

PACIFIC NORTHWEST LABORATORIES  
RICHLAND, WA 99352

1830 MATERIAL

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1831 MATERIAL

XEROX 200 TELECOPIER COMMERICAL  
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TO: DR BRUCE WACHHOLZ  
COMPANY: DEPARTMENT OF ENERGY  
CITY, STATE: GERMANTOWN, MD

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COMMERICAL  
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VERIFICATION NO. \_\_\_\_\_  
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FROM: DR W J BAIR  
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September 10, 1982

MF

CALCULATION OF POTENTIAL RADIATION CAUSED HEALTH EFFECTS  
FOR PERSONS LIVING IN THE NORTHERN MARSHALL ISLANDS

Potential health effects for persons living in the northern Marshall Islands are calculated using the same assumptions and same methods used for the Bikini population (copy attached). Risk coefficients from both BEIR I and BEIR III were used providing not only a range of estimates but also a comparison of the most conservative (linear, relative risk model) with what would be described by many radiation biologists as the most probable (linear-quadratic, absolute model).

POPULATION ESTIMATES

The following population estimates are derived by simple ratios from the Bikini calculation (copy attached) for a population of 550. These calculations predicted 1277 births, 164 deaths over a period of 30 years and a final population of 1684 after 30 years for an initial population of 550.

$$\text{Deaths in 30 years: } \frac{164}{550} = \frac{\text{deaths in population of interest}}{\text{initial population of interest}}$$

$$\text{Births in 30 years: } \frac{1277}{550} = \frac{\text{births in population of interest}}{\text{initial population of interest}}$$

$$\text{-Population after 30 years: } \frac{1684}{550} = \frac{\text{population after 30 years}}{\text{initial population of interest}}$$

Also from the Bikini population, the estimate of the full 30 year dose received by children born during the 30 year period is 0.36 of the dose persons living the entire 30 year period would receive.

cancer--Minimum: Absolute lifetime risk of cancer for continuous exposure,  $67 \times 10^{-6} \text{ rad}^{-1}$  (low LET) based on linear quadratic model.

Maximum: Relative lifetime risk of cancer for continuous exposure,  $430 \times 10^{-6} \text{ rad}^{-1}$ , based on linear model.

Genetic Effects--Minimum:  $\frac{5}{75} \times 10^{-6}$  increase per rem in first generation.

Maximum:  $\frac{75}{5.0} \times 10^{-6}$  increase per rem in first generation.

OCTOBER

Rongelap (R)

Likiep (L)

Mejit [32]

Utrik (Utr)

Ujelang [6]

Ailuk (Ail)

Wocho (Wot)

Taka (Taka)

Jemo [16]

Bikar [69]

Rongerik (R)

Ailinginae (A)

\* Highest Number [ ] Maximum

CANCER RISK

OCTOBER 31, 1982

8	9		10	11	12	13	14
	BEIR-I Absolute (Col. 7 x 87 x 10 <sup>-6</sup> rem <sup>-1</sup> )	BEIR-I Relative (Col. 7 x 458 x 10 <sup>-6</sup> rem <sup>-1</sup> )					
	0.647 (0.6)		0.095 (0.1)		69.5	10	
	0.238 (0.2)		0.0348 (0.03)		145	22 (20)	
	0.201 (0.2)		0.0294 (0.03)		98	15	
	0.162 (0.2)		0.0237 (0.02)		97.8	15	
	0.0123 (0.01)		0.0018 (0.002)		30	4.5 (5)	
	0.240 (0.2)		0.035 (0.04)		125	19 (20)	
	0.0147 (0.01)		0.0022 (0.002)		22.7	3	
	0.0143 (0.01)		0.0021 (0.002)		30	4.5 (5)	
	0.0327 (0.03)		0.0048 (0.005)		30	4.5 (5)	
	0.152 (0.2)		0.022 (0.02)		30	4.5 (5)	
	0.177 (0.2)		0.0258 (0.03)		30	4.5 (5)	
	0.177 (0.2)		0.0258 (0.03)		30	4.5 (5)	

GENETIC EFFECTS

OCTOBER 31, 1982

	1	2	3	4	5	6	7
	Initial Population	Number of Births in 30 Years	Number of Spontaneous Birth Defects in 30 Years (10.7%)	30-Year Whole Body Dose (rem)*	Total Percent Increase (0.2% / rem)	Number of Increased Birth Defects (Col. 5 x Col. 3)	Percent Increase (Col. 6 + Col. 7) x 100
AtoII						BEIR-I	
Rongelap (Rongelap)	233	541	58 (60)	2.500	.5	.29	
Likiep (Likiep)	487	1130	120.9 (120)	0.530	.106	.128	
Mejit	329	764	81.7 (80)	0.710	.142	.116	
Utrik (Utrik)	328	762	81.5 (80)	0.490	.098	.08	
Ujelang	100	230	25	0.130	.026	.0065	
Ailuk (Ailuk)	420	975	104.3 (100)	0.650	.13	.136	
Wotho (Wotho)	76	177	18.9 (20)	0.200	.04	.0076	
Taka (Taka)	100	230	25	0.140	.028	.007	
Jemo	100	230	25	0.330	.066	.0165	
Bikar	100	230	25	0.520	.104	.026	
Rongerik	100	230	25	1.800	.36	.09	
Ailinginae (Knox)	100	230	25	1.700	.36	.09	

\* Highest dose values were used. These were based on BNL Community A & B Surveys.  
 ( ) Numbers used in book.

OCTOBER 31, 1982

8	9	BEIR-III Minimum Number of Increased Effects (Column 8 x 5 x 10 <sup>-6</sup> per rem)	Maxin Inctr (Col 10 <sup>-6</sup>
1352.5	0.0068 (0.007)	598.9	0.003
542.44	0.0027 (0.003)	373.4	0.0019 (0.002)
29.9	0.00015 (0.0002)	633.75	0.0032 (0.003)
35.4	0.00018 (0.0002)	32.2	0.00016 (0.0002)
75.9	0.00038 (0.0004)	119.6	0.0006
414.	0.0021 (0.002)	391.	0.00196 (0.002)

*data in purple -  
Called to me by Bill Robison Oct 30, 1982*

**DRAFT**

Table 21. Maximum annual wholebody and bone marrow doses in mrem/y for alternate diets.

Atoll/Island	MLSC		BNL				BNL	
	Ujelang		Community B				Community A	
	<u>Diet Survey</u>		<u>Diet Survey</u>				<u>Diet Survey</u>	
	Whole body	Bone marrow	Whole body	Bone marrow	Whole body	Bone marrow	Whole body	Bone marrow
<b>Likiep</b>								
Rikuraru	3.4 ✓	3.6 ✓					16 14	17 15
Likiep	5.2 ✓	5.4 ✓					25 23	26 <u>25</u>
Agony	3.7 ✓	4 ✓					20 18	21 20
Kapenor	3.1 3.2	3.4 ✓					14 13	15 14
<b>Taka</b>								
Taka	4.8 ✓	5.1 5.3	6.2 6.1	7.7 <u>7.0</u>				
Eiluk	4.1 3.6	4.5 4.0	4.9 3.8	7.4 4.3				
<b>Jemo</b>								
Jemo	4.3 4.2	4.7 4.5					19 14	21 <u>16</u>
<b>Bikar</b>								
Jaboerukku	6.1 ✓	8.8 10					19 ✓	<sup>90</sup> 32 - high 57 <u>69</u>
Bikar	6 ✓	6.4 6.6					23 ✓	28 30
<b>Rongerik</b>								
Rongerik	60 ✓	66 ✓	81 ✓	151 <u>90</u>				
Eniwetak	42 ✓	44 45	69 ✓	89 73				
<b>Mejit</b>								
Mejit	5.8 5.9	5.9 6.0					31 ✓	<u>32</u> ✓
<b>Rongelap</b>								
Naen	330 325	350 330	505 490	796 580				
Kabelle	130 ✓	140 ✓	<del>196</del> 200	300 ✓				
Mellu	92 91	97 ✓	212 200	284 270				
Eniaetok	95 ✓	96 100	154 150	172 220				
Rongelap	56 ✓	58 ✓	112 110	138 <u>135</u>				
Arbar	34 35	37 39	57 55	89 90				



Table 21. (Continued)

Atoll/Island	MLSC		BNL				BNL	
	Ujelang		Community B				Community A	
	Diet Survey		Diet Survey				Diet Survey	
	Whole body	Bone marrow	Whole body	Bone marrow	Whole body	Bone marrow	Whole body	Bone marrow
Utirik								
Utirik	11	18 ✓	12	✓	23	22	27	24
Aon	15	✓	16	✓	30	29	30	31
Ujelang								
Ujelang	3.2	3.3	3.4	3.5	5.6	5.7	6.2	6.2
Wotho								
Medyeron	2.4	✓	2.6	2.7			10	✓
Wotho	2.5	✓	2.7	✓			8.6	✓
Kabben	2.5	✓	2.7	✓			7.7	✓
Ailinginae								
Knox	25	✓	25	27	77	76	78	87
Nechuwanen	22	✓	23	24	45	44	49	54
Mogiri	24	✓	25	26	45	44	61	58
Sifo	13	✓	14	✓	20	✓	29	25
Ailuk								
Kapen	4.6	4.7	26	4.8			23	22
Enijabro	3.9	✓	4.0	4.1			21	20
Enejelar	4.1	✓	4.2	✓			25	24
Bigen	5.9	✓	9.7	6.1			29	29
Aliet	3.9	✓	4.1	✓			28	27
Berejao	4.1	✓	4.2	4.3			35	34
Ailuk	4.7	✓	4.8	4.9			29	✓
Agulne	4.8	4.5	4.6	4.7			24	✓

Data in Purple - Called on to me by  
 Bill Calverton, Oct 30, 1982

DRAFT

Table 22. The 30-y integral wholebody and bone marrow dose in rem for alternate diets.

Atoll/Island	MLSC		BNL		BNL	
	Ujelang		Community B		Community A	
	<u>Diet Survey</u>		<u>Diet Survey</u>		<u>Diet Survey</u>	
	Whole body	Bone marrow	Whole body	Bone marrow	Whole body	Bone marrow
<b>Likiep</b>						
✓ Rikuraru Is. <i>Is.</i>	0.077 ✓	0.084 ✓			0.36, 33	0.4, 36
✓ Likiep Is. <i>Is.</i>	0.12 ✓	0.12, 13			(0.56), (0.53)	0.60, (0.58)
: Agony <i>Not Is.</i>	0.084, 0.85	0.097 <sup>4</sup>			0.45, 41	0.5, 47
: Kapenor	0.072	0.079			0.31	0.36
<i>(C) Taka</i> <i>unmarked</i>		0.080			0.28	0.34
Taka	0.11 ✓	0.12, 13	(0.14) ✓	0.19, (0.17)		
Eluk	0.093, 0.82	0.11, 0.96	0.11, 0.85	0.19, 11		
Jemo <i>marked by</i>						
Jemo	0.096	0.11 ✓			(0.44), (0.33)	0.50, (0.39)
<i>(C) Bikar</i> <i>marked</i>						
Jaboerukku	0.14 ✓	0.22, 26			(0.44) ✓	1.5, (1.8)
Bikar	0.14 ✓	0.15, 16			(0.52) ✓	0.69, 73
<i>(E) Rongerik</i> <i>marked</i>						
Rongerik	1.3 ✓	1.6 ✓	(1.8) ✓	3.8, (2.1)		
Eniwetak	0.94 ✓	1.0 ✓	1.5 ✓	2.2, 1.7		
<b>Mejit</b>						
✓ Mejit	0.13 ✓	0.14 ✓			(0.71) ✓	(0.73) ✓
<b>Rongelap</b>						
Naen <i>to be in all</i>	7.1 ✓	7.9, 7.4	(11) ✓	20, 14		
Kabelle <i>marked</i>	2.9 ✓	3.3 ✓	4.4 ✓	7.6, 7.7		
Mellu <i>marked</i>	2.0 ✓	2.2 ✓	4.8, 4.7	7.0, 6.8		
: Eniaetok	2.1 ✓	2.2, 2.3	3.5, 3.4	4.1, 5.5		
✓ Rongelap	1.3 ✓	1.3, 1.4	(2.5) ✓	3.4, (3.3)		
: Arbar	0.75, 76	0.86, 92	1.3, 1.2	2.2, 2.3		

Table 22. (Continued).

Atoll/Island	MLSC		BNL		BNL	
	Ujelang		Community B		Community A	
	<u>Diet Survey</u>		<u>Diet Survey</u>		<u>Diet Survey</u>	
	Whole body	Bone marrow	Whole body	Bone marrow	Whole body	Bone marrow
Utirik						
✓ Utirik	0.25 ✓	0.28 .27	0.53 .49	0.68 .59		
? Aon	0.35 ✓	0.39 .37	0.68 .65	0.72 ✓		
Ujelang						
✓ Ujelang	0.073 .075	0.081 .082	0.13 ✓	0.15 ✓		
Wotho						
: Medjeron	0.054 .055	0.063 .065			0.24 ✓	0.33 ✓
✓ Wotho	0.057 .057	0.062 .063			0.2 ✓	0.23 ✓
: Kabben	0.056 .057	0.063 .065			0.18 ✓	0.20 .21
(F) Ailinginae <i>unsubstantiated</i>						
Knox <i>(Visited by people from Rongelap)</i>	0.57 .56	0.57 .64	1.8 .1.7	1.8 .2.1		
Uechuwarren	0.5 ✓	0.53 .58	1.0 ✓	1.2 1.3		
Mogiri	0.53 ✓	0.58 .61	1.0 ✓	1.5 1.4		
Sifo	0.28 ✓	0.32 ✓	0.45 ✓	0.73 .62		
Ailuk						
: Kapen	0.11 ✓	0.30 .11			0.52 .50	2.5 .52
: Enijabro	0.088 .089	0.094 .094			0.48 .46	0.5 .48
: Enejelar	0.092 ✓	0.098			0.56 .54	0.58 .56
✓ Bigen	0.13 ✓	0.20 .14			0.66 .65	1.3 .67
: Aliet	0.088 ✓	0.094 .095			0.63 .61	0.66 .64
: Berejao	0.092 ✓	0.098 .099			0.79 .77	0.82 .80
✓ Ailuk	0.10 .11	0.11 .11			0.66 .65	0.69 .68
: Agulne	0.10 ✓	0.11 ✓			0.55 .54	0.57 ✓

SUMMARY DATA - BOOK FOR NORTHERN MARSHALLS, OCTOBER 31, 1982

Atoll (1980) Population	Highest Dose to Individual in 1 Year (mrem)	30 Year Whole Body Dose (mrem)	30 Year Bone Marrow Dose (mrem)	30 Year Excess Cancers	30 Year Excess Birth Defects
Ujelang (100)	A. 6.2 x 3 ≈ 20 B. 6.2 x 3 = 18.6 (20)	130 130	150 150	0.002 - 0.01 0.002 - 0.01	0.0002-0.002 0.0002-0.002
Wotho (76)	A. 9.6 x 3 ≈ 30 B. 10 x 3 = 30	200 200	230 230	0.002 - 0.01 0.002 - 0.01	0.0002-0.003 0.0002-0.003
Ailinginae (100*)	A. 78 x 3 ≈ 230 B. 87 x 3 = 261 (270) (70)	1800 1000 7	1800 2100	0.02 - 0.2 0.03 - 0.2	0.002 - 0.03 0.002 - 0.03
Rongelap (233)	A. 138 x 3 ≈ 400 B. 135 x 3 = 405 (400)	2500 2500	3400 3300	0.1 - 0.7 0.1 - 0.6	0.007 - 0.1 0.007 - 0.1
Rongerik (100*)	A. 151 x 3 ≈ 450 B. 90 x 3 = 270	1800 1800	3800 2100	0.05 - 0.3 0.03 - 0.2	0.002 - 0.03 0.002 - 0.03
Likiep (487)	A. 26 x 3 ≈ 80 B. 25 x 3 = 75	560 530	600 580	0.04 - 0.3 0.03 - 0.2	0.003 - 0.05 0.003 - 0.05
Taka (100*)	A. 7.7 x 3 ≈ 20 B. 7. x 3 = 21 (20)	140 140	190 170	0.002 - 0.02 0.002 - 0.01	0.0002-0.003 0.0002-0.002
Jemo (100*)	A. 21 x 3 ≈ 60 B. 16 x 3 = 48 (50) (15)	440 330	500 390	0.006 - 0.04 0.005 - 0.03	0.0005-0.008 0.0004-0.006
Utrik (328)	A. 27 x 3 ≈ 80 B. 24 x 3 = 72 (75) (15)	530 490	680 590	0.03 - 0.2 0.02 - 0.2	0.002 - 0.03 0.002 - 0.03
Bikar (100*)	A. 57 x 3 ≈ 170 B. 69 x 3 = 207 (210) (70)	520 520	690 1800	0.02 - 0.1 0.02 - 0.2	0.0006-0.009 0.0006-0.009
Ailuk (420)	A. 30 x 3 ≈ 90 B. 30 x 3 = 90	660 650	690 680	0.04 - 0.2 0.04 - 0.2	0.003 - 0.05 0.003 - 0.05
Mejit (329)	A. 32 x 3 ≈ 100 B. 32 x 3 = 96 (100)	700 710	730 730	0.03 - 0.2 0.03 - 0.2	0.003 - 0.04 0.003 - 0.04

\* For uninhabited islands, calculations were based on possibility of 100 people living there in the future.  
A Based on first draft dose data.

SUMMARY DATA - BOOK FOR NORTHERN MARSHALLS, OCTOBER 31, 1982

Ato11 (1980) Population	Highest Dose to Individual in 1 Year (mrem)	30 Year Whole Body Dose (mrem)	30 Year Bone Marrow Dose (mrem)	30 Year Excess Cancers	30 Year Excess Birth Defects
Ujelang (100)	A. $6.2 \times 3 \approx 20$ B. $6.2 \times 3 = 18.6$ (2%)	130 130	150 150	0.002 - 0.01 0.002 - 0.01	0.0002-0.002 0.0002-0.002
Wotho (76)	A. $9.6 \times 3 \approx 30$ B. $10 \times 3 = 30$	200 200	230 230	0.002 - 0.01 0.002 - 0.01	0.0002-0.003 0.0002-0.003
Ailinginae (100*)	A. $78 \times 3 \approx 230$ B. $87 \times 3 = 261$ (27%)	1800 1000	1800 2100	0.02 - 0.2 0.03 - 0.2	0.002 - 0.03 0.002 - 0.03
Rongelap (233)	A. $138 \times 3 \approx 400$ B. $135 \times 3 = 405$ (40%)	2500 2500	3400 3300	0.1 - 0.7 0.1 - 0.6	0.007 - 0.1 0.007 - 0.1
Rongerik (100*)	A. $151 \times 3 \approx 450$ B. $90 \times 3 = 270$	1800 1800	3800 2100	0.05 - 0.3 0.03 - 0.2	0.002 - 0.03 0.002 - 0.03
Likiep (487)	A. $26 \times 3 \approx 80$ B. $25 \times 3 = 75$	560 530	600 580	0.04 - 0.3 0.03 - 0.2	0.003 - 0.05 0.003 - 0.05
Taka (100*)	A. $7.7 \times 3 \approx 20$ B. $7 \times 3 = 21$ (2%)	140 140	190 170	0.002 - 0.02 0.002 - 0.01	0.0002-0.003 0.0002-0.002
Jemo (100*)	A. $21 \times 3 \approx 60$ B. $16 \times 3 = 48$ (5%)	440 330	500 390	0.006 - 0.04 0.005 - 0.03	0.0005-0.008 0.0004-0.006
Utrik (328)	A. $27 \times 3 \approx 80$ B. $24 \times 3 = 72$ (7%)	530 490	680 590	0.03 - 0.2 0.02 - 0.2	0.002 - 0.03 0.002 - 0.03
Bikar (100*)	A. $57 \times 3 \approx 170$ B. $69 \times 3 = 207$ (21%)	520 520	690 1800	0.02 - 0.1 0.02 - 0.2	0.0006-0.009 0.0006-0.009
Ailuk (420)	A. $30 \times 3 \approx 90$ B. $30 \times 3 = 90$	660 650	690 680	0.04 - 0.2 0.04 - 0.2	0.003 - 0.05 0.003 - 0.05
Mejit (329)	A. $32 \times 3 \approx 100$ B. $32 \times 3 = 96$ (10%)	700 710	730 730	0.03 - 0.2 0.03 - 0.2	0.003 - 0.04 0.003 - 0.04

\* For uninhabited islands, calculations were based on possibility of 100 people living there in the future.

NOVEMBER 31, 1982

CANCER RISK

Atoll	1 Initial Population	2 30-Year Bone Marrow Dose* (rem)	3 30-Year Person Rems (Col. 1 x Col. 2)	4 Number Births Ex- posed in 30 Y.
Rongelap (Rongelap) [135]	233	3.300	768.9	541
Likiep (Likiep) [25]	487	0.580	282.5	1130
Mejit [32]	329	0.730	240.2	764
Utrik (Utrik) [24 (25)]	328	0.590	193.5	762
Ujelang [6.2 (6)]	100	0.150	15	232
Ailuk (Ailuk) [30]	420	0.680	285.6	975
Wotho (Wotho) [10]	76	0.230	17.5	177
Taka (Taka) [7]	100	0.170	17	232
Jemo [16]	100	0.390	39	232
Bikar [69 (70)]	100	1.800	180	232
Rongerik (Rongerik) [90]	100	2.100	210	232
Ailinginae (Knox) [87 (90)]	100	2.100	210	232

\* Highest dose values were used. These were based on BNL Community A or B Survey.  
 ( ) Numbers used in book.  
 [ ] Maximum annual dose in millirem.

30-  
(0.3

8	9		10	11	12	13	14
	BEIR-I Absolute (Col. 7 x 87 x 10 <sup>-6</sup> rem <sup>-1</sup> )	BEIR-I Relative (Col. 7 x 458 x 10 <sup>-6</sup> rem <sup>-1</sup> )					
	0.647 (0.6)	0.238 (0.2)	0.095 (0.1)		69.5	10	
	0.238 (0.2)	0.201 (0.2)	0.0348 (0.03)		145	22 (20)	
	0.201 (0.2)	0.162 (0.2)	0.0294 (0.03)		98	15	
	0.162 (0.2)	0.0123 (0.01)	0.0237 (0.02)		97.8	15	
	0.0123 (0.01)	0.240 (0.2)	0.0018 (0.002)		30	4.5 (5)	
	0.240 (0.2)	0.0147 (0.01)	0.035 (0.04)		125	19 (20)	
	0.0147 (0.01)	0.0143 (0.01)	0.0022 (0.002)		22.7	3	
	0.0143 (0.01)	0.0327 (0.03)	0.0021 (0.002)		30	4.5 (5)	
	0.0327 (0.03)	0.152 (0.2)	0.0048 (0.005)		30	4.5 (5)	
	0.152 (0.2)	0.177 (0.2)	0.022 (0.02)		30	4.5 (5)	
	0.177 (0.2)	0.177 (0.2)	0.0258 (0.03)		30	4.5 (5)	
	0.177 (0.2)	0.177 (0.2)	0.0258 (0.03)		30	4.5 (5)	

1, 1982

GENETIC DEFECTS

	1	2	3	4	5	6	7
	Initial Population	Number of Births in 30 Years	Number of Spontaneous Birth Defects in 30 Years (10.7%)	30-Year Whole Body Dose (rem)*	Total Percent Increase (0.2% / rem)	BEIR-I Number of Increased Birth Defects (Col. 5 x Col. 3)	Percent Increase (Col. 6 + Col. 7) x 100
Atoll							
Rongelap (Rongelap)	233	541	58 (60)	2.500	.5	.29	
Likiep (Likiep)	487	1130	120.9 (120)	0.530	.106	.128	
Mejit	329	764	81.7 (80)	0.710	.142	.116	
Utrik (Utrik)	328	762	81.5 (80)	0.490	.098	.08	
Ujelang	100	230	25	0.130	.026	.0065	
Afluk (Afluk)	420	975	104.3 (100)	0.650	.13	.136	
Wotho (Wotho)	76	177	18.9 (20)	0.200	.04	.0076	
Taka (Taka)	100	230	25	0.140	.028	.007	
Jemo	100	230	25	0.330	.066	.0165	
Bikar	100	230	25	0.520	.104	.026	
Rongerik	100	230	25	1.800	.36	.09	
Ailinginae (Knox)	100	230	25	1.700	.36	.09	

\* Highest dose values were used. These were based on BNL Community A & B Surveys.  
 ( ) Numbers used in book.



GENETIC EFFECTS

4, 1982

8	9	10	11
30-Year WB Dose x Number of Births (Column 2 x Column 4)	BEIR-III Minimum Number of Increased Effects (Column 8 x 5 x 10 <sup>-6</sup> per rem)	Maximum Number of Increased Effects (Column 8 x 75 x 10 <sup>-6</sup> per rem)	Percent Increased (Column 10 ÷ Column 3 x 100)
1352.5	0.0068 (0.007)	0.10	
598.9	0.003	0.045 (0.05)	
542.44	0.0027 (0.003)	0.041 (0.04)	
373.4	0.0019 (0.002)	0.028 (0.03)	
29.9	0.00015 (0.0002)	0.0022 (0.002)	
633.75	0.0032 (0.003)	0.0475 (0.05)	
35.4	0.00018 (0.0002)	0.0027 (0.003)	
32.2	0.00016 (0.0002)	0.0024 (0.002)	
75.9	0.00038 (0.0004)	0.0057 (0.006)	
119.6	0.0006	0.009	
414.	0.0021 (0.002)	0.031 (0.03)	
391.	0.00196 (0.002)	0.029 (0.03)	



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