E M L ENVIRONMENTAL MEASUREMENTS LABORATORY

Report of the Department of Energy,
Office of Environmental Management,
Quality Assessment Program,
Inorganic Intercomparison Study

Pamela D. Greenlaw

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**REPORT OF THE DEPARTMENT OF ENERGY,
OFFICE OF ENVIRONMENTAL MANAGEMENT,
QUALITY ASSESSMENT PROGRAM,
INORGANIC INTERCOMPARISON STUDY**

Pamela D. Greenlaw

**Environmental Measurements Laboratory
U. S. Department of Energy
New York, NY 10014-4811**

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QAP 44 Soil Inorganic Intercomparison Study

Data for inorganic constituents of the QAP soil sample were collected as part of this distribution. This was a voluntary intercomparison study. The samples were analyzed for RCRA metals using methods 3050 and 3051 for digestion. Unfortunately the measured values for the elements varied with the digestion method. The value from the 3050 digestion seemed to be most comparable with the values reported by the other participants so that value was used for the statistical comparison with the participating laboratories. The microwave values are reported as well. We are planning to research the discrepancies between digestion methods and provide more information in the next QAP distribution.

ACKNOWLEDGEMENT:

The US Environmental Protection Agency Region II Technical Support Branch provided confirmatory analysis of the sample for EML.

QAP 44 Results by Element

<u>Identification</u>	<u>Element</u>	<u>Result</u>	<u>Error</u>	<u>Microwave HNO3</u>	<u>Microwave HNO3/HCl</u>
EML	AL	7085.0	235.0	12850.0	14900.0
9603SOAG1	AL	7150.0	0.0		
9603SOAR1	AL	6200.0	620.0		
9603SOCH1	AL	12200.0	1220.0		
9603SODC1	AL	9200.0	920.0		
9603SOES1	AL	48100.0	0.0		
9603SOFG1	AL	0.0	4600.0		
9603SOGA1	AL	7580.0	0.0		
9603SOHL1	AL	7100.0	0.0		
9603SOIS1	AL	6940.0	0.0		
9603SOJP1	AL	41000.0	2000.0		
9603SOLA1	AL	6424.0	206.0		
9603SOLA1	AL	8423.0	281.0		
9603SOLA1	AL	9515.0	304.0		
9603SOLH1	AL	8360.0	0.0		
9603SONL1	AL	5369.0	0.0		
9603SOOB1	AL	6900.0	0.0		
9603SOOR1	AL	9200.0	20.0		
9603SOSC1	AL	7760.0	0.0		
9603SOSW1	AL	6500.0	0.0		
9603SOSW1	AL	6560.0	0.0		
9603SOSW1	AL	6700.0	0.0		
9603SOUC1	AL	10782.0	1078.2		
9603SOUP1	AL	7560.0	0.0		

Records printed: 24

Statistical Summary

(excluding outliers as determined by Kolmogorov-Smirnov Test)

Mean	7786
Standard Deviation	1638
Median	7150
15 percentile	6473
85 percentile	9310
N	21

EML results were determined using SW846 method 3050 hotplate digestion with ICP or graphite furnace AA determination. The samples did not appear to totally digest using this method so closed vessel microwave digestion, method 3051, was used resulting in higher analyte recovery.

QAP 44 Results by Element

<u>Identification</u>	<u>Element</u>	<u>Result</u>	<u>Error</u>	<u>Microwave HNO3</u>	<u>Microwave HNO3/HCl</u>
EML	AS	2.4	0.1	2.3	
9603SOAG1	AS	2.8	0.0		
9603SOAR1	AS	16.0	1.6		
9603SOCH1	AS	2.4	0.2		
9603SODC1	AS	3.0	0.3		
9603SOES1	AS	5.9	0.0		
9603SOFG1	AS	2.3	0.0		
9603SOGA1	AS	18.5	0.0		
9603SOHL1	AS	1.9	0.0		
9603SOIS1	AS	3.0	0.0		
9603SOJP1	AS	4.0	0.2		
9603SOLA1	AS	2.2	0.5		
9603SOLA1	AS	2.5	0.5		
9603SOLA1	AS	2.5	1.4		
9603SOLH1	AS	2.2	0.0		
9603SONA1	AS	3.8	0.0		
9603SONL1	AS	0.0	2.0		
9603SOOB1	AS	2.3	0.0		
9603SOSC1	AS	2.4	0.0		
9603SOSW1	AS	1.5	0.0		
9603SOSW1	AS	1.6	0.0		
9603SOSW1	AS	1.6	0.0		
9603SOUC1	AS	1.3	0.1		

Records printed: 23

Statistical Summary

(excluding outliers as determined by Kolmogorov-Smirnov Test)

Mean	2.4
Standard Deviation	0.71
Median	2.4
15 percentile	1.6
85 percentile	2.7
N	19

EML results were determined using SW846 method 3050 hotplate digestion with ICP or graphite furnace AA determination. The samples did not appear to totally digest using this method so closed vessel microwave digestion, method 3051, was used resulting in higher analyte recovery.

QAP 44 Results by Element

<u>Identification</u>	<u>Element</u>	<u>Result</u>	<u>Error</u>	<u>Microwave HNO3</u>	<u>Microwave HNO3/HCl</u>
EML	BA	60.5	0.5	84.5	106.5
9603SOAG1	BA	60.7	0.0		
9603SOAR1	BA	54.0	5.4		
9603SOCH1	BA	69.1	6.9		
9603SODC1	BA	70.0	7.0		
9603SOES1	BA	229.0	0.0		
9603SOFG1	BA	46.0	0.0		
9603SOGA1	BA	59.5	0.0		
9603SOHL1	BA	60.0	0.0		
9603SOIS1	BA	62.8	0.0		
9603SOJP1	BA	190.0	0.0		
9603SOLA1	BA	56.0	7.0		
9603SOLA1	BA	66.2	8.3		
9603SOLA1	BA	72.0	2.0		
9603SOLH1	BA	67.5	0.0		
9603SONA1	BA	82.9	0.0		
9603SONL1	BA	51.7	0.0		
9603SOOB1	BA	60.0	0.0		
9603SOOR1	BA	71.1	0.3		
9603SOSC1	BA	63.1	0.0		
9603SOSW1	BA	59.2	0.0		
9603SOSW1	BA	59.6	0.0		
9603SOSW1	BA	60.7	0.0		
9603SOUC1	BA	73.4	7.3		
9603SOUP1	BA	66.3	0.0		

Records printed: 25

Statistical Summary

(excluding outliers as determined by Kolmogorov-Smirnov Test)

Mean	63.1
Standard Deviation	8.0
Median	60.7
15 percentile	55.9
85 percentile	71.1
N	23

EML results were determined using SW846 method 3050 hotplate digestion with ICP or graphite furnace AA determination. The samples did not appear to totally digest using this method so closed vessel microwave digestion, method 3051, was used resulting in higher analyte recovery.

QAP 44 Results by Element

<u>Identification</u>	<u>Element</u>	<u>Result</u>	<u>Error</u>	<u>Microwave HNO3</u>	<u>Microwave HNO3/HCl</u>
EML	CA	4050.0	30.0	3870.0	4190.0
9603SOAG1	CA	4480.0	0.0		
9603SOAR1	CA	3900.0	390.0		
9603SOCH1	CA	4650.0	465.0		
9603SODC1	CA	4400.0	440.0		
9603SOES1	CA	6100.0	0.0		
9603SOFG1	CA	4400.0	0.0		
9603SOGA1	CA	3850.0	0.0		
9603SOHL1	CA	4200.0	0.0		
9603SOIS1	CA	4640.0	0.0		
9603SOJP1	CA	5700.0	870.0		
9603SOLA1	CA	3871.0	248.0		
9603SOLA1	CA	4115.0	118.0		
9603SOLA1	CA	4187.0	174.0		
9603SOLH1	CA	4670.0	0.0		
9603SONL1	CA	3932.0	0.0		
9603SOOB1	CA	4000.0	0.0		
9603SOOR1	CA	4730.0	50.0		
9603SOSC1	CA	3950.0	0.0		
9603SOSW1	CA	4430.0	0.0		
9603SOSW1	CA	4450.0	0.0		
9603SOSW1	CA	4470.0	0.0		
9603SOUC1	CA	4073.0	407.0		
9603SOUP1	CA	4710.0	0.0		

Records printed: 24

Statistical Summary

(excluding outliers as determined by Kolmogorov-Smirnov Test)

Mean	4280
Standard Deviation	301
Median	4300
15 percentile	3926
85 percentile	4654
N	22

EML results were determined using SW846 method 3050 hotplate digestion with ICP or graphite furnace AA determination. The samples did not appear to totally digest using this method so closed vessel microwave digestion, method 3051, was used resulting in higher analyte recovery.

QAP 44 Results by Element

<u>Identification</u>	<u>Element</u>	<u>Result</u>	<u>Error</u>	<u>Microwave HNO3</u>	<u>Microwave HNO3/HCl</u>
EML	CD	<1		<1	<1
9603SOAG1	CD	0.29	0.0		
9603SOAR1	CD	0	0.5		
9603SOCH1	CD	0.218			
9603SODC1	CD	0.13	0.0		
9603SOES1	CD	0.083			
9603SOFG1	CD	0	0.0		
9603SOGA1	CD	1.8	0.0		
9603SOHL1	CD	0.03			
9603SOIS1	CD	0	0.0		
9603SOJP1	CD	7	0.0		
9603SOLA1	CD	0.256			
9603SOLA1	CD	0.279	0.1		
9603SOLA1	CD	0.492	0.1		
9603SOLH1	CD	0.23	0.0		
9603SONL1	CD	0	1.0		
9603SOOB1	CD	0			
9603SOOR1	CD	0.889	0.2		
9603SOSC1	CD	0	0.0		
9603SOSW1	CD	0.072	0.0		

Records printed: 20

Statistical Summary

(excluding outliers as determined by Kolmogorov-Smirnov Test)

Mean	0.22
Standard Deviation	0.13
Median	0.23
15 percentile	0.074
85 percentile	0.31
N	10

EML results were determined using SW846 method 3050 hotplate digestion with ICP or graphite furnace AA determination. The samples did not appear to totally digest using this method so closed vessel microwave digestion, method 3051, was used resulting in higher analyte recovery.

QAP 44 Results by Element

<u>Identification</u>	<u>Element</u>	<u>Result</u>	<u>Error</u>	<u>Microwave HNO3</u>	<u>Microwave HNO3/HCl</u>
EML	CR	12.5	0.5	18.5	21.5
9603SOAG1	CR	13.9	0.0		
9603SOAR1	CR	15.0	1.5		
9603SOCH1	CR	15.9	1.6		
9603SODC1	CR	19.0	1.9		
9603SOES1	CR	51.5	0.0		
9603SOFG1	CR	9.3	0.0		
9603SOGA1	CR	15.4	0.0		
9603SOHL1	CR	17.0	0.0		
9603SOIS1	CR	12.9	0.0		
9603SOJP1	CR	34.0	1.0		
9603SOLA1	CR	13.2	2.1		
9603SOLA1	CR	15.2	2.4		
9603SOLA1	CR	17.9	6.9		
9603SOLH1	CR	16.2	0.0		
9603SONA1	CR	22.2	0.0		
9603SONL1	CR	12.7	0.0		
9603SOOB1	CR	13.0	0.0		
9603SOOR1	CR	17.0	0.2		
9603SOSC1	CR	16.3	0.0		
9603SOSW1	CR	11.4	0.0		
9603SOSW1	CR	11.6	0.0		
9603SOSW1	CR	11.8	0.0		
9603SOUC1	CR	31.0	3.1		
9603SOUP1	CR	14.5	0.0		

Records printed: 25

Statistical Summary

(excluding outliers as determined by Kolmogorov-Smirnov Test)

Mean	14.7
Standard Deviation	2.9
Median	14.8
15 percentile	11.8
85 percentile	17.2
N	22

EML results were determined using SW846 method 3050 hotplate digestion with ICP or graphite furnace AA determination. The samples did not appear to totally digest using this method so closed vessel microwave digestion, method 3051, was used resulting in higher analyte recovery.

QAP 44 Results by Element

<u>Identification</u>	<u>Element</u>	<u>Result</u>	<u>Error</u>	<u>Microwave HNO3</u>	<u>Microwave HNO3/HCl</u>
EML	CU	9.5	1.5	10.5	11.0
9603SOAG1	CU	8.8	0.0		
9603SOAR1	CU	9.0	0.9		
9603SOCH1	CU	14.9	1.5		
9603SODC1	CU	11.0	1.1		
9603SOES1	CU	7.1	0.0		
9603SOFG1	CU	6.4	0.0		
9603SOGA1	CU	8.0	0.0		
9603SOHL1	CU	8.6	0.0		
9603SOIS1	CU	8.0	0.0		
9603SOJP1	CU	300.0	0.0		
9603SOLA1	CU	6.9	0.5		
9603SOLA1	CU	7.6	0.5		
9603SOLA1	CU	7.9	0.6		
9603SONL1	CU	6.0	0.0		
9603SOOB1	CU	8.0	0.0		
9603SOOR1	CU	10.0	0.3		
9603SOSC1	CU	8.3	0.0		
9603SOSW1	CU	8.1	0.0		
9603SOSW1	CU	8.3	0.0		
9603SOSW1	CU	8.4	0.0		
9603SOUC1	CU	10.7	1.1		
9603SOUP1	CU	9.4	0.0		

Records printed: 23

Statistical Summary

(excluding outliers as determined by Kolmogorov-Smirnov Test)

Mean	8.7
Standard Deviation	1.9
Median	8.3
15 percentile	7.0
85 percentile	10.1
N	22

EML results were determined using SW846 method 3050 hotplate digestion with ICP or graphite furnace AA determination. The samples did not appear to totally digest using this method so closed vessel microwave digestion, method 3051, was used resulting in higher analyte recovery.

QAP 44 Results by Element

<u>Identification</u>	<u>Element</u>	<u>Result</u>	<u>Error</u>	<u>Microwave HNO3</u>	<u>Microwave HNO3/HCl</u>
EML	FE	11450.0	250.0	14400.0	12750.0
9603SOAG1	FE	13600.0	0.0		
9603SOAR1	FE	10000.0	1000.0		
9603SOCH1	FE	14200.0	1420.0		
9603SODC1	FE	11900.0	0.0		
9603SOES1	FE	13700.0	0.0		
9603SOFG1	FE	8100.0	0.0		
9603SOGA1	FE	10100.0	0.0		
9603SOHL1	FE	12000.0	0.0		
9603SOIS1	FE	11900.0	0.0		
9603SOJP1	FE	15000.0	300.0		
9603SOLA1	FE	10238.0	362.0		
9603SOLA1	FE	11776.0	365.0		
9603SOLA1	FE	12320.0	380.0		
9603SOLH1	FE	12600.0	0.0		
9603SONL1	FE	10750.0	0.0		
9603SOOB1	FE	12000.0	0.0		
9603SOOR1	FE	13010.0	10.0		
9603SOSC1	FE	11500.0	0.0		
9603SOSW1	FE	10800.0	0.0		
9603SOSW1	FE	11000.0	0.0		
9603SOUC1	FE	13074.0	1307.4		
9603SOUP1	FE	11900.0	0.0		

Records printed: 23

Statistical Summary

(excluding outliers as determined by Kolmogorov-Smirnov Test)

Mean	11866
Standard Deviation	1538
Median	11900
15 percentile	10231
85 percentile	13605
N	23

EML results were determined using SW846 method 3050 hotplate digestion with ICP or graphite furnace AA determination. The samples did not appear to totally digest using this method so closed vessel microwave digestion, method 3051, was used resulting in higher analyte recovery.

QAP 44 Results by Element

<u>Identification</u>	<u>Element</u>	<u>Result</u>	<u>Error</u>	<u>Microwave HNO3</u>	<u>Microwave HNO3/HCl</u>
EML	MG	2845.0	5.0	3095.0	3410.0
9603SOAG1	MG	2990.0	0.0		
9603SOAR1	MG	2600.0	260.0		
9603SOCH1	MG	3470.0	347.0		
9603SODC1	MG	380.0	38.0		
9603SOES1	MG	2140.0	0.0		
9603SOFG1	MG	2300.0	0.0		
9603SOGA1	MG	2790.0	0.0		
9603SOHL1	MG	3200.0	0.0		
9603SOIS1	MG	3120.0	0.0		
9603SOJP1	MG	12000.0	1100.0		
9603SOLA1	MG	2780.0	50.0		
9603SOLA1	MG	3005.0	54.0		
9603SOLA1	MG	3116.0	56.0		
9603SOLH1	MG	3290.0	0.0		
9603SONL1	MG	2528.0	0.0		
9603SOOB1	MG	2700.0	0.0		
9603SOOR1	MG	3250.0	10.0		
9603SOSC1	MG	2940.0	0.0		
9603SOSW1	MG	2830.0	0.0		
9603SOSW1	MG	2850.0	0.0		
9603SOUC1	MG	3325.0	333.0		
9603SOUP1	MG	3290.0	0.0		

Records printed: 23

Statistical Summary

(excluding outliers as determined by Kolmogorov-Smirnov Test)

Mean	2922
Standard Deviation	344
Median	2940
15 percentile	2574
85 percentile	3290
N	21

EML results were determined using SW846 method 3050 hotplate digestion with ICP or graphite furnace AA determination. The samples did not appear to totally digest using this method so closed vessel microwave digestion, method 3051, was used resulting in higher analyte recovery.

QAP 44 Results by Element

<u>Identification</u>	<u>Element</u>	<u>Result</u>	<u>Error</u>	<u>Microwave HNO3</u>	<u>Microwave HNO3/HCl</u>
EML	MN	355.5	0.5	351.0	372.0
9603SOAG1	MN	380.0	0.0		
9603SOAR1	MN	340.0	34.0		
9603SOCH1	MN	390.0	39.0		
9603SODC1	MN	3100.0	310.0		
9603SOES1	MN	401.0	0.0		
9603SOFG1	MN	280.0	0.0		
9603SOGA1	MN	338.0	0.0		
9603SOHL1	MN	380.0	0.0		
9603SOIS1	MN	370.0	0.0		
9603SOJP1	MN	430.0	8.0		
9603SOLA1	MN	317.0	16.0		
9603SOLA1	MN	338.0	17.0		
9603SOLA1	MN	350.0	20.0		
9603SOLH1	MN	366.0	0.0		
9603SONL1	MN	342.0	0.0		
9603SOOB1	MN	350.0	0.0		
9603SOOR1	MN	372.0	1.0		
9603SOSC1	MN	353.0	0.0		
9603SOSW1	MN	369.0	0.0		
9603SOSW1	MN	371.0	0.0		
9603SOSW1	MN	372.0	0.0		
9603SOUC1	MN	401.0	40.1		
9603SOUP1	MN	406.0	0.0		

Records printed: 24

Statistical Summary

(excluding outliers as determined by Kolmogorov-Smirnov Test)

Mean	363
Standard Deviation	32
Median	369
15 percentile	338
85 percentile	401
N	23

EML results were determined using SW846 method 3050 hotplate digestion with ICP or graphite furnace AA determination. The samples did not appear to totally digest using this method so closed vessel microwave digestion, method 3051, was used resulting in higher analyte recovery.

QAP 44 Results by Element

<u>Identification</u>	<u>Element</u>	<u>Result</u>	<u>Error</u>	<u>Microwave HNO3</u>	<u>Microwave HNO3/HCl</u>
EML	NA	<500		<500	<500
9603SOAG1	NA	234	0.0		
9603SOAR1	NA	290	29.0		
9603SOCH1	NA	450	45.0		
9603SODC1	NA	340	34.0		
9603SOES1	NA	5040	0.0		
9603SOFG1	NA	170	0.0		
9603SOGA1	NA	301	0.0		
9603SOHL1	NA	380	0.0		
9603SOIS1	NA	283	0.0		
9603SOJP1	NA	7100	50.0		
9603SOLA1	NA	273	32.0		
9603SOLA1	NA	311	37.0		
9603SOLA1	NA	348	41.0		
9603SONL1	NA	0	2000.0		
9603SOOB1	NA	400	0.0		
9603SOOR1	NA	283	1.0		
9603SOSC1	NA	324	0.0		
9603SOSW1	NA	247	0.0		
9603SOSW1	NA	252	0.0		
9603SOSW1	NA	255	0.0		
9603SOUC1	NA	500	50.0		
9603SOUP1	NA	300	0.0		

Records printed: 23

Statistical Summary

(excluding outliers as determined by Kolmogorov-Smirnov Test)

Mean	313
Standard Deviation	76
Median	300
15 percentile	250
85 percentile	390
N	19

EML results were determined using SW846 method 3050 hotplate digestion with ICP or graphite furnace AA determination. The samples did not appear to totally digest using this method so closed vessel microwave digestion, method 3051, was used resulting in higher analyte recovery.

QAP 44 Results by Element

<u>Identification</u>	<u>Element</u>	<u>Result</u>	<u>Error</u>	<u>Microwave HNO3</u>	<u>Microwave HNO3/HCl</u>
EML	NI	24.5	0.5	26.0	26.0
9603SOAG1	NI	25.5	0.0		
9603SOAR1	NI	24.0	2.4		
9603SOCH1	NI	27.4	2.7		
9603SODC1	NI	27.0	2.7		
9603SOFG1	NI	20.0	0.0		
9603SOGA1	NI	25.2	0.0		
9603SOHL1	NI	28.0	0.0		
9603SOIS1	NI	25.7	0.0		
9603SOJP1	NI	60.0	0.0		
9603SOLA1	NI	34.4	2.3		
9603SOLA1	NI	35.0	2.0		
9603SOLA1	NI	38.9	2.6		
9603SOLH1	NI	28.9	0.0		
9603SONL1	NI	23.8	0.0		
9603SOOB1	NI	24.0	0.0		
9603SOOR1	NI	26.3	1.1		
9603SOSC1	NI	25.7	0.0		
9603SOSW1	NI	25.4	0.0		
9603SOSW1	NI	25.5	0.0		
9603SOSW1	NI	26.1	0.0		
9603SOUC1	NI	45.2	4.5		
9603SOUP1	NI	28.3	0.0		

Records printed: 23

Statistical Summary

(excluding outliers as determined by Kolmogorov-Smirnov Test)

Mean	26.5
Standard Deviation	3.4
Median	25.7
15 percentile	24
85 percentile	28.6
N	20

EML results were determined using SW846 method 3050 hotplate digestion with ICP or graphite furnace AA determination. The samples did not appear to totally digest using this method so closed vessel microwave digestion, method 3051, was used resulting in higher analyte recovery.

QAP 44 Results by Element

<u>Identification</u>	<u>Element</u>	<u>Result</u>	<u>Error</u>	<u>Microwave HNO3</u>	<u>Microwave HNO3/HCl</u>
EML	V	8.0	0.0	14.5	18.5
9603SOAG1	V	9.0	0.0		
9603SOAR1	V	7.2	0.7		
9603SOCH1	V	10.2	1.0		
9603SODC1	V	11.0	1.1		
9603SOES1	V	19.0	0.0		
9603SOFG1	V	5.8	0.0		
9603SOGA1	V	10.5	0.0		
9603SOHL1	V	9.3	0.0		
9603SOIS1	V	6.5	0.0		
9603SOJP1	V	34.0	2.9		
9603SOLA1	V	6.8	1.5		
9603SOLA1	V	9.7	2.1		
9603SOLA1	V	10.4	0.6		
9603SOLH1	V	10.0	0.0		
9603SONL1	V	0.0	10.0		
9603SOOB1	V	8.0	0.0		
9603SOOR1	V	10.7	0.2		
9603SOSC1	V	9.1	0.0		
9603SOSW1	V	7.9	0.0		
9603SOSW1	V	8.6	0.0		
9603SOSW1	V	8.9	0.0		
9603SOUC1	V	34.4	3.4		
9603SOUP1	V	9.3	0.0		

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Statistical Summary

(excluding outliers as determined by Kolmogorov-Smirnov Test)

Mean	8.8
Standard Deviation	1.4
Median	9.1
15 percentile	7.0
85 percentile	10.4
N	20

EML results were determined using SW846 method 3050 hotplate digestion with ICP or graphite furnace AA determination. The samples did not appear to totally digest using this method so closed vessel microwave digestion, method 3051, was used resulting in higher analyte recovery.

QAP 44 Results by Element

<u>Identification</u>	<u>Element</u>	<u>Result</u>	<u>Error</u>	<u>Microwave HNO3</u>	<u>Microwave HNO3/HCl</u>
EML	ZN	33.0	0.0	35.5	35.0
9603SOAG1	ZN	35.2	0.0		
9603SOAR1	ZN	33.0	3.3		
9603SOCH1	ZN	44.0	4.4		
9603SODC1	ZN	35.0	3.5		
9603SOES1	ZN	32.7	0.0		
9603SOFG1	ZN	25.0	0.0		
9603SOGA1	ZN	33.7	0.0		
9603SOHL1	ZN	38.0	0.0		
9603SOIS1	ZN	34.0	0.0		
9603SOJP1	ZN	35.0	3.0		
9603SOLA1	ZN	36.6	1.6		
9603SOLA1	ZN	39.4	1.7		
9603SOLA1	ZN	39.8	9.3		
9603SOLH1	ZN	38.0	0.0		
9603SONA1	ZN	45.0	0.0		
9603SONL1	ZN	30.2	0.0		
9603SOOB1	ZN	33.0	0.0		
9603SOOR1	ZN	41.0	0.5		
9603SOSC1	ZN	35.2	0.0		
9603SOSW1	ZN	33.9	0.0		
9603SOSW1	ZN	33.8	0.0		
9603SOSW1	ZN	34.7	0.0		
9603SOUC1	ZN	42.5	4.3		
9603SOUP1	ZN	38.1	0.0		

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Statistical Summary

(excluding outliers as determined by Kolmogorov-Smirnov Test)

Mean	36.0
Standard Deviation	4.4
Median	35.0
15 percentile	33.0
85 percentile	40.7
N	25

EML results were determined using SW846 method 3050 hotplate digestion with ICP or graphite furnace AA determination. The samples did not appear to totally digest using this method so closed vessel microwave digestion, method 3051, was used resulting in higher analyte recovery.

Participating Laboratories in EML QAP44

Laboratories Reporting Data

Code	Laboratory Name
AG	Paragon Analytics, Inc. , Fort Collins, CO
AR	Accu-Labs Research Inc. , Golden, CO
CH	California State Dept. Health Serv. Sanitation & Radiation Laborat, Berkeley, CA
DC	Datachem Laboratories , Salt Lake City, UT
ES	Environmental Sci. & Engr., Inc. Inorganic Analyt.Chem., Gainesville, FL
FG	FGL Environmental , Santa Paula, CA
GA	Lockheed Martin Rm. 333 Bldg X710, Pikton, OH
HL	Heritage Laboratories, Inc. , Romeoville, IL
IS	Quanterra- St. Louis , Earth City, MO
JP	Japan Chemical Analysis Center 295-3 Sanno-Cho, Chiba 263, Japan
LA	Analytical Services, CST-3 MS K484, Los Alamos, NM
LH	Lockheed Analytical Laboratory , Las Vegas, NV
NA	USEPA NAREL , Montgomery, AL
NL	FERMCO BLDG 15, room C-11, Cincinnati, OH
OB	OBG Laboratories , East Syracuse, NY
OR	Oak Ridge National Lab Bldg 4500-N Rm G-5, Oak Ridge, TN
SC	S-3 Division Maxwell Labs , La Jolla, CA
SW	Southwest Research Institute, Div. 01 P.O. Drawer 28510, San Antonio, TX
UC	Lockheed Martin RM 60 BLDG C-710, Paducah, KY
UP	Y-12 Plant, ASO, QC Laboratory 113C Union Valley Road, Oak Ridge, TN

Total Reporting Labs: 20

EML

**Environmental Measurements Laboratory
U. S. Department of Energy
201 Varick Street
New York, New York 10014-4811
U. S. A.**