

eberline

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April 21, 1978

EI-916124

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Mr. Dick Gilbert  
Battelle Northwest  
P. O. Box 999  
Richland, Washington 99352

Dear Mr. Gilbert:

Enclosed herewith is a copy of Quality Control Procedure regarding the Enewetak CleanUp Project. Also enclosed is a copy of the Quality Assurance Audit, Enewetak CleanUp.

If you require anything further, please contact us.

Sincerely,

*Michael Ortiz*  
MICHAEL A. ORTIZ  
Laboratory Manager

MAO/jm

Encls.

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REPOSITORY PNNL  
COLLECTION Marshall Islands  
BOX No. 5685  
FOLDER Enewetak April 1978

TABLE 1. Duplicate analyses (two 5-gram aliquots) from Enewetak Atoll soil field samples.<sup>++</sup>

	Month	Analysis 1	Analysis 2	Percent Relative Variability <sup>+</sup> (%)		
<sup>239</sup> Pu	Sept.	pCi/g	pCi/g			
		3.1	3.4	6.5		
		4.5	4.7	3.1		
		12	14	10.9		
	Oct.	21.6	28.8	20.2		
		5.1	6.1	12.6		
		6.0	6.0	0.0		
		11.7	8.9	27.2		
		12.7	13.0	1.6		
		17.9	18.2	1.2		
		19.4	21.6	7.6		
		21.1	21.8	2.3		
	March and April	0.58	0.62	4.7		
		0.62	0.73	11.5		
		2.35	1.97	12.4		
		16.86	13.39	16.2		
		22.95	31.42	22.0		
		29.56	27.15	6.0		
		38.23	36.82	2.7		
		119.2	116.2	1.8		
				Median = 6.0%		
				Range: 0.0 to 27.2%		
<sup>238</sup> Pu	March and April	0.01	0.02	47.1		
		0.03	0.05	35.4		
		0.20	0.18	7.4		
		1.89	1.57	13.1		
		2.66	1.96	21.4		
		4.00	3.53	8.8		
		4.09	4.07	0.3		
		6.66	8.82	19.7		
						Median = 16.4%
						Range: 0.3 to 47.1%

<sup>+</sup>100(s/ $\bar{x}$ )

<sup>++</sup>From Eberline Quality Assurance Reports for September 1977 through April 1978 transmitted to R. O. Gilbert in letters from Mike Ortiz (Eberline) dated April 21 and May 15, 1978.

TABLE 2. Duplicate analyses (two 5-gram aliquots) from Enewetak Atoll soil field samples. ++

	Month	Analysis 1	Analysis 2	Percent Relative Variability <sup>+</sup> (%)
Gamma 241 Am		pCi/g	pCi/g	
	Sept.	1.1	1.1	0.0
		1.6	1.2	15.7
		9.2	8.1	9.0
		13	13	0.0
		33	30	6.7
		35	30	10.9
		44	40	6.7
	Oct.	3.0	3.0	0.0
		3.1	2.8	7.2
		3.3	3.5	4.2
		8.6	8.7	0.8
	March and April	<MDA	0.25	-
		<MDA	<MDA	-
		1.72	1.77	2.0
		5.46	5.35	1.4
		14.25	15.45	<u>5.7</u>
			Median = 4.9%	
			Range: 0.0 to 15.7%	
Chemistry 241 Am	Oct.	3.3	2.4	22.3
		6.5	7.7	12.0
		15.2	15.6	<u>1.8</u>
			Median = 12.0%	
Gross Alpha	Oct.	5	25	94.3
		10	21	50.2
		16	28	38.6
		34	16	<u>50.9</u>
			Median = 50.5%	
Beta	Oct.	24	32	20.2
		72	62	10.6
		137	132	2.6
		345	363	<u>3.6</u>
			Median = 7.1%	

<sup>+</sup>100(s/ $\bar{x}$ )

++ From Eberline Quality Assurance Reports for September 1977 through April 1978 transmitted to R. O. Gilbert in letters from Mike Ortiz (Eberline) dated April 21 and May 15, 1978.

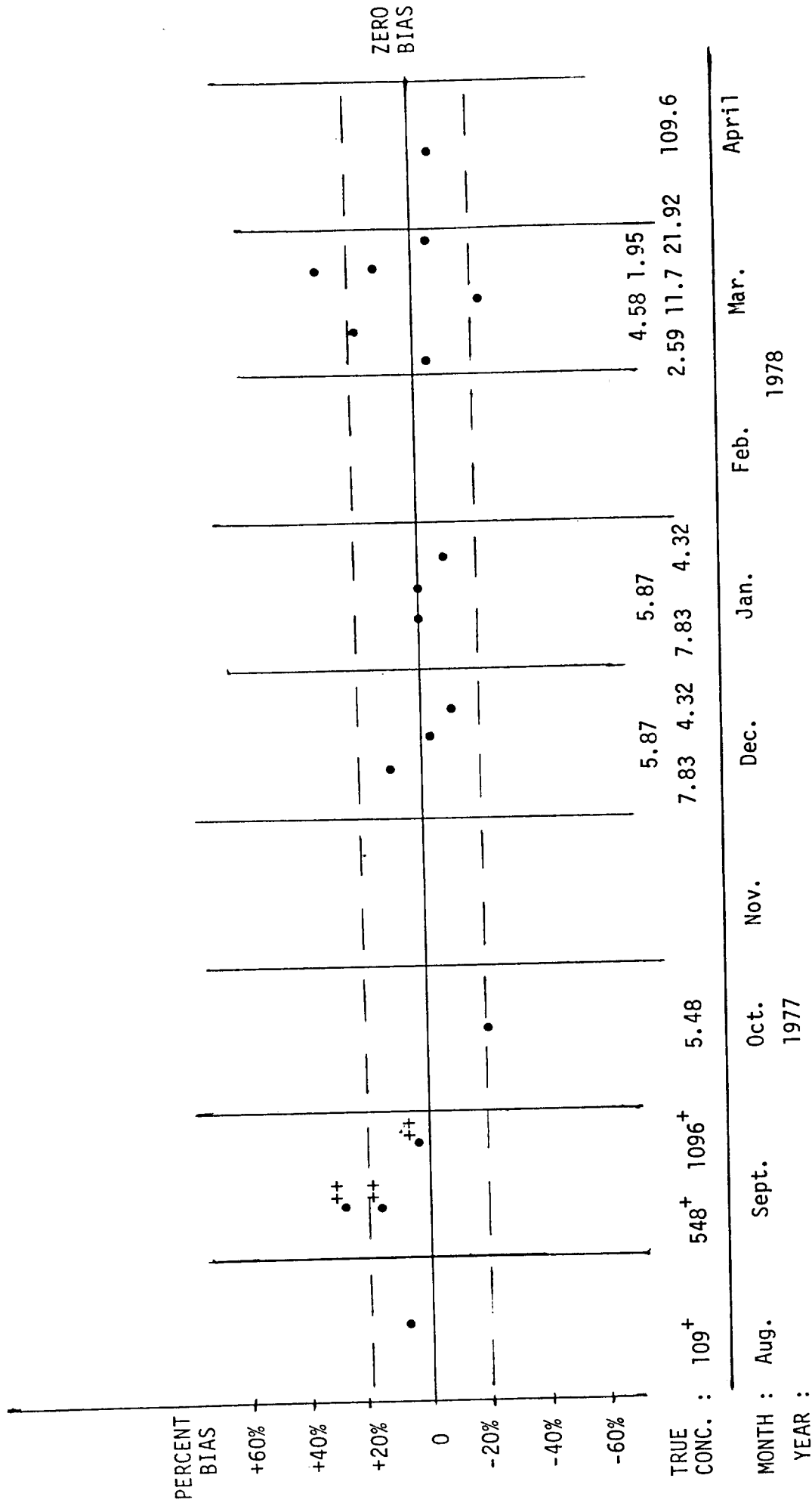
TABLE 3. Analyses on blank soil samples taken from Enewetak Island.<sup>+</sup>

	Month	Amount of Spike Added	Observed (pCi/g) ± Counting Error (2σ)	
<sup>239</sup> Pu	Oct.	0.0	0.08 ± 36%	
		0.0	0.04 ± 42%	
		0.0	0.15 ± 25%	
	Nov.	0.0	0.04	
		0.0	0.28 ± 25%	
	March	0.0	0.25 ± 25%	
		0.0	0.11 ± 32%	
		0.0	0.24 ± 26%	
		0.0	0.65 ± 46%	
	April	0.0	0.05 ± 45%	
				Median = 0.13
				Range: 0.04 to 0.65 pCi/g
	<sup>238</sup> Pu	March	0.0	0.02 ± 52%
0.0			0.04 ± 58%	
0.0			0.02 ± 71%	
0.0			0.03 ± 67%	
April		0.0	0.03 ± 61%	
Gamma <sup>241</sup> Am	Oct.	0.0	<0.10	
		0.0	0.08 ± 131%	
		0.0	0.15 ± 213%	
	Nov.	0.0	<0.10	
	March	0.0	<MDA	
		0.0	<MDA	
		0.0	<MDA	
Chemistry <sup>241</sup> Am	Oct.	0.0	0.04 ± 100%	
		0.0	0.02 ± 200%	
	March	0.0	0.53 ± 82%	
		0.0	0.03 ± 100%	
		0.0	0.04 ± 115%	
	April	0.0	0.07 ± 67%	

<sup>+</sup> From Eberline Quality Assurance Reports for September 1977 through April 1978 as transmitted to R. O. Gilbert in letters from Mike Ortiz (Eberline) dated April 21 and May 15, 1978.



PERCENT DEVIATION FROM  $^{241}\text{Am}$  SPIKED SOIL SAMPLES. WET  
 CHEMISTRY ANALYSIS BY EBERLINE ENEWETAK LABORATORY.



<sup>+</sup> pCi Total. All other values are pCi/g dry (Enewetak Island) soil.

<sup>++</sup> Sample not ball-milled.

