0.0%	minimum	-23.0

**Summary Statistics**

Mean	-9.1
Std Dev	14.6
Std Err Mean	7.3
Upper 95% Mean	14.1
Lower 95% Mean	-32.3
N	4.0

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

**Bias**



**Quantiles**

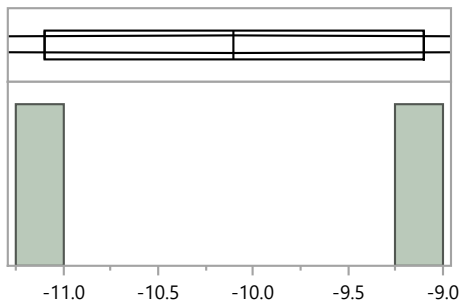
100.0%	maximum	22.5
99.5%		22.5
97.5%		22.4
90.0%		5.2
75.0%	quartile	1.6
50.0%	median	-3.7
25.0%	quartile	-9.4
10.0%		-18.3
2.5%		-29.8
0.5%		-30.1
0.0%	minimum	-30.1

**Summary Statistics**

Mean	-4.1
Std Dev	10.9
Std Err Mean	1.6
Upper 95% Mean	-0.9
Lower 95% Mean	-7.3
N	47.0

**Distributions Analyte\_Method=Cesium-134 Other**

**Bias**



**Quantiles**

100.0%	maximum	-9.1
99.5%		-9.1
97.5%		-9.1
90.0%		-9.1
75.0%	quartile	-9.1
50.0%	median	-10.1
25.0%	quartile	-11.1
10.0%		-11.1
2.5%		-11.1
0.5%		-11.1
0.0%	minimum	-11.1

**Summary Statistics**

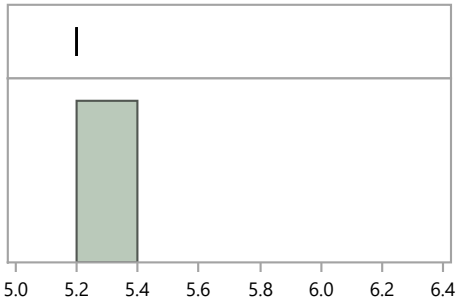
Mean	-10.1
Std Dev	1.4
Std Err Mean	1.0
Upper 95% Mean	2.6
Lower 95% Mean	-22.8
N	2.0

MaS43 Distribution by Preparation Method

**MaS Distribution by Prep Method**

**Distributions Analyte\_Method=Cesium-134 Total dissolution by fusion**

Bias



**Quantiles**

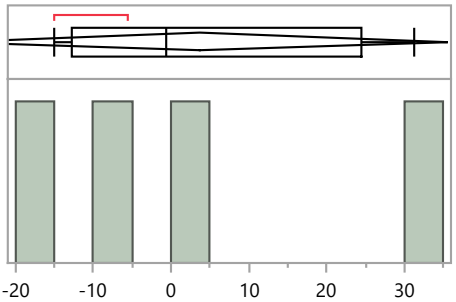
100.0%	maximum	5.2
99.5%		5.2
97.5%		5.2
90.0%		5.2
75.0%	quartile	5.2
50.0%	median	5.2
25.0%	quartile	5.2
10.0%		5.2
2.5%		5.2
0.5%		5.2
0.0%	minimum	5.2

**Summary Statistics**

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

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

Bias



**Quantiles**

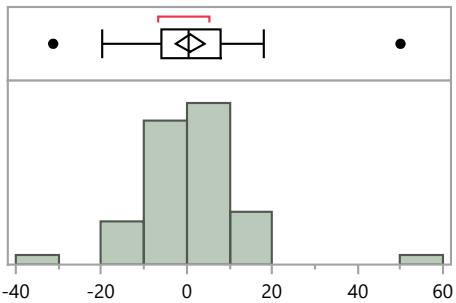
100.0%	maximum	31.3
99.5%		31.3
97.5%		31.3
90.0%		31.3
75.0%	quartile	24.5
50.0%	median	-0.7
25.0%	quartile	-12.7
10.0%		-15.1
2.5%		-15.1
0.5%		-15.1
0.0%	minimum	-15.1

**Summary Statistics**

Mean	3.7
Std Dev	20.0
Std Err Mean	10.0
Upper 95% Mean	35.5
Lower 95% Mean	-28.1
N	4.0

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

Bias



**Quantiles**

100.0%	maximum	50.0
99.5%		50.0
97.5%		42.0
90.0%		14.5
75.0%	quartile	7.9
50.0%	median	0.5
25.0%	quartile	-6.0
10.0%		-14.6
2.5%		-28.3
0.5%		-31.2
0.0%	minimum	-31.2

**Summary Statistics**

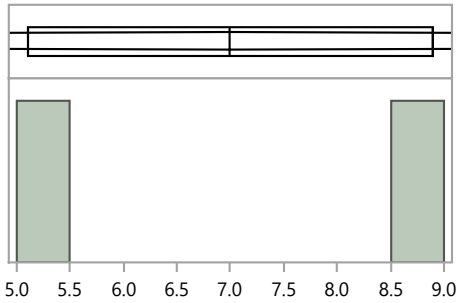
Mean	0.8
Std Dev	12.2
Std Err Mean	1.7
Upper 95% Mean	4.3
Lower 95% Mean	-2.7
N	49.0

MaS43 Distribution by Preparation Method

**MaS Distribution by Prep Method**

**Distributions Analyte\_Method=Cobalt-57 Other**

**Bias**



**Quantiles**

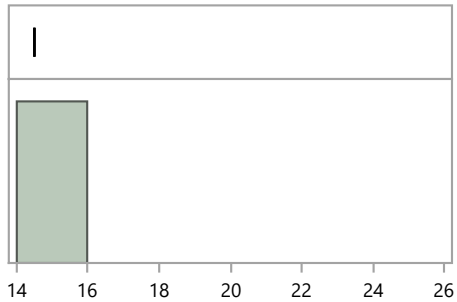
100.0%	maximum	8.9
99.5%		8.9
97.5%		8.9
90.0%		8.9
75.0%	quartile	8.9
50.0%	median	7.0
25.0%	quartile	5.1
10.0%		5.1
2.5%		5.1
0.5%		5.1
0.0%	minimum	5.1

**Summary Statistics**

Mean	7.0
Std Dev	2.7
Std Err Mean	1.9
Upper 95% Mean	31.1
Lower 95% Mean	-17.1
N	2.0

**Distributions Analyte\_Method=Cobalt-57 Total dissolution by fusion**

**Bias**



**Quantiles**

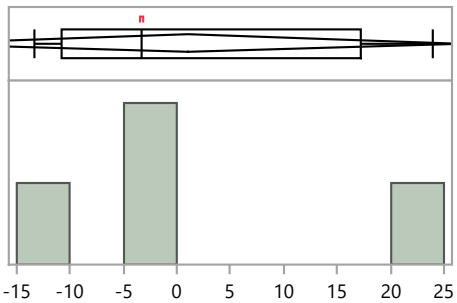
100.0%	maximum	14.5
99.5%		14.5
97.5%		14.5
90.0%		14.5
75.0%	quartile	14.5
50.0%	median	14.5
25.0%	quartile	14.5
10.0%		14.5
2.5%		14.5
0.5%		14.5
0.0%	minimum	14.5

**Summary Statistics**

Mean	14.5
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	24.0
99.5%		24.0
97.5%		24.0
90.0%		24.0
75.0%	quartile	17.2
50.0%	median	-3.4
25.0%	quartile	-10.9
10.0%		-13.3
2.5%		-13.3
0.5%		-13.3
0.0%	minimum	-13.3

**Summary Statistics**

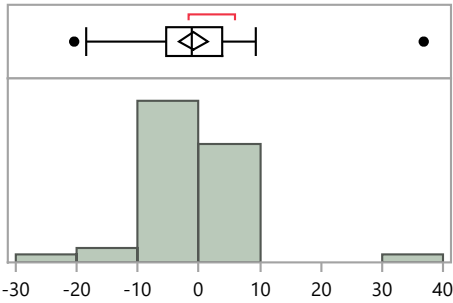
Mean	1.0
Std Dev	16.0
Std Err Mean	8.0
Upper 95% Mean	26.5
Lower 95% Mean	-24.5
N	4.0

MaS43 Distribution by Preparation Method

**MaS Distribution by Prep Method**

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

**Bias**



**Quantiles**

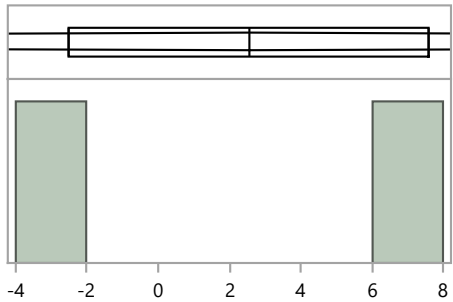
100.0%	maximum	36.8
99.5%		36.8
97.5%		29.9
90.0%		6.2
75.0%	quartile	3.7
50.0%	median	-1.2
25.0%	quartile	-5.4
10.0%		-9.3
2.5%		-19.9
0.5%		-20.4
0.0%	minimum	-20.4

**Summary Statistics**

Mean	-0.9
Std Dev	8.5
Std Err Mean	1.2
Upper 95% Mean	1.6
Lower 95% Mean	-3.3
N	49.0

**Distributions Analyte\_Method=Cobalt-60 Other**

**Bias**



**Quantiles**

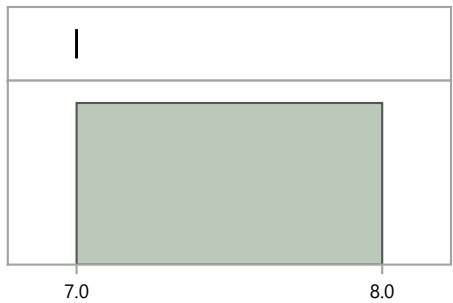
100.0%	maximum	7.6
99.5%		7.6
97.5%		7.6
90.0%		7.6
75.0%	quartile	7.6
50.0%	median	2.6
25.0%	quartile	-2.5
10.0%		-2.5
2.5%		-2.5
0.5%		-2.5
0.0%	minimum	-2.5

**Summary Statistics**

Mean	2.6
Std Dev	7.1
Std Err Mean	5.1
Upper 95% Mean	66.7
Lower 95% Mean	-61.6
N	2.0

**Distributions Analyte\_Method=Cobalt-60 Total dissolution by fusion**

**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	7.0
25.0%	quartile	7.0
10.0%		7.0
2.5%		7.0
0.5%		7.0
0.0%	minimum	7.0

**Summary Statistics**

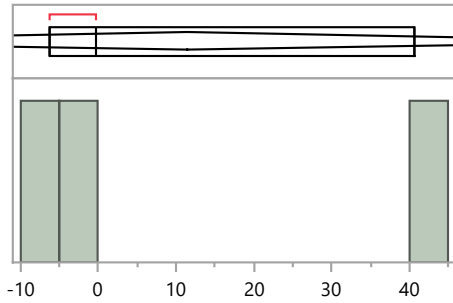
Mean	7.0
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

MaS43 Distribution by Preparation Method

**MaS Distribution by Prep Method**

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

**Bias**



**Quantiles**

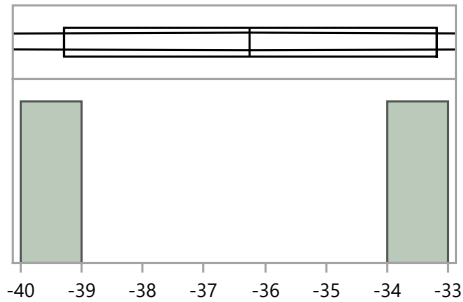
100.0%	maximum	40.6
99.5%		40.6
97.5%		40.6
90.0%		40.6
75.0%	quartile	40.6
50.0%	median	-0.3
25.0%	quartile	-6.2
10.0%		-6.2
2.5%		-6.2
0.5%		-6.2
0.0%	minimum	-6.2

**Summary Statistics**

Mean	11.4
Std Dev	25.5
Std Err Mean	14.7
Upper 95% Mean	74.7
Lower 95% Mean	-51.9
N	3.0

**Distributions Analyte\_Method=Iron-55 Acid leaching without hydrofluoric acid**

**Bias**



**Quantiles**

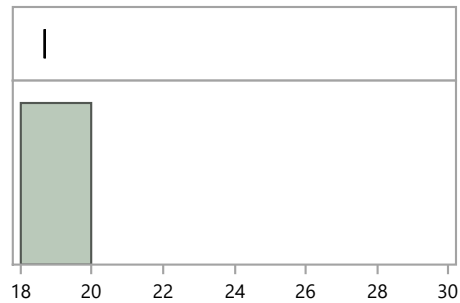
100.0%	maximum	-33.2
99.5%		-33.2
97.5%		-33.2
90.0%		-33.2
75.0%	quartile	-33.2
50.0%	median	-36.3
25.0%	quartile	-39.3
10.0%		-39.3
2.5%		-39.3
0.5%		-39.3
0.0%	minimum	-39.3

**Summary Statistics**

Mean	-36.3
Std Dev	4.3
Std Err Mean	3.0
Upper 95% Mean	2.5
Lower 95% Mean	-75.0
N	2.0

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

**Bias**



**Quantiles**

100.0%	maximum	18.7
99.5%		18.7
97.5%		18.7
90.0%		18.7
75.0%	quartile	18.7
50.0%	median	18.7
25.0%	quartile	18.7
10.0%		18.7
2.5%		18.7
0.5%		18.7
0.0%	minimum	18.7

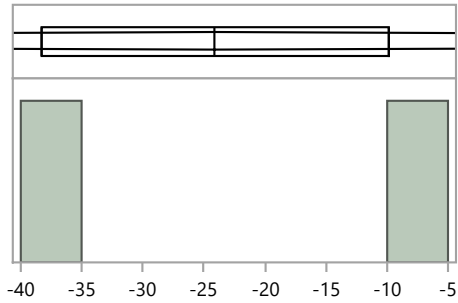
**Summary Statistics**

Mean	18.7
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

**MaS Distribution by Prep Method**

**Distributions Analyte\_Method=Iron-55 Total dissolution by fusion**

**Bias**



**Quantiles**

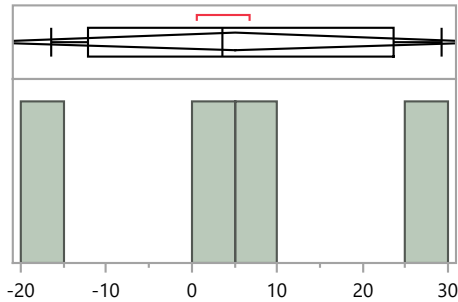
100.0%	maximum	-9.9
99.5%		-9.9
97.5%		-9.9
90.0%		-9.9
75.0%	quartile	-9.9
50.0%	median	-24.1
25.0%	quartile	-38.3
10.0%		-38.3
2.5%		-38.3
0.5%		-38.3
0.0%	minimum	-38.3

**Summary Statistics**

Mean	-24.1
Std Dev	20.1
Std Err Mean	14.2
Upper 95% Mean	156.3
Lower 95% Mean	-204.5
N	2.0

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

**Bias**



**Quantiles**

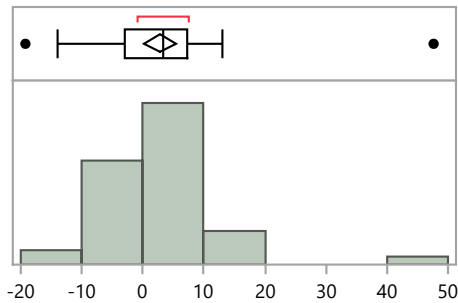
100.0%	maximum	29.3
99.5%		29.3
97.5%		29.3
90.0%		29.3
75.0%	quartile	23.7
50.0%	median	3.7
25.0%	quartile	-12.2
10.0%		-16.4
2.5%		-16.4
0.5%		-16.4
0.0%	minimum	-16.4

**Summary Statistics**

Mean	5.1
Std Dev	18.9
Std Err Mean	9.4
Upper 95% Mean	35.1
Lower 95% Mean	-25.0
N	4.0

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

**Bias**



**Quantiles**

100.0%	maximum	47.6
99.5%		47.6
97.5%		39.0
90.0%		11.0
75.0%	quartile	7.2
50.0%	median	3.4
25.0%	quartile	-3.0
10.0%		-5.4
2.5%		-17.9
0.5%		-19.2
0.0%	minimum	-19.2

**Summary Statistics**

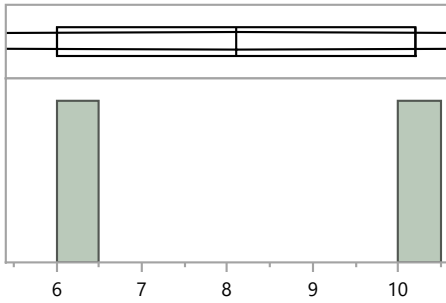
Mean	2.8
Std Dev	9.3
Std Err Mean	1.3
Upper 95% Mean	5.5
Lower 95% Mean	0.2
N	49.0

MaS43 Distribution by Preparation Method

**MaS Distribution by Prep Method**

**Distributions Analyte\_Method=Manganese-54 Other**

**Bias**



**Quantiles**

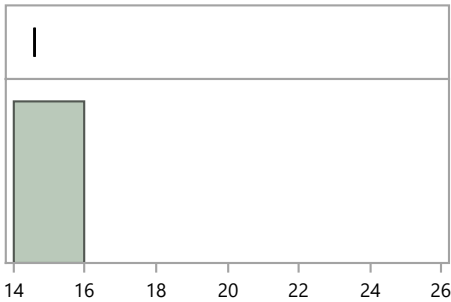
100.0%	maximum	10.2
99.5%		10.2
97.5%		10.2
90.0%		10.2
75.0%	quartile	10.2
50.0%	median	8.1
25.0%	quartile	6.0
10.0%		6.0
2.5%		6.0
0.5%		6.0
0.0%	minimum	6.0

**Summary Statistics**

Mean	8.1
Std Dev	3.0
Std Err Mean	2.1
Upper 95% Mean	34.8
Lower 95% Mean	-18.6
N	2.0

**Distributions Analyte\_Method=Manganese-54 Total dissolution by fusion**

**Bias**



**Quantiles**

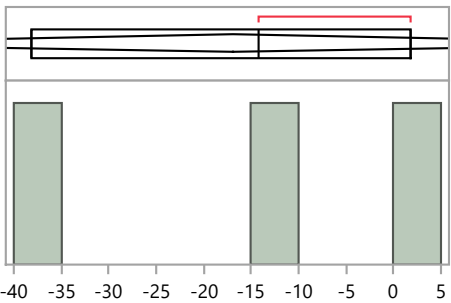
100.0%	maximum	14.6
99.5%		14.6
97.5%		14.6
90.0%		14.6
75.0%	quartile	14.6
50.0%	median	14.6
25.0%	quartile	14.6
10.0%		14.6
2.5%		14.6
0.5%		14.6
0.0%	minimum	14.6

**Summary Statistics**

Mean	14.6
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

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

**Bias**



**Quantiles**

100.0%	maximum	1.8
99.5%		1.8
97.5%		1.8
90.0%		1.8
75.0%	quartile	1.8
50.0%	median	-14.3
25.0%	quartile	-38.1
10.0%		-38.1
2.5%		-38.1
0.5%		-38.1
0.0%	minimum	-38.1

**Summary Statistics**

Mean	-16.9
Std Dev	20.1
Std Err Mean	11.6
Upper 95% Mean	33.0
Lower 95% Mean	-66.7
N	3.0

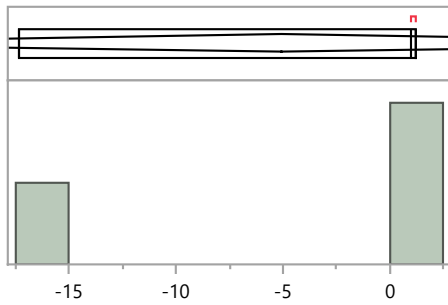


MaS43 Distribution by Preparation Method

**MaS Distribution by Prep Method**

**Distributions Analyte\_Method=Nickel-63 Acid leaching without hydrofluoric acid**

**Bias**



**Quantiles**

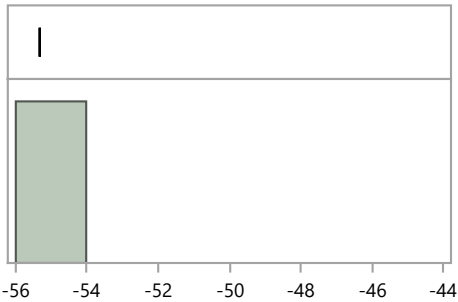
100.0%	maximum	1.2
99.5%		1.2
97.5%		1.2
90.0%		1.2
75.0%	quartile	1.2
50.0%	median	1.0
25.0%	quartile	-17.3
10.0%		-17.3
2.5%		-17.3
0.5%		-17.3
0.0%	minimum	-17.3

**Summary Statistics**

Mean	-5.0
Std Dev	10.6
Std Err Mean	6.1
Upper 95% Mean	21.4
Lower 95% Mean	-31.4
N	3.0

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

**Bias**



**Quantiles**

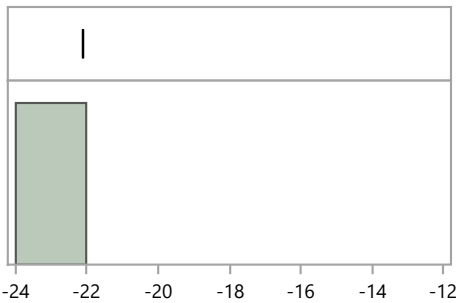
100.0%	maximum	-55.3
99.5%		-55.3
97.5%		-55.3
90.0%		-55.3
75.0%	quartile	-55.3
50.0%	median	-55.3
25.0%	quartile	-55.3
10.0%		-55.3
2.5%		-55.3
0.5%		-55.3
0.0%	minimum	-55.3

**Summary Statistics**

Mean	-55.3
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

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

**Bias**



**Quantiles**

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

**Summary Statistics**

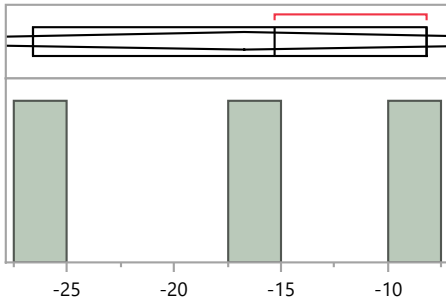
Mean	-22.1
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

MaS43 Distribution by Preparation Method

**MaS Distribution by Prep Method**

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

**Bias**



**Quantiles**

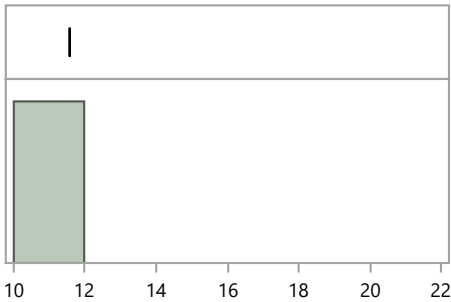
100.0%	maximum	-8.2
99.5%		-8.2
97.5%		-8.2
90.0%		-8.2
75.0%	quartile	-8.2
50.0%	median	-15.3
25.0%	quartile	-26.6
10.0%		-26.6
2.5%		-26.6
0.5%		-26.6
0.0%	minimum	-26.6

**Summary Statistics**

Mean	-16.7
Std Dev	9.3
Std Err Mean	5.4
Upper 95% Mean	6.4
Lower 95% Mean	-39.8
N	3.0

**Distributions Analyte\_Method=Nickel-63 Total dissolution by fusion**

**Bias**



**Quantiles**

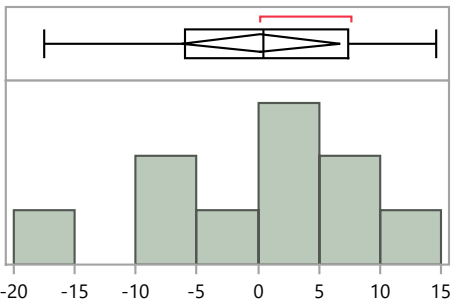
100.0%	maximum	11.6
99.5%		11.6
97.5%		11.6
90.0%		11.6
75.0%	quartile	11.6
50.0%	median	11.6
25.0%	quartile	11.6
10.0%		11.6
2.5%		11.6
0.5%		11.6
0.0%	minimum	11.6

**Summary Statistics**

Mean	11.6
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

**Distributions Analyte\_Method=Plutonium-238 Acid dissolution with hydrofluoric acid**

**Bias**



**Quantiles**

100.0%	maximum	14.6
99.5%		14.6
97.5%		14.6
90.0%		13.9
75.0%	quartile	7.4
50.0%	median	0.5
25.0%	quartile	-6.0
10.0%		-16.6
2.5%		-17.5
0.5%		-17.5
0.0%	minimum	-17.5

**Summary Statistics**

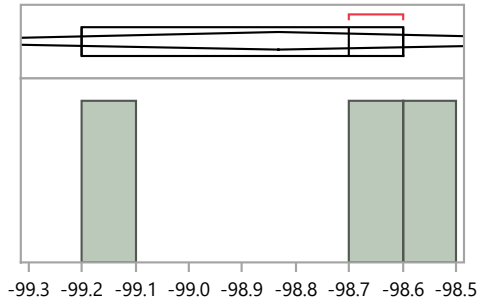
Mean	0.2
Std Dev	9.1
Std Err Mean	2.9
Upper 95% Mean	6.8
Lower 95% Mean	-6.3
N	10.0

MaS43 Distribution by Preparation Method

**MaS Distribution by Prep Method**

**Distributions Analyte\_Method=Plutonium-238 Acid leaching without hydrofluoric acid**

**Bias**



**Quantiles**

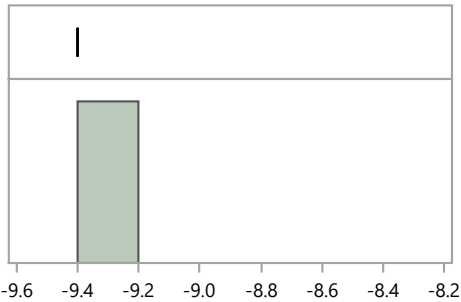
100.0%	maximum	-98.6
99.5%		-98.6
97.5%		-98.6
90.0%		-98.6
75.0%	quartile	-98.6
50.0%	median	-98.7
25.0%	quartile	-99.2
10.0%		-99.2
2.5%		-99.2
0.5%		-99.2
0.0%	minimum	-99.2

**Summary Statistics**

Mean	-98.8
Std Dev	0.3
Std Err Mean	0.2
Upper 95% Mean	-98.0
Lower 95% Mean	-99.6
N	3.0

**Distributions Analyte\_Method=Plutonium-238 Coprecipitation, acidified**

**Bias**



**Quantiles**

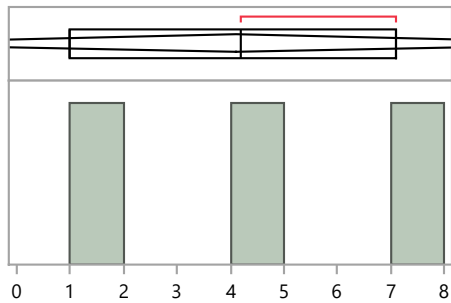
100.0%	maximum	-9.4
99.5%		-9.4
97.5%		-9.4
90.0%		-9.4
75.0%	quartile	-9.4
50.0%	median	-9.4
25.0%	quartile	-9.4
10.0%		-9.4
2.5%		-9.4
0.5%		-9.4
0.0%	minimum	-9.4

**Summary Statistics**

Mean	-9.4
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

**Distributions Analyte\_Method=Plutonium-238 Other**

**Bias**



**Quantiles**

100.0%	maximum	7.1
99.5%		7.1
97.5%		7.1
90.0%		7.1
75.0%	quartile	7.1
50.0%	median	4.2
25.0%	quartile	1.0
10.0%		1.0
2.5%		1.0
0.5%		1.0
0.0%	minimum	1.0

**Summary Statistics**

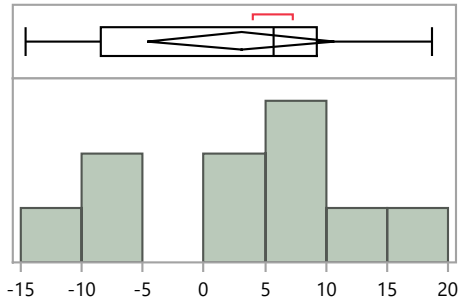
Mean	4.1
Std Dev	3.1
Std Err Mean	1.8
Upper 95% Mean	11.7
Lower 95% Mean	-3.5
N	3.0

MaS43 Distribution by Preparation Method

**MaS Distribution by Prep Method**

**Distributions Analyte\_Method=Plutonium-238 Total dissolution by fusion**

**Bias**



**Quantiles**

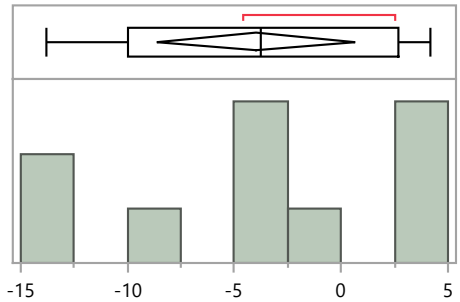
100.0%	maximum	18.7
99.5%		18.7
97.5%		18.7
90.0%		18.3
75.0%	quartile	9.2
50.0%	median	5.7
25.0%	quartile	-8.5
10.0%		-14.1
2.5%		-14.6
0.5%		-14.6
0.0%	minimum	-14.6

**Summary Statistics**

Mean	3.1
Std Dev	10.7
Std Err Mean	3.4
Upper 95% Mean	10.7
Lower 95% Mean	-4.6
N	10.0

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

**Bias**



**Quantiles**

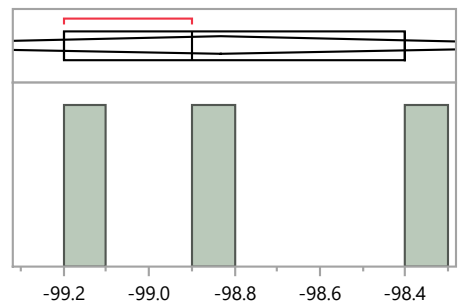
100.0%	maximum	4.2
99.5%		4.2
97.5%		4.2
90.0%		4.1
75.0%	quartile	2.7
50.0%	median	-3.8
25.0%	quartile	-10.0
10.0%		-13.8
2.5%		-13.8
0.5%		-13.8
0.0%	minimum	-13.8

**Summary Statistics**

Mean	-4.0
Std Dev	6.5
Std Err Mean	2.1
Upper 95% Mean	0.7
Lower 95% Mean	-8.6
N	10.0

**Distributions Analyte\_Method=Plutonium-239/240 Acid leaching without hydrofluoric acid**

**Bias**



**Quantiles**

100.0%	maximum	-98.4
99.5%		-98.4
97.5%		-98.4
90.0%		-98.4
75.0%	quartile	-98.4
50.0%	median	-98.9
25.0%	quartile	-99.2
10.0%		-99.2
2.5%		-99.2
0.5%		-99.2
0.0%	minimum	-99.2

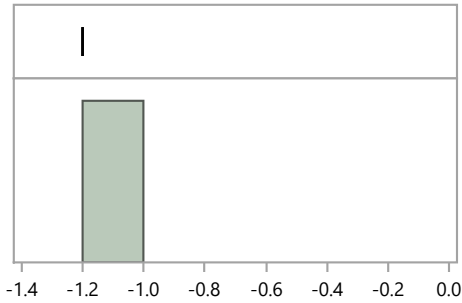
**Summary Statistics**

Mean	-98.8
Std Dev	0.4
Std Err Mean	0.2
Upper 95% Mean	-97.8
Lower 95% Mean	-99.8
N	3.0

**MaS Distribution by Prep Method**

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

**Bias**



**Quantiles**

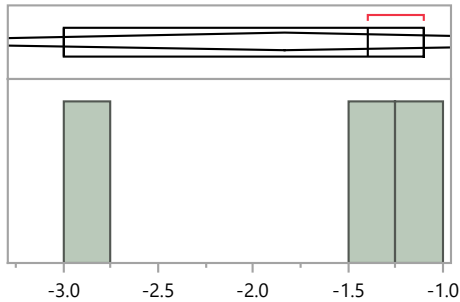
100.0%	maximum	-1.2
99.5%		-1.2
97.5%		-1.2
90.0%		-1.2
75.0%	quartile	-1.2
50.0%	median	-1.2
25.0%	quartile	-1.2
10.0%		-1.2
2.5%		-1.2
0.5%		-1.2
0.0%	minimum	-1.2

**Summary Statistics**

Mean	-1.2
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

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

**Bias**



**Quantiles**

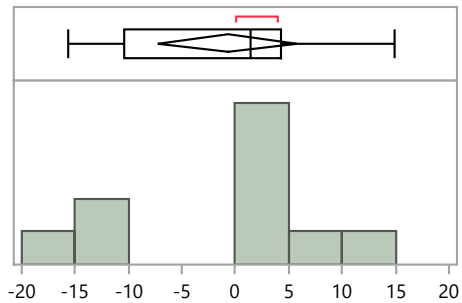
100.0%	maximum	-1.1
99.5%		-1.1
97.5%		-1.1
90.0%		-1.1
75.0%	quartile	-1.1
50.0%	median	-1.4
25.0%	quartile	-3.0
10.0%		-3.0
2.5%		-3.0
0.5%		-3.0
0.0%	minimum	-3.0

**Summary Statistics**

Mean	-1.8
Std Dev	1.0
Std Err Mean	0.6
Upper 95% Mean	0.7
Lower 95% Mean	-4.4
N	3.0

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

**Bias**



**Quantiles**

100.0%	maximum	14.9
99.5%		14.9
97.5%		14.9
90.0%		13.9
75.0%	quartile	4.2
50.0%	median	1.4
25.0%	quartile	-10.3
10.0%		-15.2
2.5%		-15.7
0.5%		-15.7
0.0%	minimum	-15.7

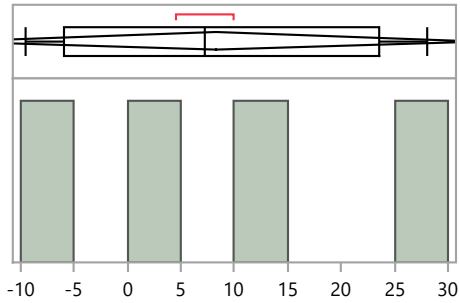
**Summary Statistics**

Mean	-0.7
Std Dev	9.1
Std Err Mean	2.9
Upper 95% Mean	5.8
Lower 95% Mean	-7.2
N	10.0

**MaS Distribution by Prep Method**

**Distributions Analyte\_Method=Potassium-40 EPA 901.1, Gamma Emitting, 600/4-80-032**

**Bias**



**Quantiles**

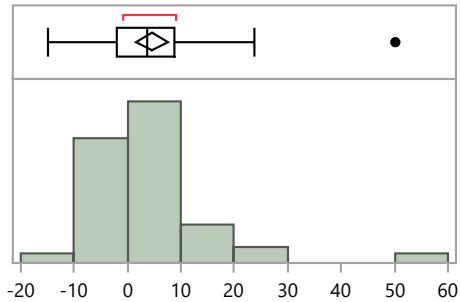
100.0%	maximum	28.0
99.5%		28.0
97.5%		28.0
90.0%		28.0
75.0%	quartile	23.5
50.0%	median	7.3
25.0%	quartile	-6.0
10.0%		-9.5
2.5%		-9.5
0.5%		-9.5
0.0%	minimum	-9.5

**Summary Statistics**

Mean	8.3
Std Dev	15.5
Std Err Mean	7.8
Upper 95% Mean	32.9
Lower 95% Mean	-16.4
N	4.0

**Distributions Analyte\_Method=Potassium-40 No preparation - analyzed as received**

**Bias**



**Quantiles**

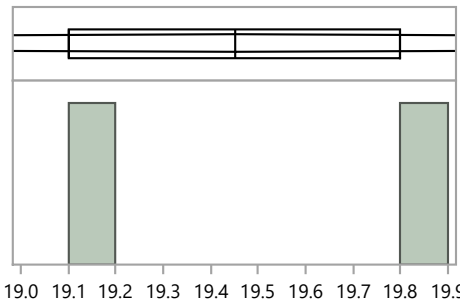
100.0%	maximum	50.1
99.5%		50.1
97.5%		44.2
90.0%		16.4
75.0%	quartile	8.7
50.0%	median	3.8
25.0%	quartile	-1.9
10.0%		-6.6
2.5%		-13.2
0.5%		-14.8
0.0%	minimum	-14.8

**Summary Statistics**

Mean	4.7
Std Dev	10.4
Std Err Mean	1.5
Upper 95% Mean	7.7
Lower 95% Mean	1.7
N	48.0

**Distributions Analyte\_Method=Potassium-40 Other**

**Bias**



**Quantiles**

100.0%	maximum	19.8
99.5%		19.8
97.5%		19.8
90.0%		19.8
75.0%	quartile	19.8
50.0%	median	19.5
25.0%	quartile	19.1
10.0%		19.1
2.5%		19.1
0.5%		19.1
0.0%	minimum	19.1

**Summary Statistics**

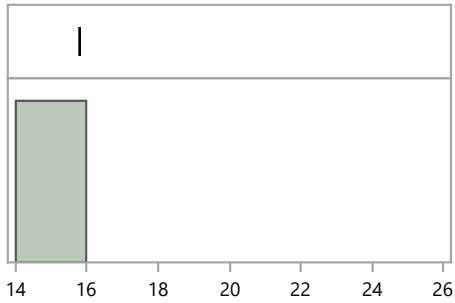
Mean	19.5
Std Dev	0.5
Std Err Mean	0.3
Upper 95% Mean	23.9
Lower 95% Mean	15.0
N	2.0

MaS43 Distribution by Preparation Method

**MaS Distribution by Prep Method**

**Distributions Analyte\_Method=Potassium-40 Total dissolution by fusion**

Bias



**Quantiles**

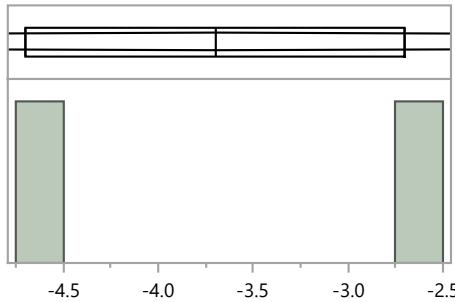
100.0%	maximum	15.8
99.5%		15.8
97.5%		15.8
90.0%		15.8
75.0%	quartile	15.8
50.0%	median	15.8
25.0%	quartile	15.8
10.0%		15.8
2.5%		15.8
0.5%		15.8
0.0%	minimum	15.8

**Summary Statistics**

Mean	15.8
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

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

Bias



**Quantiles**

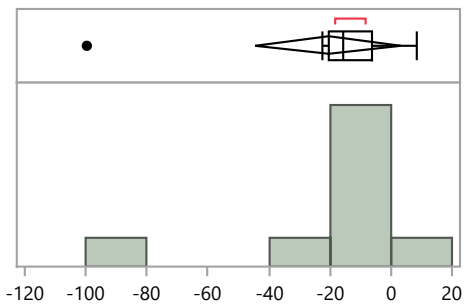
100.0%	maximum	-2.7
99.5%		-2.7
97.5%		-2.7
90.0%		-2.7
75.0%	quartile	-2.7
50.0%	median	-3.7
25.0%	quartile	-4.7
10.0%		-4.7
2.5%		-4.7
0.5%		-4.7
0.0%	minimum	-4.7

**Summary Statistics**

Mean	-3.7
Std Dev	1.4
Std Err Mean	1.0
Upper 95% Mean	9.0
Lower 95% Mean	-16.4
N	2.0

**Distributions Analyte\_Method=Strontium-90 Acid leaching without hydrofluoric acid**

Bias



**Quantiles**

100.0%	maximum	8.6
99.5%		8.6
97.5%		8.6
90.0%		8.6
75.0%	quartile	-6.1
50.0%	median	-15.8
25.0%	quartile	-20.4
10.0%		-99.6
2.5%		-99.6
0.5%		-99.6
0.0%	minimum	-99.6

**Summary Statistics**

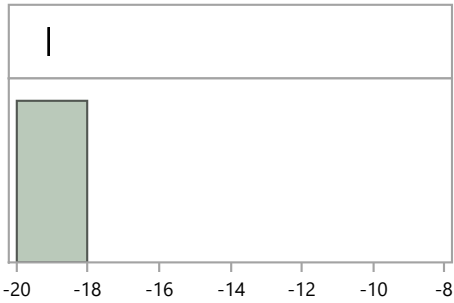
Mean	-20.6
Std Dev	31.1
Std Err Mean	10.4
Upper 95% Mean	3.3
Lower 95% Mean	-44.4
N	9.0

MaS43 Distribution by Preparation Method

**MaS Distribution by Prep Method**

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

**Bias**



**Quantiles**

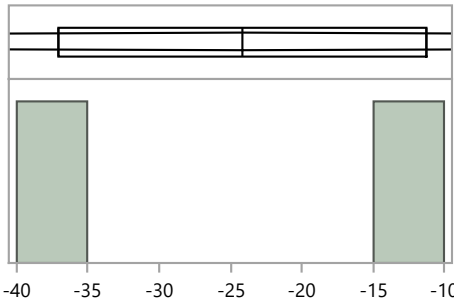
100.0%	maximum	-19.1
99.5%		-19.1
97.5%		-19.1
90.0%		-19.1
75.0%	quartile	-19.1
50.0%	median	-19.1
25.0%	quartile	-19.1
10.0%		-19.1
2.5%		-19.1
0.5%		-19.1
0.0%	minimum	-19.1

**Summary Statistics**

Mean	-19.1
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

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

**Bias**



**Quantiles**

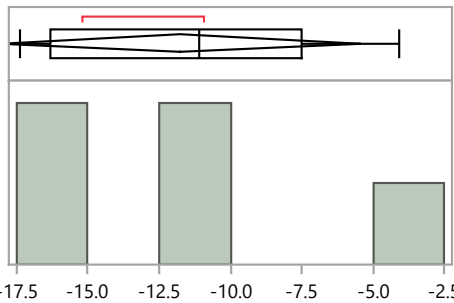
100.0%	maximum	-11.2
99.5%		-11.2
97.5%		-11.2
90.0%		-11.2
75.0%	quartile	-11.2
50.0%	median	-24.2
25.0%	quartile	-37.1
10.0%		-37.1
2.5%		-37.1
0.5%		-37.1
0.0%	minimum	-37.1

**Summary Statistics**

Mean	-24.2
Std Dev	18.3
Std Err Mean	13.0
Upper 95% Mean	140.4
Lower 95% Mean	-188.7
N	2.0

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

**Bias**



**Quantiles**

100.0%	maximum	-4.1
99.5%		-4.1
97.5%		-4.1
90.0%		-4.1
75.0%	quartile	-7.5
50.0%	median	-11.1
25.0%	quartile	-16.3
10.0%		-17.4
2.5%		-17.4
0.5%		-17.4
0.0%	minimum	-17.4

**Summary Statistics**

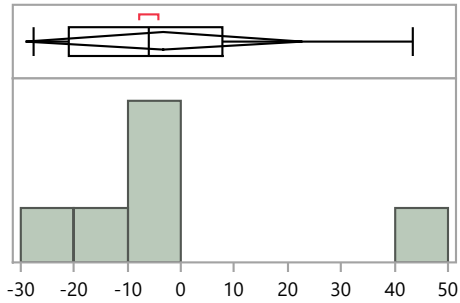
Mean	-11.7
Std Dev	5.1
Std Err Mean	2.3
Upper 95% Mean	-5.4
Lower 95% Mean	-18.1
N	5.0



**MaS Distribution by Prep Method**

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

**Bias**



**Quantiles**

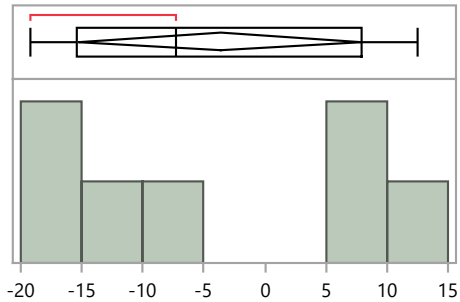
100.0%	maximum	43.5
99.5%		43.5
97.5%		43.5
90.0%		43.5
75.0%	quartile	7.8
50.0%	median	-6.1
25.0%	quartile	-21.1
10.0%		-27.5
2.5%		-27.5
0.5%		-27.5
0.0%	minimum	-27.5

**Summary Statistics**

Mean	-3.2
Std Dev	24.7
Std Err Mean	10.1
Upper 95% Mean	22.7
Lower 95% Mean	-29.1
N	6.0

**Distributions Analyte\_Method=Uranium-234 Acid dissolution with hydrofluoric acid**

**Bias**



**Quantiles**

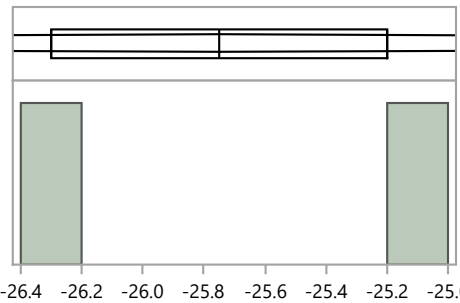
100.0%	maximum	12.5
99.5%		12.5
97.5%		12.5
90.0%		12.5
75.0%	quartile	7.9
50.0%	median	-7.3
25.0%	quartile	-15.4
10.0%		-19.2
2.5%		-19.2
0.5%		-19.2
0.0%	minimum	-19.2

**Summary Statistics**

Mean	-3.6
Std Dev	12.5
Std Err Mean	4.7
Upper 95% Mean	8.0
Lower 95% Mean	-15.2
N	7.0

**Distributions Analyte\_Method=Uranium-234 Acid leaching without hydrofluoric acid**

**Bias**



**Quantiles**

100.0%	maximum	-25.2
99.5%		-25.2
97.5%		-25.2
90.0%		-25.2
75.0%	quartile	-25.2
50.0%	median	-25.8
25.0%	quartile	-26.3
10.0%		-26.3
2.5%		-26.3
0.5%		-26.3
0.0%	minimum	-26.3

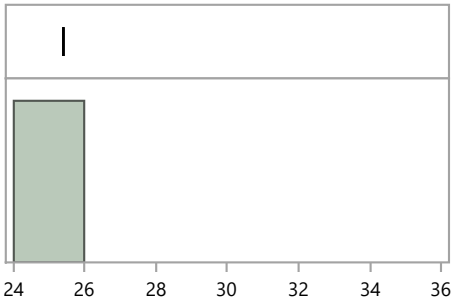
**Summary Statistics**

Mean	-25.8
Std Dev	0.8
Std Err Mean	0.6
Upper 95% Mean	-18.8
Lower 95% Mean	-32.7
N	2.0

**MaS Distribution by Prep Method**

**Distributions Analyte\_Method=Uranium-234 EPA 908, Uranium-Radiochemical Method, 600/4/80-032**

**Bias**



**Quantiles**

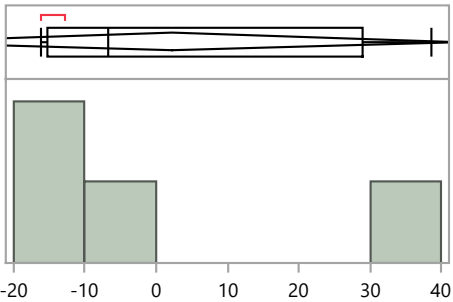
100.0%	maximum	25.4
99.5%		25.4
97.5%		25.4
90.0%		25.4
75.0%	quartile	25.4
50.0%	median	25.4
25.0%	quartile	25.4
10.0%		25.4
2.5%		25.4
0.5%		25.4
0.0%	minimum	25.4

**Summary Statistics**

Mean	25.4
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

**Distributions Analyte\_Method=Uranium-234 Other**

**Bias**



**Quantiles**

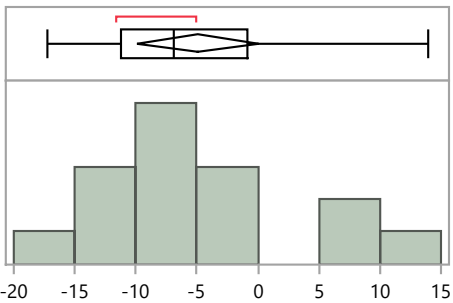
100.0%	maximum	38.7
99.5%		38.7
97.5%		38.7
90.0%		38.7
75.0%	quartile	28.9
50.0%	median	-6.7
25.0%	quartile	-15.3
10.0%		-16.2
2.5%		-16.2
0.5%		-16.2
0.0%	minimum	-16.2

**Summary Statistics**

Mean	2.3
Std Dev	25.2
Std Err Mean	12.6
Upper 95% Mean	42.4
Lower 95% Mean	-37.8
N	4.0

**Distributions Analyte\_Method=Uranium-234 Total dissolution by fusion**

**Bias**



**Quantiles**

100.0%	maximum	13.9
99.5%		13.9
97.5%		13.9
90.0%		11.3
75.0%	quartile	-0.8
50.0%	median	-6.9
25.0%	quartile	-11.2
10.0%		-15.8
2.5%		-17.2
0.5%		-17.2
0.0%	minimum	-17.2

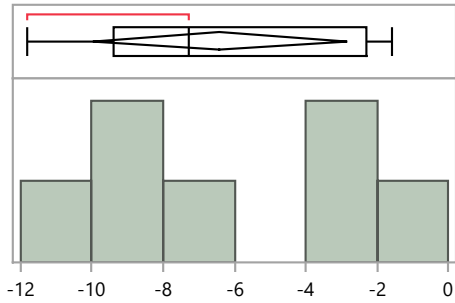
**Summary Statistics**

Mean	-4.9
Std Dev	8.9
Std Err Mean	2.3
Upper 95% Mean	0.1
Lower 95% Mean	-9.8
N	15.0

**MaS Distribution by Prep Method**

**Distributions Analyte\_Method=Uranium-238 Acid dissolution with hydrofluoric acid**

**Bias**



**Quantiles**

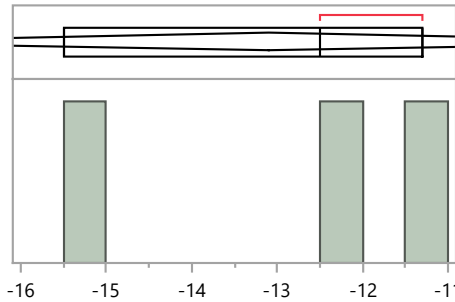
100.0%	maximum	-1.6
99.5%		-1.6
97.5%		-1.6
90.0%		-1.6
75.0%	quartile	-2.3
50.0%	median	-7.3
25.0%	quartile	-9.4
10.0%		-11.8
2.5%		-11.8
0.5%		-11.8
0.0%	minimum	-11.8

**Summary Statistics**

Mean	-6.4
Std Dev	3.9
Std Err Mean	1.5
Upper 95% Mean	-2.8
Lower 95% Mean	-10.0
N	7.0

**Distributions Analyte\_Method=Uranium-238 Acid leaching without hydrofluoric acid**

**Bias**



**Quantiles**

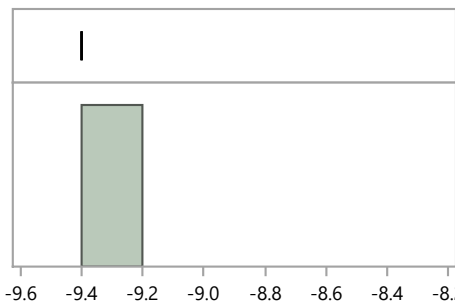
100.0%	maximum	-11.3
99.5%		-11.3
97.5%		-11.3
90.0%		-11.3
75.0%	quartile	-11.3
50.0%	median	-12.5
25.0%	quartile	-15.5
10.0%		-15.5
2.5%		-15.5
0.5%		-15.5
0.0%	minimum	-15.5

**Summary Statistics**

Mean	-13.1
Std Dev	2.2
Std Err Mean	1.2
Upper 95% Mean	-7.7
Lower 95% Mean	-18.5
N	3.0

**Distributions Analyte\_Method=Uranium-238 EPA 907, Actinide Elements, 600/4/80-032**

**Bias**



**Quantiles**

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

**Summary Statistics**

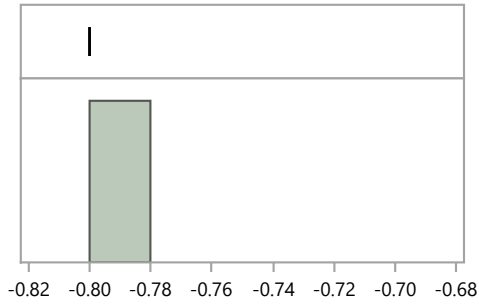
Mean	-9.4
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

MaS43 Distribution by Preparation Method

**MaS Distribution by Prep Method**

**Distributions Analyte\_Method=Uranium-238 EPA 908, Uranium-Radiochemical Method, 600/4/80-032**

**Bias**



**Quantiles**

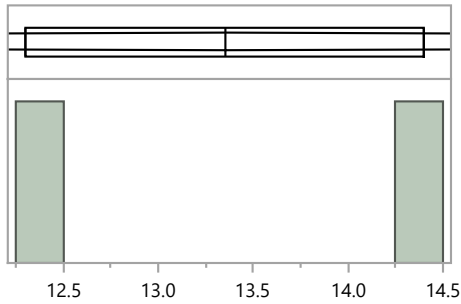
100.0%	maximum	-0.8
99.5%		-0.8
97.5%		-0.8
90.0%		-0.8
75.0%	quartile	-0.8
50.0%	median	-0.8
25.0%	quartile	-0.8
10.0%		-0.8
2.5%		-0.8
0.5%		-0.8
0.0%	minimum	-0.8

**Summary Statistics**

Mean	-0.8
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

**Distributions Analyte\_Method=Uranium-238 No preparation - analyzed as received**

**Bias**



**Quantiles**

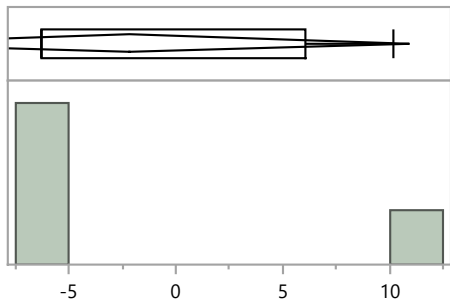
100.0%	maximum	14.4
99.5%		14.4
97.5%		14.4
90.0%		14.4
75.0%	quartile	14.4
50.0%	median	13.4
25.0%	quartile	12.3
10.0%		12.3
2.5%		12.3
0.5%		12.3
0.0%	minimum	12.3

**Summary Statistics**

Mean	13.4
Std Dev	1.5
Std Err Mean	1.1
Upper 95% Mean	26.7
Lower 95% Mean	0.0
N	2.0

**Distributions Analyte\_Method=Uranium-238 Other**

**Bias**



**Quantiles**

100.0%	maximum	10.2
99.5%		10.2
97.5%		10.2
90.0%		10.2
75.0%	quartile	6.1
50.0%	median	-6.3
25.0%	quartile	-6.3
10.0%		-6.3
2.5%		-6.3
0.5%		-6.3
0.0%	minimum	-6.3

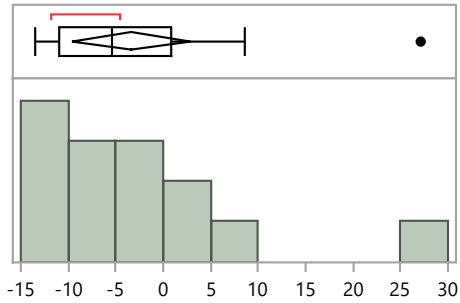
**Summary Statistics**

Mean	-2.2
Std Dev	8.3
Std Err Mean	4.1
Upper 95% Mean	11.0
Lower 95% Mean	-15.3
N	4.0

**MaS Distribution by Prep Method**

**Distributions Analyte\_Method=Uranium-238 Total dissolution by fusion**

**Bias**



**Quantiles**

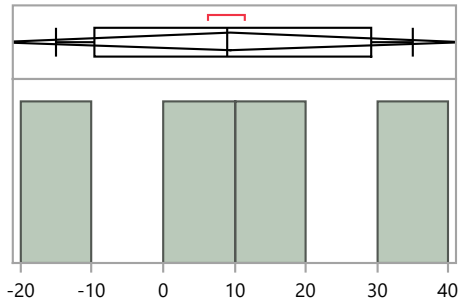
100.0%	maximum	27.1
99.5%		27.1
97.5%		27.1
90.0%		17.9
75.0%	quartile	0.9
50.0%	median	-5.4
25.0%	quartile	-11.0
10.0%		-12.6
2.5%		-13.5
0.5%		-13.5
0.0%	minimum	-13.5

**Summary Statistics**

Mean	-3.3
Std Dev	10.7
Std Err Mean	2.9
Upper 95% Mean	2.8
Lower 95% Mean	-9.5
N	14.0

**Distributions Analyte\_Method=Zinc-65 EPA 901.1, Gamma Emitting, 600/4-80-032**

**Bias**



**Quantiles**

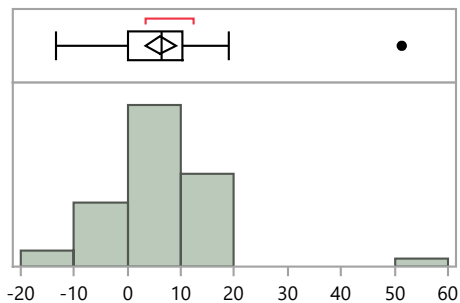
100.0%	maximum	35.1
99.5%		35.1
97.5%		35.1
90.0%		35.1
75.0%	quartile	29.2
50.0%	median	9.0
25.0%	quartile	-9.7
10.0%		-15.1
2.5%		-15.1
0.5%		-15.1
0.0%	minimum	-15.1

**Summary Statistics**

Mean	9.5
Std Dev	20.6
Std Err Mean	10.3
Upper 95% Mean	42.3
Lower 95% Mean	-23.3
N	4.0

**Distributions Analyte\_Method=Zinc-65 No preparation - analyzed as received**

**Bias**



**Quantiles**

100.0%	maximum	51.3
99.5%		51.3
97.5%		44.0
90.0%		14.8
75.0%	quartile	10.3
50.0%	median	6.4
25.0%	quartile	0.0
10.0%		-4.3
2.5%		-12.8
0.5%		-13.4
0.0%	minimum	-13.4

**Summary Statistics**

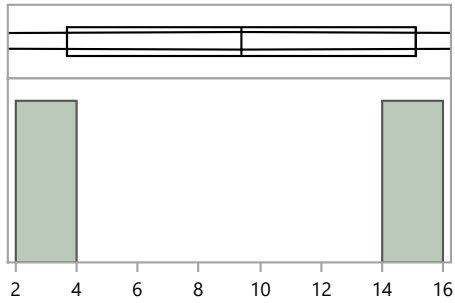
Mean	6.1
Std Dev	9.7
Std Err Mean	1.4
Upper 95% Mean	9.0
Lower 95% Mean	3.3
N	48.0

MaS43 Distribution by Preparation Method

**MaS Distribution by Prep Method**

**Distributions Analyte\_Method=Zinc-65 Other**

**Bias**



**Quantiles**

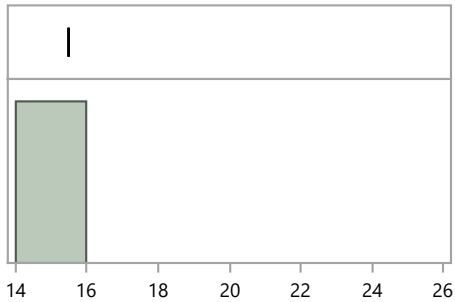
100.0%	maximum	15.1
99.5%		15.1
97.5%		15.1
90.0%		15.1
75.0%	quartile	15.1
50.0%	median	9.4
25.0%	quartile	3.7
10.0%		3.7
2.5%		3.7
0.5%		3.7
0.0%	minimum	3.7

**Summary Statistics**

Mean	9.4
Std Dev	8.1
Std Err Mean	5.7
Upper 95% Mean	81.8
Lower 95% Mean	-63.0
N	2.0

**Distributions Analyte\_Method=Zinc-65 Total dissolution by fusion**

**Bias**



**Quantiles**

100.0%	maximum	15.5
99.5%		15.5
97.5%		15.5
90.0%		15.5
75.0%	quartile	15.5
50.0%	median	15.5
25.0%	quartile	15.5
10.0%		15.5
2.5%		15.5
0.5%		15.5
0.0%	minimum	15.5

**Summary Statistics**

Mean	15.5
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0