



Department of Energy
Idaho Operations Office
850 Energy Drive
Idaho Falls, Idaho 83401-1563

Radiological and Environmental Sciences Laboratory
May 9, 2001

NRC Region III Laboratory
Mr. Gene Bonano
Laboratory Operations Spec
801 Warrenville Road
Lisle, IL 60532-4351

Subject: Laboratory results for the MAPEP-00-W8 water test session and MAPEP-01-S8 soil description

Dear Participant:

Laboratory Code: NRCQ02

If your facility participated in the MAPEP-00-W8 water test session, your laboratory results are enclosed. The acceptance criteria are listed at the end of the report. For radiological and stable inorganic analytes, a result with a bias $\leq 20\%$ of the reference value for the specified analyte is acceptable (flag = "A"); $20\% < \text{bias} \leq 30\%$ is acceptable with warning (flag = "W"); a bias $> 30\%$ is not acceptable (flag = "N"). For the semi-volatile organics, each laboratory was evaluated on an analyte by analyte basis using Z-scores as recommended by the International Standards Organization (ISO), "Proficiency testing by interlaboratory comparisons". The Z-Score was calculated as the laboratory result minus the biweight mean divided by the biweight standard deviation. The resulting Z-score may either be positive or negative. A laboratory will be considered to be acceptable, "A", in the analysis of the analyte if the absolute value of the Z-score does not exceed 2.0. If the absolute value of the Z-score is greater than 2.0, but less than or equal to 3.0, the result is considered acceptable but flagged as a Warning; "W". Calculated Z-scores below -3.0 or above $+3.0$ are considered Not Acceptable; "N".

If a result is flagged as not acceptable, please check for the correct units. Any flags associated with the reported uncertainty are for information purposes only. They are not currently part of the acceptance criteria. The statistical summary report provides a quick overview of all laboratory data. Your laboratory report and the full report for this study will be available for review on the Internet at <http://www.inel.gov/resl/mapep>. Please review the internet report for completeness as MAPEP is working toward a paperless performance reporting system for sample MAPEP-01-S8. This process will REQUIRE an e-mail address in the data reporting system.

A sample description for the MAPEP-01-S8 soil sample, scheduled for distribution in July 2001, is also enclosed. Participation in the MAPEP requires that your laboratory accept title to the sample (i.e., excess sample or associated residues cannot be returned to RESL). If your laboratory cannot receive the MAPEP-01-S8 sample, or if there are any questions, please call Guy Marlette at (208) 526-2532, FAX a message to (208) 526-2548 or e-mail MARLETGM@INEL.GOV by June 15, 2001.

Thank you for your participation.

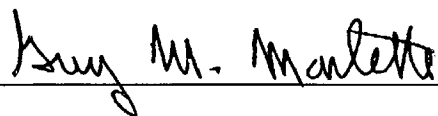
Enclosures

MAY 22 2001

U.S. Department of Energy
Mixed Analyte Performance Evaluation Program

**THIS CERTIFIES THAT
NRC REGION III LABORATORY**

PARTICIPATED IN THE MAPEP-00-W8 TEST SESSION. MAPEP IS ADMINISTERED BY THE RADIOLOGICAL AND ENVIRONMENTAL SCIENCES LABORATORY (RESL). RESL SERVES AS A REFERENCE LABORATORY FOR THE OFFICE OF ENVIRONMENTAL MANAGEMENT AND IS DIRECTLY TRACEABLE TO THE NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY (NIST) IN THE MEASUREMENT AND PREPARATION OF MATERIAL CONTAINING KNOWN CONCENTRATIONS OF RADIOACTIVE NUCLIDES. MAPEP IS ACCORDANT WITH THE NIST RADIOLOGICAL TRACEABILITY PROGRAM AND OTHER NIST PROGRAMS DESIGNED FOR THE MEASUREMENT OF STABLE INORGANIC AND ORGANIC CONSTITUENTS. THE PERFORMANCE EVALUATION REPORT FOR THE ABOVE LABORATORY SHOULD BE POSTED AND REVIEWED IN CONJUNCTION WITH THIS CERTIFICATE. THE PERFORMANCE EVALUATION REPORT CAN ALSO BE FOUND AT:
[HTTP://WWW.INEL.GOV/RESL/MAPEP](http://www.inel.gov/resl/mapep).



MAY 15. 2001

GUY M. MARLETTE
MAPEP COORDINATOR, RESL

Mixed Analyte Performance Evaluation Program

Statistical Summary

Sample ID: MAPEP-00-W8

Analyte	T(1)	A(2)	Grand Mean	Std. Dev.	Reference Value	Analyte Text	Acceptance Limits	Units
Antimony	41	41	0.47	0.03	0.476		0.33 - 0.62	(mg/L)
Arsenic	37	37	0.09	0.01	0.095		0.07 - 0.12	(mg/L)
Barium	22	22	0.00	0.00		Not Added		(mg/L)
Beryllium	40	40	0.28	0.01	0.286		0.20 - 0.37	(mg/L)
Cadmium	44	42	0.37	0.02	0.381		0.27 - 0.50	(mg/L)
Chromium	44	43	0.56	0.03	0.571		0.40 - 0.74	(mg/L)
Copper	41	41	1.22	0.05	1.238		0.87 - 1.61	(mg/L)
Lead	41	40	1.03	0.04	1.048		0.73 - 1.36	(mg/L)
Nickel	42	42	0.57	0.03	0.571		0.40 - 0.74	(mg/L)
Selenium	42	38	0.13	0.01	0.143		0.10 - 0.19	(mg/L)
Silver	40	27	0.17	0.02	0.157		0.11 - 0.20	(mg/L)
Thallium	20	20	5.39	12.54		Not Added		(mg/L)
Uranium-Total	4		6.29	0.84	0.0826		5.27 - 9.79	(mg/L)
Uranium-234	1	1			4.54E-06			
Uranium-238	2	2			0.082		5.24 - 9.72	(mg/L)
Vanadium	40	40	5.65	0.36	5.714		4.00 - 7.43	(mg/L)
Zinc	42	41	1.11	0.06	1.143		0.80 - 1.49	(mg/L)
Americium-241	34	31	1.06	0.08	1.06		0.74 - 1.38	(Bq/L)
Cesium-134	51	49	259.70	21.12	283		198.10 - 367.90	(Bq/L)
Cesium-137	52	51	91.07	4.52	94.4		66.08 - 122.72	(Bq/L)
Cobalt-57	51	49	94.57	6.25	95.5		66.85 - 124.15	(Bq/L)
Cobalt-60	48	39	2.40	0.20	2.19	Sensitivity Eval.	1.53 - 2.85	(Bq/L)
Iron-55	7	6	106.03	16.84	127		88.90 - 165.10	(Bq/L)
Manganese-54	46	44	3.07	0.29	2.87	Sensitivity Eval.	2.01 - 3.73	(Bq/L)
Nickel-63	11	9	121.97	12.91	120		84.00 - 156.00	(Bq/L)
Plutonium-238	38	36	2.25	0.22	2.12		1.48 - 2.76	(Bq/L)
Plutonium-239/240	38	37	1.96	0.22	1.86		1.30 - 2.42	(Bq/L)
Strontium-90	29	17	2.62	10.62		False Positive		(Bq/L)
Uranium-234/233	42	42	1.00	0.08	0.99		0.69 - 1.29	(Bq/L)
Uranium-235	4		4.18	2.28				(Bq/L)
Uranium-238	42	41	1.02	0.07	1.02		0.71 - 1.33	(Bq/L)
Zinc-65	46	45	4.95	0.48	4.59	Sensitivity Eval.	3.21 - 5.97	(Bq/L)
1,3-Dichlorobenzene	21	21	34.02	11.19	34		0.47 - 67.56	(ug/L)
1,4-Dichlorobenzene	22	22	24.55	8.32	24.6		QL - 49.51	(ug/L)

Note:

Outliers are excluded from the statistical summary.

Outliers are defined as laboratory data with a bias greater than 30 percent.

(1) T = Total Number of Laboratories Reporting Analyte.

(2) A = Number of Laboratories with 'Acceptable' Performance.

1. For organic components with absolute value of Z-score < 3

2. Acceptance range minimum labeled as "DL" means from the Detection Limit to the upper range.

Analyte	T(1)	A(2)	Grand Mean	Std. Dev.	Reference Value	Analyte Text	Acceptance Limits	Units
Nitrobenzene	22	21	27.60	5.48	27.6		11.16 - 44.04	(ug/L)
2,4-Dimethylphenol	23	23	35.55	8.39	35.6		10.40 - 60.70	(ug/L)
1,2,4-Trichlorobenzene	22	22	23.05	6.98	23.1		2.12 - 43.99	(ug/L)
Naphthalene	23	23	33.87	9.08	33.9		6.63 - 61.10	(ug/L)
2,6-Dichlorophenol	13	12	50.20	4.85	50.2		35.65 - 64.75	(ug/L)
2-Nitroaniline	21	21	93.81	14.30	93.8		50.94 - 136.69	(ug/L)
2,6-Dinitrotoluene	22	22	88.89	13.67	88.9		47.89 - 129.89	(ug/L)
2,4-Dinitrotoluene	23	23	45.23	7.44	45.2		22.92 - 67.55	(ug/L)
4-Nitrophenol	20	19	51.05	25.26	51.1		QL - 126.80	(ug/L)
Diethylphthalate	22	22	37.49	8.29	37.5		12.63 - 62.34	(ug/L)
Anthracene	24	24	36.21	10.88	36.2		3.59 - 68.84	(ug/L)
1,3-Dinitrobenzene	8	8	50.54	6.64	50.5		30.61 - 70.46	(ug/L)
Pentachloronitrobenzene	7				42.4			(ug/L)
Di-n-butylphthalate	5							
Pyrene	23	23	25.09	7.86	25.1		1.53 - 48.66	(ug/L)
Benzo(a)anthracene	22	22	21.78	8.19	21.8		QL - 46.35	(ug/L)

Note:

Outliers are excluded from the statistical summary.
Outliers are defined as laboratory data with a bias greater than 30 percent.
(1) T = Total Number of Laboratories Reporting Analyte.
(2) A = Number of Laboratories with 'Acceptable' Performance.
1. For organic components with absolute value of Z-score < 3
2. Acceptance range minimum labeled as "DL" means from the Detection Limit to the upper range.

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID:

NRCQ02

NRC Region III Laboratory

801 Warrenville Road

Lisle

IL

60532

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Antimony	NR	0.476				0.33 - 0.62			
Arsenic	NR	0.095				0.07 - 0.12			
Beryllium	NR	0.286				0.20 - 0.37			
Cadmium	NR	0.381				0.27 - 0.50			
Chromium	NR	0.571				0.40 - 0.74			
Copper	NR	1.238				0.87 - 1.61			
Lead	NR	1.048				0.73 - 1.36			
Nickel	NR	0.571				0.40 - 0.74			
Selenium	NR	0.143				0.10 - 0.19			
Silver	NR	0.157				0.11 - 0.20			
Vanadium	NR	5.714				4.00 - 7.43			
Zinc	NR	1.143				0.80 - 1.49			
Americium-241	NR	1.06				0.74 - 1.38			
Cesium-134	315.1	283	A		11.3	198.10 - 367.90	9.2	L	(Bq/L)
Cesium-137	96.6	94.4	A		2.3	66.08 - 122.72	3.2		(Bq/L)
Cobalt-57	101.8	95.5	A		6.6	66.85 - 124.15	3.5		(Bq/L)
Cobalt-60	2.7	2.19	A		23.3	1.53 - 2.85	0.3		(Bq/L)
Iron-55	NR	127				88.90 - 165.10			
Manganese-54	3.6	2.87	A		25.4	2.01 - 3.73	0.44		(Bq/L)
Nickel-63	NR	120				84.00 - 156.00			
Plutonium-238	NR	2.12				1.48 - 2.76			
Plutonium-239/240	NR	1.86				1.30 - 2.42			
Uranium-234/233	NR	0.99				0.69 - 1.29			
Uranium-238	NR	1.02				0.71 - 1.33			
Zinc-65	4.7	4.59	A		2.4	3.21 - 5.97	0.6		(Bq/L)

Flags:

A = Result acceptable

Bias <= 20%

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

N = Result not acceptable

Bias > 30%

L = Uncertainty potentially too low (for information purposes only)

H = Uncertainty potentially too high (for information purposes only)

QL = Detection Limit

RW = Report Warning

NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID:

NRCQ02

NRC Region III Laboratory

801 Warrenville Road

Lisle

IL

60532

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
1,3-Dichlorobenzene	NR	34				0.47 - 67.56	
1,4-Dichlorobenzene	NR	24.6				QL - 49.51	
Nitrobenzene	NR	27.6				11.16 - 44.04	
2,4-Dimethylphenol	NR	35.6				10.40 - 60.70	
1,2,4-Trichlorobenzene	NR	23.1				2.12 - 43.99	
Naphthalene	NR	33.9				6.63 - 61.10	
2,6-Dichlorophenol	NR	50.2				35.65 - 64.75	
2-Nitroaniline	NR	93.8				50.94 - 136.69	
2,6-Dinitrotoluene	NR	88.9				47.89 - 129.89	
2,4-Dinitrotoluene	NR	45.2				22.92 - 67.55	
4-Nitrophenol	NR	51.1				QL - 126.80	
Diethylphthalate	NR	37.5				12.63 - 62.34	
Anthracene	NR	36.2				3.59 - 68.84	
1,3-Dinitrobenzene	NR	50.5				30.61 - 70.46	
Pentachloronitrobenzene	NR	42.4					
Pyrene	NR	25.1				1.53 - 48.66	
Benzo(a)anthracene	NR	21.8				QL - 46.35	

Flags:

A = Result acceptable

Z-score ≤ 2.0)

W = Result acceptable with warning

$2.0 < \text{Z-score} \leq 3.0$)

N = Result not acceptable

Z-score > 3.0)

L = Uncertainty potentially too low (for information purposes only)

H = Uncertainty potentially too high (for information purposes only)

QL = Detection Limit

RW = Report Warning

NR = Not Reported

Mixed Analyte Performance Evaluation Program

Historical Performance Data - Radiological Inorganic

Target Analytes

NRCQ02

NRC Region III Laboratory

Target Analyte	98-W6	99-W7	00-W8	98-S5	99-S6	00-S7
Americium-241				PNR		
Cesium-134			+A			
Cesium-137	+A	A	A	PNR	A	A
Cobalt-57	-A	A	A	PNR	A	A
Cobalt-60	A	A	+A	PNR	A	A
Iron-55				PNR		
Manganese-54	+A	+A	+A	PNR	A	A
Nickel-63				PNR		
Plutonium-238				PNR		
Plutonium-239/240				PNR		
Potassium-40				PNR		
Strontium-90				PNR		
Uranium-234/233				PNR		
Uranium-238				PNR		
Zinc-65	+A	+A	A	PNR	A	A

Flags:

- A = Result acceptable (Bias <=10%)
- +/-A = Result acceptable (10% < Bias <= 20%)
- +/-W = Result acceptable with warning (20% < Bias <= 30%)
- +/-N = Result Not Acceptable (Bias > 30%)
- RW = Report Warning
- Blank = target analyte not included in study

- = Result was reported with negative bias
- + = Result was reported with positive bias
- PNR = Requested and received sample, but did not report results

MAPEP-01-S8 SAMPLE DESCRIPTION

The analytes for the MAPEP-01-S8 soil, and their concentration ranges are listed in the following tables. Each participant will receive a single sample containing approximately 300 grams of soil.

RADIOLOGICAL CONSTITUENT DESCRIPTION

Analyte	Concentration Range	Analyte	Concentration Range
⁵⁷ Co, ¹³⁴ Cs, ¹³⁷ Cs, ⁵⁴ Mn, ⁶⁵ Zn, ⁶⁰ Co, ⁴⁰ K	< 4000 Bq/kg	⁵⁵ Fe, ⁶³ Ni	<2000 Bq/kg
⁹⁰ Sr	< 1000 Bq/kg	²⁴¹ Am, ²³⁸ Pu, ²³⁹ Pu ²³⁴ U, ²³⁸ U	< 300 Bq/kg

NOTE: The ²³⁴U and ²³⁸U isotopes may NOT be in equilibrium. Some of the radionuclides listed on the sample description may not be detected. The reference date for the radionuclides is January 1, 2001, 12:00 MST.

STABLE INORGANIC CONSTITUENT DESCRIPTION

Analyte	Concentration Range	Analyte	Concentration Range
Ag, As, Be, Cr(Total), Tl, Pb, Ni, V, Zn	10 - 400 mg/kg	Ba	100 - 1000 mg/kg
Cd, Se	5 - 50 mg/kg		

NOTE: Not all the stable inorganic constituents listed in the table above are present. Laboratories should only report those constituents that are quantitated ABOVE the minimum concentration range listed for that analyte.

MAPEP-01-S8 SAMPLE DESCRIPTION

SEMI-VOLATILE ORGANIC SAMPLE DESCRIPTION

Sample holding time is based upon the date of **RECEIPT** of the sample by the participating laboratory.

Analyte Class	Concentration Range	Analyte Class	Concentration Range
Phthalate Esters	< 1200 ug/Kg	Polynuclear Aromatics	< 1000 ug/Kg
Phenols	< 1000 ug/Kg	Nitroaromatics	< 1000 ug/Kg
Chlorinated Hydrocarbons	< 1000 ug/Kg	ug = micrograms Kg = kilograms	

"MAPEP samples are analytical standards or a "product" generated for the purpose of securing and evaluating analytical services; they are not hazardous waste and they are not samples of hazardous waste... Thus, a laboratory participating in the MAPEP is in the process of establishing its eligibility and credentials to do DOE analytical work. It follows, therefore, that the laboratory is the "generator" of the waste resulting when the samples and the resulting residues are to be discarded." (MEMORANDUM OCC-95-189, Office of Chief Counsel, October 16, 1995)

Last updated: May 2, 2000