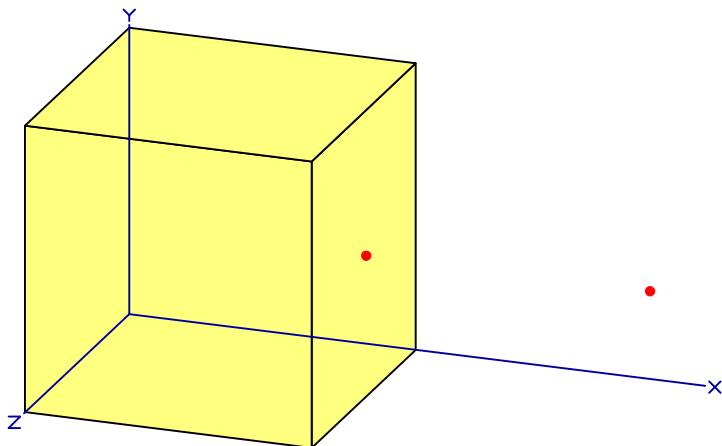


MicroShield v5.05 (5.05-00473)
American Ecology

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By: _____
Checked: _____

Case Title: MKM- 1m3 bag
Description: DU, U-238-124 pCi/g, U-234-20 pCi/g, U-235-5 pCi/g
Geometry: 13 - Rectangular Volume



Source Dimensions

Length	100.0 cm	3 ft 3.4 in
Width	100.0 cm	3 ft 3.4 in
Height	100.0 cm	3 ft 3.4 in

Dose Points

	<u>X</u>	<u>Y</u>	<u>Z</u>
# 1	101 cm	50 cm	50 cm
	3 ft 3.8 in	1 ft 7.7 in	1 ft 7.7 in
# 2	200 cm	50 cm	50 cm
	6 ft 6.7 in	1 ft 7.7 in	1 ft 7.7 in

Shields

<u>Shield Name</u>	<u>Dimension</u>	<u>Material</u>	<u>Density</u>
Source	1.0 m ³	Concrete	1.5
Air Gap		Air	0.00122

Source Input

Grouping Method : Standard Indices

Number of Groups : 25

Lower Energy Cutoff : 0.015

Photons < 0.015 : Excluded

Library : Grove

<u>Nuclide</u>	<u>curies</u>	<u>becquerels</u>	<u>uCi/cm³</u>	<u>Bq/cm³</u>
Ac-227	9.8515e-012	3.6450e-001	9.8515e-012	3.6450e-007
Bi-210	4.5362e-015	1.6784e-004	4.5362e-015	1.6784e-010
Bi-211	8.7480e-012	3.2368e-001	8.7480e-012	3.2368e-007
Bi-214	2.3034e-013	8.5224e-003	2.3034e-013	8.5224e-009
Fr-223	1.3594e-013	5.0299e-003	1.3594e-013	5.0299e-009
Pa-231	3.1670e-010	1.1718e+001	3.1670e-010	1.1718e-005
Pa-234	1.9840e-007	7.3408e+003	1.9840e-007	7.3408e-003
Pa-234m	1.2400e-004	4.5880e+006	1.2400e-004	4.5880e+000
Pb-210	4.6727e-015	1.7289e-004	4.6727e-015	1.7289e-010
Pb-211	8.7480e-012	3.2368e-001	8.7480e-012	3.2368e-007
Pb-214	2.3035e-013	8.5229e-003	2.3035e-013	8.5229e-009
Po-210	2.2921e-015	8.4808e-005	2.2921e-015	8.4808e-011
Po-211	2.3882e-014	8.8363e-004	2.3882e-014	8.8363e-010
Po-214	2.3029e-013	8.5206e-003	2.3029e-013	8.5206e-009
Po-215	8.7490e-012	3.2371e-001	8.7490e-012	3.2371e-007
Po-218	2.3041e-013	8.5252e-003	2.3041e-013	8.5252e-009
Ra-223	8.7490e-012	3.2371e-001	8.7490e-012	3.2371e-007
Ra-226	2.3392e-013	8.6550e-003	2.3392e-013	8.6550e-009
Rn-219	8.7490e-012	3.2371e-001	8.7490e-012	3.2371e-007
Rn-222	2.3041e-013	8.5253e-003	2.3041e-013	8.5253e-009
Th-227	9.0289e-012	3.3407e-001	9.0289e-012	3.3407e-007
Th-230	5.4011e-010	1.9984e+001	5.4011e-010	1.9984e-005
Th-231	7.5000e-006	2.7750e+005	7.5000e-006	2.7750e-001

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<u>Nuclide</u>	<u>curies</u>	<u>becquerels</u>	<u>µCi/cm³</u>	<u>Bq/cm³</u>
Th-234	1.2400e-004	4.5880e+006	1.2400e-004	4.5880e+000
Tl-207	8.7240e-012	3.2279e-001	8.7240e-012	3.2279e-007
U-234	3.0000e-005	1.1100e+006	3.0000e-005	1.1100e+000
U-235	7.5000e-006	2.7750e+005	7.5000e-006	2.7750e-001
U-238	1.2400e-004	4.5880e+006	1.2400e-004	4.5880e+000

Buildup
The material reference is : Source

Integration Parameters

X Direction	20
Y Direction	20
Z Direction	20

Results - Dose Point # 1 - (1.01,0.5,0.5) m

<u>Energy</u> <u>MeV</u>	<u>Activity</u> <u>photons/sec</u>	<u>Fluence Rate</u> <u>MeV/cm²/sec</u>	<u>Fluence Rate</u> <u>MeV/cm²/sec</u>	<u>Exposure Rate</u> <u>mR/hr</u>	<u>Exposure Rate</u> <u>mR/hr</u>
		<u>No Buildup</u>	<u>With Buildup</u>	<u>No Buildup</u>	<u>With Buildup</u>
0.015	5.220e+02	1.473e-08	1.562e-08	1.264e-09	1.340e-09
0.02	4.172e-02	2.890e-11	3.168e-11	1.001e-12	1.097e-12
0.03	4.066e+04	2.811e-04	3.448e-04	2.786e-06	3.417e-06
0.04	9.003e+00	1.893e-07	2.713e-07	8.371e-10	1.200e-09
0.05	1.310e+03	5.582e-05	9.481e-05	1.487e-07	2.526e-07
0.06	1.809e+05	1.251e-02	2.581e-02	2.484e-05	5.127e-05
0.08	3.907e+04	5.010e-03	1.281e-02	7.928e-06	2.027e-05
0.1	3.111e+05	5.891e-02	1.688e-01	9.013e-05	2.583e-04
0.15	4.553e+04	1.583e-02	4.882e-02	2.607e-05	8.039e-05
0.2	1.728e+05	8.976e-02	2.731e-01	1.584e-04	4.820e-04
0.3	5.342e+02	4.858e-04	1.376e-03	9.216e-07	2.610e-06
0.4	4.509e+02	6.127e-04	1.619e-03	1.194e-06	3.154e-06
0.5	6.694e+02	1.247e-03	3.110e-03	2.448e-06	6.104e-06
0.6	2.735e+03	6.613e-03	1.565e-02	1.291e-05	3.056e-05
0.8	1.523e+04	5.586e-02	1.223e-01	1.062e-04	2.325e-04
1.0	4.870e+04	2.479e-01	5.118e-01	4.569e-04	9.433e-04
1.5	1.027e+03	9.563e-03	1.779e-02	1.609e-05	2.992e-05
2.0	1.325e+02	1.892e-03	3.300e-03	2.925e-06	5.103e-06
TOTALS:	8.614e+05	5.065e-01	1.207e+00	9.100e-04	2.149e-03

Results - Dose Point # 2 - (2,0.5,0.5) m

<u>Energy</u> <u>MeV</u>	<u>Activity</u> <u>photons/sec</u>	<u>Fluence Rate</u> <u>MeV/cm²/sec</u>	<u>Fluence Rate</u> <u>MeV/cm²/sec</u>	<u>Exposure Rate</u> <u>mR/hr</u>	<u>Exposure Rate</u> <u>mR/hr</u>
		<u>No Buildup</u>	<u>With Buildup</u>	<u>No Buildup</u>	<u>With Buildup</u>
0.015	5.220e+02	4.506e-09	4.760e-09	3.865e-10	4.083e-10
0.02	4.172e-02	6.575e-12	7.171e-12	2.278e-13	2.484e-13
0.03	4.066e+04	4.332e-05	5.207e-05	4.294e-07	5.160e-07
0.04	9.003e+00	2.585e-08	3.600e-08	1.143e-10	1.592e-10
0.05	1.310e+03	7.288e-06	1.202e-05	1.941e-08	3.203e-08
0.06	1.809e+05	1.596e-03	3.192e-03	3.169e-06	6.341e-06
0.08	3.907e+04	6.244e-04	1.548e-03	9.882e-07	2.450e-06
0.1	3.111e+05	7.259e-03	2.006e-02	1.111e-05	3.068e-05

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<u>Energy</u>	<u>Activity</u>	<u>Fluence Rate</u>	<u>Fluence Rate</u>	<u>Exposure Rate</u>	<u>Exposure Rate</u>
<u>MeV</u>	<u>photons/sec</u>	<u>MeV/cm²/sec</u>	<u>MeV/cm²/sec</u>	<u>mR/hr</u>	<u>mR/hr</u>
		<u>No Buildup</u>	<u>With Buildup</u>	<u>No Buildup</u>	<u>With Buildup</u>
0.15	4.553e+04	1.924e-03	5.638e-03	3.169e-06	9.284e-06
0.2	1.728e+05	1.083e-02	3.109e-02	1.911e-05	5.488e-05
0.3	5.342e+02	5.798e-05	1.542e-04	1.100e-07	2.926e-07
0.4	4.509e+02	7.249e-05	1.796e-04	1.412e-07	3.500e-07
0.5	6.694e+02	1.465e-04	3.427e-04	2.875e-07	6.728e-07
0.6	2.735e+03	7.715e-04	1.716e-03	1.506e-06	3.349e-06
0.8	1.523e+04	6.443e-03	1.328e-02	1.226e-05	2.526e-05
1.0	4.870e+04	2.832e-02	5.518e-02	5.220e-05	1.017e-04
1.5	1.027e+03	1.072e-03	1.895e-03	1.803e-06	3.188e-06
2.0	1.325e+02	2.091e-04	3.491e-04	3.234e-07	5.399e-07
TOTALS:	8.614e+05	5.937e-02	1.347e-01	1.066e-04	2.395e-04