| | | Toxicity and Isotope-specific Information | | | | | | | Dose Compliance Concentrations for Radionuclides in Outdoor Surfaces (SDCCs) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Element (Atomic No.) | Radionuclide | Soil Volume External Exposure DCF (Infinite Volume) (mrem/yr per pCi/g) | Soil Volume External Exposure DCF (1 cm) (mrem/yr per pCi/g) | Soil Volume External Exposure DCF (5 cm) (mrem/yr per pCi/g) | External Exposure DCF (15 cm) (mrem/yr per pCi/g) | External Exposure DCF (Ground Plane) (mrem/yr per pCi/cm$^2$) | Lambda | $F_{surf}$ | Soil Volume Soil Volume SDCC (pCi/g) | Soil Volume 1cm SDCC (pCi/g) | Soil Volume 5cm SDCC (pCi/g) | Soil Volume 15cm SDCC (pCi/g) | Ground Plane SDCC (pCi/cm$^2$) | Soil Volume SDCC (mg/kg) |
| Actinium (89) | Ac-223 | 1.98E-02 | 4.81E-03 | 1.31E-02 | 1.87E-02 | 5.16E-03 | 1.66E+05 | 1.46 | 2.51E+07 | 1.03E+08 | 3.79E+07 | 2.66E+07 | 9.61E+07 | 6.55E-08 |
| Actinium (89) | Ac-223+D | 3.00E-01 | 6.98E-02 | 1.88E-01 | 2.80E-01 | 1.25E-01 | 1.66E+05 | | | | | | | |
| Actinium (89) | Ac-223+E | 3.00E-01 | 6.98E-02 | 1.88E-01 | 2.80E-01 | 1.25E-01 | 1.66E+05 | | | | | | | |
| Actinium (89) | Ac-224 | 7.72E-01 | 2.05E-01 | 5.50E-01 | 7.53E-01 | 2.07E-01 | 2.09E+03 | 1.33 | 8.95E+03 | 3.37E+04 | 1.26E+04 | 9.17E+03 | 3.35E+04 | 1.86E-09 |
| Actinium (89) | Ac-225 | 5.76E-02 | 1.64E-02 | 4.25E-02 | 5.65E-02 | 1.72E-02 | 2.53E+01 | 1.41 | 1.36E+03 | 4.79E+03 | 1.85E+03 | 1.39E+03 | 4.58E+03 | 2.36E-08 |
| Actinium (89) | Ac-225+D | 1.18E+00 | 2.54E-01 | 7.11E-01 | 1.07E+00 | 2.99E-01 | 2.53E+01 | 1.19 | 7.87E+01 | 3.67E+02 | 1.31E+02 | 8.69E+01 | 3.11E+02 | 1.36E-09 |
| Actinium (89) | Ac-225+E | 1.18E+00 | 2.54E-01 | 7.11E-01 | 1.07E+00 | 2.99E-01 | 2.53E+01 | | | | | | | |
| Actinium (89) | Ac-226 | 5.67E-01 | 1.40E-01 | 3.86E-01 | 5.48E-01 | 1.58E-01 | 2.09E+02 | 1.3 | 1.24E+03 | 5.05E+03 | 1.83E+03 | 1.29E+03 | 4.48E+03 | 2.61E-09 |
| Actinium (89) | Ac-227 | 4.46E-04 | 1.31E-04 | 3.36E-04 | 4.40E-04 | 1.65E-04 | 3.18E-02 | 1.43 | 6.96E+03 | 2.36E+04 | 9.24E+03 | 7.05E+03 | 1.89E+04 | 9.63E-05 |
| Actinium (89) | Ac-228 | 5.65E+00 | 1.07E+00 | 3.08E+00 | 4.89E+00 | 1.10E+00 | 9.90E+02 | 1.19 | 6.43E+02 | 3.38E+03 | 1.18E+03 | 7.43E+02 | 3.32E+03 | 2.87E-10 |
| Silver (47) | Ag-102 | 2.00E+01 | 3.71E+00 | 1.07E+01 | 1.71E+01 | 3.72E+00 | 2.82E+04 | 1.17 | 5.29E+03 | 2.85E+04 | 9.88E+03 | 6.19E+03 | 2.84E+04 | 3.71E-11 |
| Silver (47) | Ag-103 | 4.18E+00 | 8.47E-01 | 2.41E+00 | 3.73E+00 | 8.69E-01 | 5.54E+03 | 1.21 | 4.82E+03 | 2.38E+04 | 8.37E+03 | 5.40E+03 | 2.32E+04 | 1.74E-10 |
| Silver (47) | Ag-103+D | 4.18E+00 | 8.49E-01 | 2.41E+00 | 3.73E+00 | 8.80E-01 | 5.54E+03 | 1 | 5.80E+03 | 2.86E+04 | 1.01E+04 | 6.50E+03 | 2.75E+04 | 2.09E-10 |
| Silver (47) | Ag-104 | 1.56E+01 | 2.98E+00 | 8.56E+00 | 1.36E+01 | 2.94E+00 | 5.26E+03 | 1.18 | 1.25E+03 | 6.54E+03 | 2.28E+03 | 1.44E+03 | 6.64E+03 | 4.78E-11 |
| Silver (47) | Ag-104m | 6.88E+00 | 1.31E+00 | 3.75E+00 | 5.93E+00 | 1.33E+00 | 1.09E+04 | 1.18 | 5.87E+03 | 3.09E+04 | 1.08E+04 | 6.81E+03 | 3.04E+04 | 1.09E-10 |
| Silver (47) | Ag-105 | 2.70E+00 | 5.73E-01 | 1.63E+00 | 2.48E+00 | 5.72E-01 | 6.17E+00 | 1.23 | 8.11E+00 | 3.83E+01 | 1.35E+01 | 8.85E+00 | 3.84E+01 | 2.68E-10 |
| Silver (47) | Ag-106 | 3.90E+00 | 8.09E-01 | 2.29E+00 | 3.52E+00 | 8.65E-01 | 1.52E+04 | 1.21 | 1.41E+04 | 6.80E+04 | 2.40E+04 | 1.56E+04 | 6.37E+04 | 1.91E-10 |
| Silver (47) | Ag-106m | 1.64E+01 | 3.13E+00 | 9.01E+00 | 1.42E+01 | 3.08E+00 | 3.01E+01 | 1.18 | 6.81E+00 | 3.55E+01 | 1.24E+01 | 7.84E+00 | 3.61E+01 | 4.66E-11 |
| Silver (47) | Ag-108 | 1.14E-01 | 2.98E-02 | 7.03E-02 | 1.04E-01 | 1.05E-01 | 1.54E+05 | 1.21 | 4.86E+06 | 1.86E+07 | 7.90E+06 | 5.35E+06 | 5.31E+06 | 6.62E-09 |
| Silver (47) | Ag-108m | 9.01E+00 | 1.82E+00 | 5.20E+00 | 8.08E+00 | 1.81E+00 | 5.46E-03 | 1.2 | 4.06E-01 | 2.00E+00 | 7.02E-01 | 4.52E-01 | 2.02E+00 | 1.56E-08 |
| Silver (47) | Ag-108m+D | 9.03E+00 | 1.83E+00 | 5.20E+00 | 8.08E+00 | 1.82E+00 | 5.46E-03 | 1 | 4.87E-01 | 2.41E+00 | 8.44E-01 | 5.44E-01 | 2.41E+00 | 1.87E-08 |
| Silver (47) | Ag-108m+E | 9.03E+00 | 1.83E+00 | 5.20E+00 | 8.08E+00 | 1.82E+00 | | | | | | | | |
| Silver (47) | Ag-109m | 1.02E-02 | 4.16E-03 | 8.60E-03 | 1.02E-02 | 8.78E-03 | 5.52E+05 | 1.33 | 1.78E+08 | 4.37E+08 | 2.11E+08 | 1.77E+08 | 2.07E+08 | 6.81E-08 |
| Silver (47) | Ag-110 | 2.37E-01 | 6.99E-02 | 1.48E-01 | 2.14E-01 | 1.90E-01 | 8.88E+05 | 1.19 | 1.38E+07 | 4.68E+07 | 2.20E+07 | 1.52E+07 | 1.72E+07 | 3.32E-09 |
| Silver (47) | Ag-110m | 1.62E+01 | 3.06E+00 | 8.82E+00 | 1.40E+01 | 3.01E+00 | 1.01E+00 | 1.17 | 3.67E-01 | 1.94E+00 | 6.73E-01 | 4.24E-01 | 1.97E+00 | 7.74E-11 |
| Silver (47) | Ag-110m+D | 1.62E+01 | 3.06E+00 | 8.82E+00 | 1.40E+01 | 3.01E+00 | 1.01E+00 | 1 | 4.31E-01 | 2.28E+00 | 7.89E-01 | 4.97E-01 | 2.31E+00 | 9.08E-11 |
| Silver (47) | Ag-110m+E | 1.62E+01 | 3.06E+00 | 8.82E+00 | 1.40E+01 | 3.01E+00 | | | | | | | | |
| Silver (47) | Ag-111 | 1.40E-01 | 3.19E-02 | 8.78E-02 | 1.31E-01 | 6.16E-02 | 3.40E+01 | 1.22 | 8.75E+02 | 3.83E+03 | 1.39E+03 | 9.34E+02 | 1.98E+03 | 5.55E-09 |
| Silver (47) | Ag-112 | 4.05E+00 | 7.70E-01 | 2.16E+00 | 3.43E+00 | 8.71E-01 | 1.95E+03 | 1.16 | 1.81E+03 | 9.51E+03 | 3.38E+03 | 2.13E+03 | 8.41E+03 | 2.02E-10 |
| Silver (47) | Ag-115 | 4.31E+00 | 7.96E-01 | 2.26E+00 | 3.62E+00 | 8.75E-01 | 1.82E+04 | 1.16 | 1.60E+04 | 8.64E+04 | 3.05E+04 | 1.90E+04 | 7.86E+04 | 1.96E-10 |
| Aluminum (13) | Al-26 | 1.65E+01 | 2.93E+00 | 8.47E+00 | 1.37E+01 | 2.88E+00 | 9.68E-07 | 1.16 | 2.30E-01 | 1.30E+00 | 4.48E-01 | 2.77E-01 | 1.32E+00 | 1.20E-05 |
| Aluminum (13) | Al-28 | 1.16E+01 | 1.94E+00 | 5.61E+00 | 9.29E+00 | 2.00E+00 | 1.63E+05 | 1.13 | 5.44E+04 | 3.24E+05 | 1.12E+05 | 6.77E+04 | 3.15E+05 | 1.82E-11 |
| Americium (95) | Am-237 | 1.71E+00 | 3.95E-01 | 1.10E+00 | 1.60E+00 | 3.94E-01 | 4.99E+03 | 1.28 | 1.00E+04 | 4.33E+04 | 1.56E+04 | 1.07E+04 | 4.34E+04 | 9.22E-10 |
| Americium (95) | Am-238 | 5.02E+00 | 9.74E-01 | 2.78E+00 | 4.35E+00 | 9.65E-01 | 3.72E+03 | 1.21 | 2.69E+03 | 1.39E+04 | 4.85E+03 | 3.10E+03 | 1.40E+04 | 3.34E-10 |
| Americium (95) | Am-239 | 8.82E-01 | 2.37E-01 | 6.32E-01 | 8.62E-01 | 2.43E-01 | 5.10E+02 | 1.34 | 1.90E+03 | 7.07E+03 | 2.65E+03 | 1.94E+03 | 6.90E+03 | 1.72E-09 |
| Americium (95) | Am-240 | 5.84E+00 | 1.13E+00 | 3.21E+00 | 5.07E+00 | 1.12E+00 | 1.20E+02 | 1.21 | 7.42E+01 | 3.85E+02 | 1.35E+02 | 8.54E+01 | 3.88E+02 | 2.89E-10 |
| Americium (95) | Am-241 | 3.71E-02 | 1.84E-02 | 3.45E-02 | 3.71E-02 | 2.72E-02 | 1.60E-03 | 1.39 | 8.48E+01 | 1.71E+02 | 9.12E+01 | 8.48E+01 | 1.16E+02 | 2.47E-05 |
| Americium (95) | Am-242 | 4.48E-02 | 1.40E-02 | 3.51E-02 | 4.48E-02 | 1.88E-02 | 3.79E+02 | 1.38 | 2.69E+04 | 8.63E+04 | 3.43E+04 | 2.69E+04 | 6.41E+04 | 3.33E-08 |
| Americium (95) | Am-242m | 1.44E-03 | 6.47E-04 | 1.19E-03 | 1.43E-03 | 2.64E-03 | 4.56E-03 | 1.4 | 2.19E+03 | 4.86E+03 | 2.65E+03 | 2.20E+03 | 1.19E+03 | 2.09E-04 |
| Americium (95) | Am-242m+D | 6.15E-02 | 1.74E-02 | 4.44E-02 | 5.93E-02 | 2.44E-02 | 4.56E-03 | 1.31 | 5.45E+01 | 1.92E+02 | 7.56E+01 | 5.65E+01 | 1.38E+02 | 5.21E-06 |
| Americium (95) | Am-242m+E | 6.15E-02 | 1.75E-02 | 4.44E-02 | 5.95E-02 | 2.50E-02 | 4.56E-03 | | | | | | | |
| Americium (95) | Am-243 | 1.24E-01 | 4.90E-02 | 1.08E-01 | 1.24E-01 | 5.59E-02 | 9.39E-05 | 1.34 | 2.65E+01 | 6.69E+01 | 3.04E+01 | 2.65E+01 | 5.87E+01 | 1.33E-04 |
| Americium (95) | Am-243+D | 8.13E-01 | 2.26E-01 | 5.87E-01 | 7.91E-01 | 2.36E-01 | 9.39E-05 | 1.23 | 4.39E+00 | 1.58E+01 | 6.08E+00 | 4.52E+00 | 1.52E+01 | 2.21E-05 |
| Americium (95) | Am-243+E | 8.13E-01 | 2.26E-01 | 5.87E-01 | 7.91E-01 | 2.36E-01 | 9.39E-05 | | | | | | | |
| Americium (95) | Am-244 | 4.48E+00 | 8.84E-01 | 2.52E+00 | 3.95E+00 | 8.87E-01 | 6.01E+02 | 1.23 | 4.80E+02 | 2.43E+03 | 8.53E+02 | 5.43E+02 | 2.42E+03 | 3.78E-10 |
| Americium (95) | Am-244m | 1.07E-02 | 6.51E-03 | 8.95E-03 | 1.05E-02 | 6.48E-02 | 1.40E+04 | 1.39 | 4.11E+06 | 6.78E+06 | 4.93E+06 | 4.21E+06 | 6.81E+05 | 1.39E-07 |
| Americium (95) | Am-245 | 1.33E-01 | 3.43E-02 | 9.21E-02 | 1.29E-01 | 4.81E-02 | 2.96E+03 | 1.31 | 7.46E+04 | 2.89E+05 | 1.08E+05 | 7.71E+04 | 2.06E+05 | 1.20E-08 |
| Americium (95) | Am-246 | 3.67E+00 | 7.61E-01 | 2.14E+00 | 3.30E+00 | 7.94E-01 | 9.34E+03 | 1.25 | 8.91E+03 | 4.30E+04 | 1.53E+04 | 9.92E+03 | 4.13E+04 | 4.56E-10 |
| Americium (95) | Am-246m | 6.01E+00 | 1.13E+00 | 3.25E+00 | 5.17E+00 | 1.16E+00 | 1.46E+04 | 1.18 | 9.00E+03 | 4.78E+04 | 1.67E+04 | 1.05E+04 | 4.65E+04 | 2.95E-10 |
| Argon (18) | Ar-37 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.22E+00 | 0 | | | | | | |

| | | Toxicity and Isotope-specific Information | | | | | | | Dose Compliance Concentrations for Radionuclides in Outdoor Surfaces (SDCCs) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Element (Atomic No.) | Radionuclide | Soil Volume External Exposure DCF (Infinite Volume) (mrem/yr per pCi/g) | Soil Volume External Exposure DCF (1 cm) (mrem/yr per pCi/g) | Soil Volume External Exposure DCF (5 cm) (mrem/yr per pCi/g) | External Exposure DCF (15 cm) (mrem/yr per pCi/g) | External Exposure DCF (Ground Plane) (mrem/yr per pCi/cm$^2$) | Lambda | $F_{surf}$ | Soil Volume Soil Volume SDCC (pCi/g) | Soil Volume 1cm SDCC (pCi/g) | Soil Volume 5cm SDCC (pCi/g) | Soil Volume 15cm SDCC (pCi/g) | Ground Plane SDCC (pCi/cm$^2$) | Soil Volume SDCC (mg/kg) |
| Actinium (89) | Ac-223 | 1.98E-02 | 4.81E-03 | 1.31E-02 | 1.87E-02 | 5.16E-03 | 1.66E+05 | 1.46 | 2.51E+07 | 1.03E+08 | 3.79E+07 | 2.66E+07 | 9.61E+07 | 6.55E-08 |
| Argon (18) | Ar-39 | 8.02E-04 | 2.95E-04 | 6.29E-04 | 7.89E-04 | 2.95E-03 | 2.58E-03 | 1.25 | 4.36E+03 | 1.19E+04 | 5.56E+03 | 4.43E+03 | 1.18E+03 | 1.28E-04 |
| Argon (18) | Ar-41 | 7.93E+00 | 1.41E+00 | 4.08E+00 | 6.62E+00 | 1.42E+00 | 3.32E+03 | 1.15 | 1.59E+03 | 8.94E+03 | 3.09E+03 | 1.91E+03 | 8.87E+03 | 3.81E-11 |
| Arsenic (33) | As-69 | 5.60E+00 | 1.19E+00 | 3.32E+00 | 5.09E+00 | 1.30E+00 | 2.40E+04 | 1.2 | 1.56E+04 | 7.37E+04 | 2.63E+04 | 1.72E+04 | 6.75E+04 | 8.73E-11 |
| Arsenic (33) | As-69+D | 1.06E+01 | 2.16E+00 | 6.12E+00 | 9.49E+00 | 2.28E+00 | 2.40E+04 | 1.08 | 9.20E+03 | 4.51E+04 | 1.60E+04 | 1.03E+04 | 4.29E+04 | 5.14E-11 |
| Arsenic (33) | As-70 | 2.44E+01 | 4.55E+00 | 1.31E+01 | 2.09E+01 | 4.55E+00 | 6.92E+03 | 1.17 | 1.06E+03 | 5.71E+03 | 1.99E+03 | 1.24E+03 | 5.71E+03 | 2.09E-11 |
| Arsenic (33) | As-71 | 2.98E+00 | 6.38E-01 | 1.81E+00 | 2.74E+00 | 6.33E-01 | 9.37E+01 | 1.21 | 1.14E+02 | 5.32E+02 | 1.87E+02 | 1.24E+02 | 5.36E+02 | 1.67E-10 |
| Arsenic (33) | As-71+D | 2.98E+00 | 6.38E-01 | 1.81E+00 | 2.74E+00 | 6.33E-01 | 9.37E+01 | 1 | 1.38E+02 | 6.43E+02 | 2.27E+02 | 1.50E+02 | 6.49E+02 | 2.02E-10 |
| Arsenic (33) | As-72 | 1.03E+01 | 2.03E+00 | 5.80E+00 | 9.08E+00 | 2.11E+00 | 2.33E+02 | 1.19 | 8.37E+01 | 4.25E+02 | 1.49E+02 | 9.50E+01 | 4.09E+02 | 5.01E-11 |
| Arsenic (33) | As-73 | 7.83E-03 | 4.31E-03 | 7.52E-03 | 7.83E-03 | 6.05E-03 | 3.15E+00 | 1.51 | 1.22E+03 | 2.22E+03 | 1.27E+03 | 1.22E+03 | 1.58E+03 | 5.48E-08 |
| Arsenic (33) | As-74 | 4.21E+00 | 8.60E-01 | 2.44E+00 | 3.79E+00 | 8.72E-01 | 1.42E+01 | 1.2 | 1.24E+01 | 6.06E+01 | 2.13E+01 | 1.38E+01 | 5.98E+01 | 1.25E-10 |
| Arsenic (33) | As-76 | 2.54E+00 | 5.13E-01 | 1.42E+00 | 2.22E+00 | 6.12E-01 | 2.31E+02 | 1.18 | 3.37E+02 | 1.67E+03 | 6.00E+02 | 3.85E+02 | 1.40E+03 | 2.15E-10 |
| Arsenic (33) | As-77 | 4.53E-02 | 1.03E-02 | 2.87E-02 | 4.25E-02 | 1.65E-02 | 1.56E+02 | 1.22 | 1.24E+04 | 5.46E+04 | 1.95E+04 | 1.32E+04 | 3.40E+04 | 1.18E-08 |
| Arsenic (33) | As-78 | 7.63E+00 | 1.43E+00 | 4.05E+00 | 6.49E+00 | 1.51E+00 | 4.02E+03 | 1.16 | 1.98E+03 | 1.06E+04 | 3.73E+03 | 2.33E+03 | 1.00E+04 | 7.47E-11 |
| Astatine (85) | At-207 | 7.61E+00 | 1.45E+00 | 4.14E+00 | 6.55E+00 | 1.42E+00 | 3.37E+03 | 1.19 | 1.63E+03 | 8.55E+03 | 3.00E+03 | 1.89E+03 | 8.71E+03 | 1.94E-10 |
| Astatine (85) | At-211 | 1.03E-01 | 3.60E-02 | 8.41E-02 | 1.02E-01 | 3.87E-02 | 8.42E+02 | 1.4 | 2.56E+04 | 7.31E+04 | 3.13E+04 | 2.58E+04 | 6.79E+04 | 1.24E-08 |
| Astatine (85) | At-211+D | 1.29E-01 | 4.10E-02 | 9.88E-02 | 1.25E-01 | 4.38E-02 | 8.42E+02 | 1.02 | 2.81E+04 | 8.84E+04 | 3.67E+04 | 2.91E+04 | 8.29E+04 | 1.37E-08 |
| Astatine (85) | At-211+E | 3.82E+00 | 7.52E-01 | 2.14E+00 | 3.32E+00 | 7.49E-01 | 8.42E+02 | | | | | | | |
| Astatine (85) | At-215 | 1.02E-03 | 2.18E-04 | 6.21E-04 | 9.44E-04 | 2.15E-04 | 2.19E+11 | 1.21 | 7.73E+14 | 3.62E+15 | 1.27E+15 | 8.37E+14 | 3.68E+15 | 1.48E-06 |
| Astatine (85) | At-216 | 3.99E-03 | 1.41E-03 | 3.32E-03 | 3.99E-03 | 1.51E-03 | 7.28E+10 | 1.4 | 5.73E+13 | 1.62E+14 | 6.89E+13 | 5.73E+13 | 1.52E+14 | 3.30E-07 |
| Astatine (85) | At-217 | 1.65E-03 | 3.47E-04 | 9.81E-04 | 1.50E-03 | 3.42E-04 | 6.77E+08 | 1.21 | 1.48E+12 | 7.05E+12 | 2.49E+12 | 1.63E+12 | 7.15E+12 | 9.21E-07 |
| Astatine (85) | At-218 | 4.87E-03 | 2.70E-03 | 4.66E-03 | 4.87E-03 | 4.25E-03 | 1.09E+07 | 1.5 | 6.58E+09 | 1.18E+10 | 6.87E+09 | 6.58E+09 | 7.54E+09 | 2.55E-07 |
| Gold (79) | Au-193 | 5.48E-01 | 1.57E-01 | 3.94E-01 | 5.28E-01 | 1.66E-01 | 3.44E+02 | 1.31 | 2.09E+03 | 7.31E+03 | 2.91E+03 | 2.17E+03 | 6.92E+03 | 2.28E-09 |
| Gold (79) | Au-194 | 6.15E+00 | 1.16E+00 | 3.30E+00 | 5.24E+00 | 1.13E+00 | 1.54E+02 | 1.18 | 9.28E+01 | 4.94E+02 | 1.73E+02 | 1.09E+02 | 5.03E+02 | 2.27E-10 |
| Gold (79) | Au-195 | 1.81E-01 | 7.24E-02 | 1.58E-01 | 1.81E-01 | 8.23E-02 | 1.38E+00 | 1.4 | 3.19E+01 | 7.97E+01 | 3.66E+01 | 3.19E+01 | 7.01E+01 | 8.72E-09 |
| Gold (79) | Au-195m | 9.33E-01 | 2.18E-01 | 6.10E-01 | 8.90E-01 | 2.15E-01 | 7.17E+05 | 1.29 | 2.62E+06 | 1.12E+07 | 4.00E+06 | 2.75E+06 | 1.14E+07 | 1.38E-09 |
| Gold (79) | Au-198 | 2.16E+00 | 4.59E-01 | 1.31E+00 | 1.98E+00 | 4.75E-01 | 9.38E+01 | 1.21 | 1.57E+02 | 7.41E+02 | 2.60E+02 | 1.72E+02 | 7.16E+02 | 6.43E-10 |
| Gold (79) | Au-198m | 2.41E+00 | 6.12E-01 | 1.66E+00 | 2.33E+00 | 6.10E-01 | 1.10E+02 | 1.27 | 1.58E+02 | 6.21E+02 | 2.28E+02 | 1.63E+02 | 6.22E+02 | 5.51E-10 |
| Gold (79) | Au-199 | 3.54E-01 | 9.34E-02 | 2.52E-01 | 3.47E-01 | 9.30E-02 | 8.06E+01 | 1.29 | 7.72E+02 | 2.93E+03 | 1.09E+03 | 7.89E+02 | 2.94E+03 | 3.70E-09 |
| Gold (79) | Au-200 | 1.63E+00 | 3.17E-01 | 8.90E-01 | 1.40E+00 | 3.93E-01 | 7.53E+03 | 1.17 | 1.73E+04 | 8.88E+04 | 3.16E+04 | 2.00E+04 | 7.16E+04 | 8.91E-10 |
| Gold (79) | Au-200m | 1.13E+01 | 2.33E+00 | 6.68E+00 | 1.03E+01 | 2.31E+00 | 3.25E+02 | 1.2 | 1.04E+02 | 5.07E+02 | 1.77E+02 | 1.15E+02 | 5.12E+02 | 1.25E-10 |
| Gold (79) | Au-201 | 2.89E-01 | 6.32E-02 | 1.73E-01 | 2.63E-01 | 1.05E-01 | 1.38E+04 | 1.23 | 1.70E+05 | 7.78E+05 | 2.84E+05 | 1.87E+05 | 4.67E+05 | 4.81E-09 |
| Barium (56) | Ba-126 | 7.37E-01 | 1.64E-01 | 4.55E-01 | 6.83E-01 | 1.76E-01 | 3.77E+03 | 1.24 | 1.81E+04 | 8.10E+04 | 2.93E+04 | 1.95E+04 | 7.56E+04 | 1.17E-09 |
| Barium (56) | Ba-128 | 2.67E-01 | 6.60E-02 | 1.75E-01 | 2.54E-01 | 7.91E-02 | 1.04E+02 | 1.27 | 1.35E+03 | 5.45E+03 | 2.06E+03 | 1.42E+03 | 4.54E+03 | 3.22E-09 |
| Barium (56) | Ba-131 | 2.24E+00 | 4.90E-01 | 1.37E+00 | 2.05E+00 | 5.01E-01 | 2.14E+01 | 1.22 | 3.43E+01 | 1.56E+02 | 5.60E+01 | 3.74E+01 | 1.53E+02 | 4.06E-10 |
| Barium (56) | Ba-131m | 2.16E-01 | 6.88E-02 | 1.68E-01 | 2.14E-01 | 7.82E-02 | 2.49E+04 | 1.27 | 3.98E+05 | 1.25E+06 | 5.11E+05 | 4.01E+05 | 1.10E+06 | 4.05E-09 |
| Barium (56) | Ba-133 | 1.82E+00 | 4.18E-01 | 1.15E+00 | 1.70E+00 | 4.35E-01 | 6.45E-02 | 1.24 | 2.01E+00 | 8.75E+00 | 3.17E+00 | 2.14E+00 | 8.39E+00 | 8.04E-09 |
| Barium (56) | Ba-133m | 2.50E-01 | 6.06E-02 | 1.62E-01 | 2.37E-01 | 6.97E-02 | 1.56E+02 | 1.27 | 2.16E+03 | 8.90E+03 | 3.32E+03 | 2.28E+03 | 7.74E+03 | 3.57E-09 |
| Barium (56) | Ba-135m | 2.16E-01 | 5.35E-02 | 1.42E-01 | 2.07E-01 | 6.28E-02 | 2.12E+02 | 1.26 | 3.39E+03 | 1.37E+04 | 5.18E+03 | 3.54E+03 | 1.17E+04 | 4.20E-09 |
| Barium (56) | Ba-137m | 3.38E+00 | 6.71E-01 | 1.92E+00 | 3.00E+00 | 6.76E-01 | 1.43E+05 | 1.19 | 1.56E+05 | 7.82E+05 | 2.73E+05 | 1.75E+05 | 7.77E+05 | 2.90E-10 |
| Barium (56) | Ba-139 | 2.24E-01 | 6.68E-02 | 1.55E-01 | 2.13E-01 | 1.70E-01 | 4.40E+03 | 1.23 | 7.00E+04 | 2.35E+05 | 1.01E+05 | 7.36E+04 | 9.19E+04 | 4.28E-09 |
| Barium (56) | Ba-140 | 9.60E-01 | 2.03E-01 | 5.73E-01 | 8.77E-01 | 2.22E-01 | 1.99E+01 | 1.21 | 7.46E+01 | 3.52E+02 | 1.25E+02 | 8.17E+01 | 3.23E+02 | 1.02E-09 |
| Barium (56) | Ba-141 | 4.76E+00 | 9.57E-01 | 2.70E+00 | 4.20E+00 | 1.03E+00 | 1.99E+04 | 1.19 | 1.55E+04 | 7.70E+04 | 2.72E+04 | 1.75E+04 | 7.12E+04 | 2.12E-10 |
| Barium (56) | Ba-142 | 6.04E+00 | 1.16E+00 | 3.32E+00 | 5.24E+00 | 1.18E+00 | 3.44E+04 | 1.18 | 2.12E+04 | 1.10E+05 | 3.86E+04 | 2.44E+04 | 1.09E+05 | 1.70E-10 |
| Beryllium (4) | Be-10 | 1.00E-03 | 3.66E-04 | 7.85E-04 | 9.88E-04 | 3.98E-03 | 4.33E-07 | 1.25 | 3.48E+03 | 9.56E+03 | 4.45E+03 | 3.53E+03 | 8.78E+02 | 1.56E-01 |
| Beryllium (4) | Be-7 | 2.69E-01 | 5.60E-02 | 1.59E-01 | 2.44E-01 | 5.51E-02 | 4.75E+00 | 1.2 | 6.49E+01 | 3.12E+02 | 1.09E+02 | 7.13E+01 | 3.16E+02 | 1.86E-10 |
| Bismuth (83) | Bi-200 | 1.33E+01 | 2.67E+00 | 7.59E+00 | 1.18E+01 | 2.64E+00 | 1.00E+04 | 1.2 | 2.75E+03 | 1.37E+04 | 4.81E+03 | 3.10E+03 | 1.38E+04 | 1.07E-10 |
| Bismuth (83) | Bi-201 | 7.55E+00 | 1.48E+00 | 4.20E+00 | 6.58E+00 | 1.49E+00 | 3.37E+03 | 1.2 | 1.63E+03 | 8.34E+03 | 2.94E+03 | 1.87E+03 | 8.25E+03 | 1.89E-10 |
| Bismuth (83) | Bi-202 | 1.55E+01 | 3.00E+00 | 8.60E+00 | 1.35E+01 | 2.96E+00 | 3.64E+03 | 1.19 | 8.64E+02 | 4.47E+03 | 1.56E+03 | 9.92E+02 | 4.53E+03 | 9.32E-11 |
| Bismuth (83) | Bi-203 | 1.44E+01 | 2.59E+00 | 7.48E+00 | 1.20E+01 | 2.54E+00 | 5.16E+02 | 1.18 | 1.33E+02 | 7.39E+02 | 2.56E+02 | 1.59E+02 | 7.53E+02 | 1.02E-10 |

| | | Toxicity and Isotope-specific Information | | | | | | | Dose Compliance Concentrations for Radionuclides in Outdoor Surfaces (SDCCs) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Element (Atomic No.)** | **Radionuclide** | **Soil Volume External Exposure DCF (Infinite Volume) (mrem/yr per pCi/g)** | **Soil Volume External Exposure DCF (1 cm) (mrem/yr per pCi/g)** | **Soil Volume External Exposure DCF (5 cm) (mrem/yr per pCi/g)** | **External Exposure DCF (15 cm) (mrem/yr per pCi/g)** | **External Exposure DCF (Ground Plane) (mrem/yr per pCi/cm$^2$)** | **Lambda** | **$F_{surf}$** | **Soil Volume Soil Volume SDCC (pCi/g)** | **Soil Volume 1cm SDCC (pCi/g)** | **Soil Volume 5cm SDCC (pCi/g)** | **Soil Volume 15cm SDCC (pCi/g)** | **Ground Plane SDCC (pCi/cm$^2$)** | **Soil Volume SDCC (mg/kg)** |
| Actinium (89) | Ac-223 | 1.98E-02 | 4.81E-03 | 1.31E-02 | 1.87E-02 | 5.16E-03 | 1.66E+05 | 1.46 | 2.51E+07 | 1.03E+08 | 3.79E+07 | 2.66E+07 | 9.61E+07 | 6.55E-08 |
| Bismuth (83) | Bi-205 | 1.02E+01 | 1.84E+00 | 5.28E+00 | 8.50E+00 | 1.80E+00 | 1.65E+01 | 1.17 | 6.06E+00 | 3.36E+01 | 1.17E+01 | 7.26E+00 | 3.44E+01 | 1.46E-10 |
| Bismuth (83) | Bi-206 | 1.90E+01 | 3.62E+00 | 1.04E+01 | 1.64E+01 | 3.57E+00 | 4.05E+01 | 1.18 | 7.89E+00 | 4.15E+01 | 1.44E+01 | 9.15E+00 | 4.20E+01 | 7.78E-11 |
| Bismuth (83) | Bi-207 | 8.82E+00 | 1.70E+00 | 4.87E+00 | 7.67E+00 | 1.69E+00 | 1.82E-02 | 1.19 | 4.21E-01 | 2.18E+00 | 7.63E-01 | 4.85E-01 | 2.20E+00 | 9.27E-09 |
| Bismuth (83) | Bi-210 | 5.45E-03 | 3.15E-03 | 4.53E-03 | 5.35E-03 | 4.10E-02 | 5.05E+01 | 1.25 | 3.24E+04 | 5.59E+04 | 3.89E+04 | 3.29E+04 | 4.30E+03 | 2.61E-07 |
| Bismuth (83) | Bi-210m | 1.27E+00 | 2.85E-01 | 8.09E-01 | 1.20E+00 | 2.80E-01 | 2.31E-07 | 1.24 | 2.79E+00 | 1.24E+01 | 4.38E+00 | 2.96E+00 | 1.27E+01 | 4.92E-03 |
| Bismuth (83) | Bi-210m+D | 1.28E+00 | 2.93E-01 | 8.21E-01 | 1.21E+00 | 3.51E-01 | 2.31E-07 | 1.01 | 3.37E+00 | 1.48E+01 | 5.28E+00 | 3.58E+00 | 1.23E+01 | 5.95E-03 |
| Bismuth (83) | Bi-210m+E | 1.28E+00 | 2.93E-01 | 8.21E-01 | 1.21E+00 | 3.51E-01 | | | | | | | | |
| Bismuth (83) | Bi-211 | 2.37E-01 | 5.22E-02 | 1.48E-01 | 2.22E-01 | 5.13E-02 | 1.70E+05 | 1.23 | 2.56E+06 | 1.16E+07 | 4.10E+06 | 2.73E+06 | 1.18E+07 | 6.16E-09 |
| Bismuth (83) | Bi-212 | 1.11E+00 | 2.14E-01 | 6.02E-01 | 9.55E-01 | 2.63E-01 | 6.02E+03 | 1.2 | 1.98E+04 | 1.03E+05 | 3.65E+04 | 2.30E+04 | 8.38E+04 | 1.35E-09 |
| Bismuth (83) | Bi-212+D | 8.95E+00 | 1.49E+00 | 4.33E+00 | 7.18E+00 | 1.51E+00 | 6.02E+03 | 1.11 | 2.66E+03 | 1.59E+04 | 5.50E+03 | 3.31E+03 | 1.58E+04 | 1.82E-10 |
| Bismuth (83) | Bi-212+E | 8.95E+00 | 1.49E+00 | 4.33E+00 | 7.18E+00 | 1.51E+00 | 6.02E+03 | | | | | | | |
| Bismuth (83) | Bi-213 | 7.16E-01 | 1.54E-01 | 4.33E-01 | 6.55E-01 | 1.96E-01 | 7.98E+03 | 1.21 | 4.02E+04 | 1.87E+05 | 6.66E+04 | 4.40E+04 | 1.47E+05 | 2.08E-09 |
| Bismuth (83) | Bi-213+D | 9.81E-01 | 2.03E-01 | 5.71E-01 | 8.77E-01 | 2.49E-01 | 7.98E+03 | 1.03 | 3.45E+04 | 1.66E+05 | 5.93E+04 | 3.86E+04 | 1.36E+05 | 1.79E-09 |
| Bismuth (83) | Bi-213+E | 9.81E-01 | 2.03E-01 | 5.71E-01 | 8.77E-01 | 2.49E-01 | 7.98E+03 | | | | | | | |
| Bismuth (83) | Bi-214 | 9.33E+00 | 1.66E+00 | 4.79E+00 | 7.76E+00 | 1.68E+00 | 1.83E+04 | 1.16 | 7.44E+03 | 4.18E+04 | 1.45E+04 | 8.95E+03 | 4.13E+04 | 1.69E-10 |
| Bismuth (83) | Bi-214+D | 9.33E+00 | 1.66E+00 | 4.79E+00 | 7.76E+00 | 1.68E+00 | 1.83E+04 | 1 | 8.59E+03 | 4.83E+04 | 1.67E+04 | 1.03E+04 | 4.77E+04 | 1.95E-10 |
| Bismuth (83) | Bi-214+E | 9.33E+00 | 1.66E+00 | 4.79E+00 | 7.76E+00 | 1.73E+00 | 1.83E+04 | | | | | | | |
| Berkelium (97) | Bk-245 | 9.03E-01 | 2.37E-01 | 6.38E-01 | 8.78E-01 | 2.40E-01 | 5.12E+01 | 1.31 | 1.89E+02 | 7.21E+02 | 2.68E+02 | 1.94E+02 | 7.10E+02 | 1.76E-09 |
| Berkelium (97) | Bk-246 | 5.32E+00 | 1.04E+00 | 2.97E+00 | 4.64E+00 | 1.04E+00 | 1.38E+02 | 1.21 | 9.40E+01 | 4.79E+02 | 1.68E+02 | 1.08E+02 | 4.82E+02 | 3.25E-10 |
| Berkelium (97) | Bk-247 | 3.95E-01 | 1.08E-01 | 2.83E-01 | 3.84E-01 | 1.10E-01 | 5.02E-04 | 1.29 | 8.59E+00 | 3.15E+01 | 1.20E+01 | 8.84E+00 | 3.09E+01 | 8.20E-06 |
| Berkelium (97) | Bk-249 | 3.75E-06 | 2.31E-06 | 3.47E-06 | 3.73E-06 | 6.23E-06 | 7.90E-01 | 1.26 | 1.35E+06 | 2.18E+06 | 1.45E+06 | 1.35E+06 | 8.10E+05 | 8.23E-04 |
| Berkelium (97) | Bk-250 | 5.24E+00 | 9.83E-01 | 2.83E+00 | 4.51E+00 | 9.84E-01 | 1.88E+03 | 1.18 | 1.34E+03 | 7.13E+03 | 2.47E+03 | 1.55E+03 | 7.12E+03 | 3.44E-10 |
| Bromine (35) | Br-74 | 2.89E+01 | 4.83E+00 | 1.40E+01 | 2.31E+01 | 4.73E+00 | 1.44E+04 | 1.14 | 1.92E+03 | 1.15E+04 | 3.94E+03 | 2.39E+03 | 1.17E+04 | 1.91E-11 |
| Bromine (35) | Br-74m | 2.50E+01 | 4.48E+00 | 1.29E+01 | 2.09E+01 | 4.46E+00 | 8.78E+03 | 1.16 | 1.33E+03 | 7.41E+03 | 2.57E+03 | 1.59E+03 | 7.44E+03 | 2.17E-11 |
| Bromine (35) | Br-75 | 6.56E+00 | 1.38E+00 | 3.92E+00 | 5.99E+00 | 1.42E+00 | 3.72E+03 | 1.21 | 2.05E+03 | 9.75E+03 | 3.43E+03 | 2.25E+03 | 9.44E+03 | 8.02E-11 |
| Bromine (35) | Br-76 | 1.61E+01 | 2.87E+00 | 8.32E+00 | 1.34E+01 | 2.85E+00 | 3.75E+02 | 1.17 | 8.74E+01 | 4.91E+02 | 1.69E+02 | 1.05E+02 | 4.95E+02 | 3.44E-11 |
| Bromine (35) | Br-77 | 1.69E+00 | 3.54E-01 | 1.01E+00 | 1.54E+00 | 3.49E-01 | 1.08E+02 | 1.29 | 2.18E+02 | 1.04E+03 | 3.63E+02 | 2.38E+02 | 1.05E+03 | 3.00E-10 |
| Bromine (35) | Br-80 | 4.48E-01 | 9.19E-02 | 2.59E-01 | 4.01E-01 | 1.21E-01 | 2.09E+04 | 1.22 | 1.68E+05 | 8.18E+05 | 2.90E+05 | 1.88E+05 | 6.20E+05 | 1.25E-09 |
| Bromine (35) | Br-80m | 8.88E-03 | 6.86E-03 | 8.86E-03 | 8.88E-03 | 1.60E-02 | 1.37E+03 | 1.48 | 4.58E+05 | 5.92E+05 | 4.59E+05 | 4.58E+05 | 2.54E+05 | 5.17E-08 |
| Bromine (35) | Br-82 | 1.54E+01 | 2.95E+00 | 8.49E+00 | 1.34E+01 | 2.89E+00 | 1.72E+02 | 1.18 | 4.15E+01 | 2.18E+02 | 7.55E+01 | 4.77E+01 | 2.22E+02 | 3.84E-11 |
| Bromine (35) | Br-83 | 4.44E-02 | 1.01E-02 | 2.67E-02 | 4.03E-02 | 3.34E-02 | 2.54E+03 | 1.2 | 2.09E+05 | 9.21E+05 | 3.48E+05 | 2.30E+05 | 2.78E+05 | 1.33E-08 |
| Bromine (35) | Br-84 | 1.16E+01 | 1.94E+00 | 5.58E+00 | 9.25E+00 | 1.95E+00 | 1.15E+04 | 1.13 | 3.82E+03 | 2.29E+04 | 7.95E+03 | 4.80E+03 | 2.28E+04 | 5.43E-11 |
| Carbon (6) | C-11 | 5.60E+00 | 1.16E+00 | 3.30E+00 | 5.07E+00 | 1.18E+00 | 1.79E+04 | 1.2 | 1.17E+04 | 5.63E+04 | 1.98E+04 | 1.29E+04 | 5.53E+04 | 1.39E-11 |
| Carbon (6) | C-14 | 1.10E-05 | 6.43E-06 | 1.03E-05 | 1.10E-05 | 1.48E-05 | 1.21E-04 | 1.25 | 3.19E+05 | 5.43E+05 | 3.41E+05 | 3.19E+05 | 2.36E+05 | 7.15E-02 |
| Calcium (20) | Ca-41 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 4.95E-06 | 0 | | | | | | |
| Calcium (20) | Ca-45 | 5.32E-05 | 2.48E-05 | 4.66E-05 | 5.32E-05 | 4.40E-05 | 1.55E+00 | 1.51 | 1.08E+05 | 2.31E+05 | 1.23E+05 | 1.08E+05 | 1.30E+05 | 6.06E-06 |
| Calcium (20) | Ca-47 | 6.51E+00 | 1.17E+00 | 3.38E+00 | 5.46E+00 | 1.17E+00 | 5.58E+01 | 1.16 | 3.25E+01 | 1.81E+02 | 6.27E+01 | 3.87E+01 | 1.81E+02 | 5.31E-11 |
| Calcium (20) | Ca-49 | 2.16E+01 | 3.21E+00 | 9.47E+00 | 1.62E+01 | 3.12E+00 | 4.18E+04 | 1.1 | 7.72E+03 | 5.21E+04 | 1.76E+04 | 1.03E+04 | 5.36E+04 | 1.76E-11 |
| Cadmium (48) | Cd-104 | 1.22E+00 | 2.63E-01 | 7.27E-01 | 1.10E+00 | 2.75E-01 | 6.31E+03 | 1.25 | 1.81E+04 | 8.40E+04 | 3.04E+04 | 2.01E+04 | 8.02E+04 | 5.78E-10 |
| Cadmium (48) | Cd-107 | 4.49E-02 | 1.32E-02 | 3.02E-02 | 4.20E-02 | 2.72E-02 | 9.35E+02 | 1.33 | 6.86E+04 | 2.34E+05 | 1.02E+05 | 7.35E+04 | 1.13E+05 | 1.52E-08 |
| Cadmium (48) | Cd-109 | 1.22E-02 | 6.10E-03 | 1.06E-02 | 1.22E-02 | 1.94E-02 | 5.45E-01 | 1.33 | 3.49E+02 | 6.99E+02 | 4.03E+02 | 3.49E+02 | 2.20E+02 | 1.36E-07 |
| Cadmium (48) | Cd-113 | 9.77E-05 | 4.18E-05 | 8.30E-05 | 9.74E-05 | 6.77E-05 | 7.45E-17 | 1.25 | 2.40E+04 | 5.61E+04 | 2.82E+04 | 2.41E+04 | 3.46E+04 | 7.06E+10 |
| Cadmium (48) | Cd-113m | 6.01E-04 | 2.24E-04 | 4.74E-04 | 5.93E-04 | 2.07E-03 | 5.10E-02 | 1.25 | 5.97E+03 | 1.60E+04 | 7.56E+03 | 6.04E+03 | 1.73E+03 | 2.57E-05 |
| Cadmium (48) | Cd-115 | 1.27E+00 | 2.65E-01 | 7.52E-01 | 1.16E+00 | 2.84E-01 | 1.14E+02 | 1.2 | 3.25E+02 | 1.56E+03 | 5.50E+02 | 3.58E+02 | 1.46E+03 | 6.38E-10 |
| Cadmium (48) | Cd-115m | 1.47E-01 | 3.41E-02 | 8.36E-02 | 1.28E-01 | 1.08E-01 | 5.67E+00 | 1.17 | 1.45E+02 | 6.26E+02 | 2.56E+02 | 1.67E+02 | 1.98E+02 | 5.72E-09 |
| Cadmium (48) | Cd-117 | 6.51E+00 | 1.20E+00 | 3.47E+00 | 5.54E+00 | 1.21E+00 | 2.44E+03 | 1.17 | 1.41E+03 | 7.63E+03 | 2.64E+03 | 1.65E+03 | 7.55E+03 | 1.31E-10 |
| Cadmium (48) | Cd-117m | 1.28E+01 | 2.22E+00 | 6.43E+00 | 1.05E+01 | 2.16E+00 | 1.81E+03 | 1.15 | 5.39E+02 | 3.11E+03 | 1.07E+03 | 6.56E+02 | 3.20E+03 | 6.78E-11 |
| Cerium (58) | Ce-134 | 1.26E-02 | 1.03E-02 | 1.26E-02 | 1.26E-02 | 2.51E-02 | 8.43E+01 | 1.29 | 2.28E+04 | 2.78E+04 | 2.28E+04 | 2.28E+04 | 1.14E+04 | 7.02E-08 |
| Cerium (58) | Ce-135 | 9.74E+00 | 2.00E+00 | 5.73E+00 | 8.80E+00 | 1.98E+00 | 3.45E+02 | 1.2 | 1.29E+02 | 6.31E+02 | 2.20E+02 | 1.43E+02 | 6.35E+02 | 9.83E-11 |

| | | Toxicity and Isotope-specific Information | | | | | | | Dose Compliance Concentrations for Radionuclides in Outdoor Surfaces (SDCCs) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Element (Atomic No.)** | **Radionuclide** | **Soil Volume External Exposure DCF (Infinite Volume) (mrem/yr per pCi/g)** | **Soil Volume External Exposure DCF (1 cm) (mrem/yr per pCi/g)** | **Soil Volume External Exposure DCF (5 cm) (mrem/yr per pCi/g)** | **External Exposure DCF (15 cm) (mrem/yr per pCi/g)** | **External Exposure DCF (Ground Plane) (mrem/yr per pCi/cm$^2$)** | **Lambda** | **$F_{surf}$** | **Soil Volume Soil Volume SDCC (pCi/g)** | **Soil Volume 1cm SDCC (pCi/g)** | **Soil Volume 5cm SDCC (pCi/g)** | **Soil Volume 15cm SDCC (pCi/g)** | **Ground Plane SDCC (pCi/cm$^2$)** | **Soil Volume SDCC (mg/kg)** |
| Actinium (89) | Ac-223 | 1.98E-02 | 4.81E-03 | 1.31E-02 | 1.87E-02 | 5.16E-03 | 1.66E+05 | 1.46 | 2.51E+07 | 1.03E+08 | 3.79E+07 | 2.66E+07 | 9.61E+07 | 6.55E-08 |
| Cerium (58) | Ce-137 | 5.84E-02 | 2.00E-02 | 3.99E-02 | 5.43E-02 | 3.48E-02 | 6.75E+02 | 1.29 | 3.94E+04 | 1.15E+05 | 5.76E+04 | 4.24E+04 | 6.61E+04 | 1.55E-08 |
| Cerium (58) | Ce-137m | 1.76E-01 | 4.51E-02 | 1.15E-01 | 1.66E-01 | 5.51E-02 | 1.76E+02 | 1.26 | 3.48E+03 | 1.36E+04 | 5.32E+03 | 3.69E+03 | 1.11E+04 | 5.24E-09 |
| Cerium (58) | Ce-139 | 5.78E-01 | 1.54E-01 | 4.08E-01 | 5.67E-01 | 1.67E-01 | 1.84E+00 | 1.26 | 1.32E+01 | 4.94E+01 | 1.86E+01 | 1.34E+01 | 4.56E+01 | 1.93E-09 |
| Cerium (58) | Ce-141 | 2.89E-01 | 7.83E-02 | 2.09E-01 | 2.85E-01 | 8.09E-02 | 7.78E+00 | 1.25 | 9.44E+01 | 3.48E+02 | 1.31E+02 | 9.56E+01 | 3.37E+02 | 3.32E-09 |
| Cerium (58) | Ce-143 | 1.38E+00 | 3.04E-01 | 8.39E-01 | 1.26E+00 | 3.51E-01 | 1.84E+02 | 1.22 | 4.80E+02 | 2.17E+03 | 7.88E+02 | 5.23E+02 | 1.88E+03 | 7.23E-10 |
| Cerium (58) | Ce-144 | 6.45E-02 | 1.94E-02 | 4.87E-02 | 6.40E-02 | 2.15E-02 | 8.90E-01 | 1.26 | 8.13E+01 | 2.70E+02 | 1.08E+02 | 8.20E+01 | 2.44E+02 | 2.55E-08 |
| Cerium (58) | Ce-144+D | 3.32E-01 | 9.10E-02 | 2.01E-01 | 2.91E-01 | 2.11E-01 | 8.90E-01 | 1.1 | 1.80E+01 | 6.58E+01 | 2.97E+01 | 2.06E+01 | 2.84E+01 | 5.67E-09 |
| Cerium (58) | Ce-144+E | 3.32E-01 | 9.10E-02 | 2.01E-01 | 2.91E-01 | 2.11E-01 | 8.90E-01 | | | | | | | |
| Californium (98) | Cf-244 | 1.27E-04 | 1.24E-04 | 1.27E-04 | 1.27E-04 | 9.56E-04 | 1.88E+04 | 1.39 | 4.66E+08 | 4.77E+08 | 4.66E+08 | 4.66E+08 | 6.19E+07 | 1.18E-05 |
| Californium (98) | Cf-246 | 1.45E-04 | 1.02E-04 | 1.32E-04 | 1.45E-04 | 6.69E-04 | 1.70E+02 | 1.39 | 3.69E+06 | 5.23E+06 | 4.07E+06 | 3.69E+06 | 8.01E+05 | 1.03E-05 |
| Californium (98) | Cf-248 | 8.75E-05 | 8.52E-05 | 8.75E-05 | 8.75E-05 | 6.51E-04 | 7.58E-01 | 1.39 | 5.14E+04 | 5.27E+04 | 5.14E+04 | 5.14E+04 | 6.90E+03 | 3.26E-05 |
| Californium (98) | Cf-249 | 1.72E+00 | 3.73E-01 | 1.06E+00 | 1.59E+00 | 3.68E-01 | 1.98E-03 | 1.24 | 2.05E+00 | 9.47E+00 | 3.34E+00 | 2.22E+00 | 9.61E+00 | 5.02E-07 |
| Californium (98) | Cf-250 | 8.30E-05 | 8.09E-05 | 8.30E-05 | 8.30E-05 | 6.21E-04 | 5.30E-02 | 1.39 | 3.90E+04 | 3.99E+04 | 3.90E+04 | 3.90E+04 | 5.21E+03 | 3.57E-04 |
| Californium (98) | Cf-251 | 4.79E-01 | 1.28E-01 | 3.43E-01 | 4.70E-01 | 1.32E-01 | 7.72E-04 | 1.34 | 6.84E+00 | 2.57E+01 | 9.56E+00 | 6.98E+00 | 2.49E+01 | 4.32E-06 |
| Californium (98) | Cf-252 | 2.95E+00 | 5.13E-01 | 1.49E+00 | 2.42E+00 | 4.97E-01 | 2.63E-01 | 1.39 | 1.22E+00 | 6.98E+00 | 2.40E+00 | 1.48E+00 | 7.20E+00 | 2.26E-09 |
| Californium (98) | Cf-253 | 6.53E-05 | 3.00E-05 | 5.67E-05 | 6.51E-05 | 6.03E-05 | 1.42E+01 | 1.39 | 6.86E+05 | 1.49E+06 | 7.89E+05 | 6.88E+05 | 7.42E+05 | 2.37E-05 |
| Californium (98) | Cf-254 | 1.08E+02 | 1.88E+01 | 5.45E+01 | 8.86E+01 | 1.81E+01 | 4.18E+00 | 1.39 | 1.24E-01 | 7.10E-01 | 2.45E-01 | 1.51E-01 | 7.39E-01 | 1.46E-11 |
| Chlorine (17) | Cl-36 | 2.48E-03 | 9.08E-04 | 1.81E-03 | 2.39E-03 | 1.31E-02 | 2.30E-06 | 1.2 | 1.47E+03 | 4.02E+03 | 2.01E+03 | 1.53E+03 | 2.79E+02 | 4.46E-02 |
| Chlorine (17) | Cl-38 | 9.85E+00 | 1.64E+00 | 4.72E+00 | 7.83E+00 | 1.67E+00 | 9.79E+03 | 1.13 | 3.86E+03 | 2.32E+04 | 8.06E+03 | 4.86E+03 | 2.28E+04 | 2.91E-11 |
| Chlorine (17) | Cl-39 | 8.82E+00 | 1.59E+00 | 4.59E+00 | 7.39E+00 | 1.65E+00 | 6.55E+03 | 1.16 | 2.81E+03 | 1.56E+04 | 5.41E+03 | 3.36E+03 | 1.51E+04 | 3.25E-11 |
| Curium (96) | Cm-238 | 2.44E-01 | 7.37E-02 | 1.88E-01 | 2.42E-01 | 7.66E-02 | 2.53E+03 | 1.35 | 3.37E+04 | 1.12E+05 | 4.37E+04 | 3.39E+04 | 1.08E+05 | 6.15E-09 |
| Curium (96) | Cm-240 | 1.12E-04 | 1.06E-04 | 1.12E-04 | 1.12E-04 | 8.97E-04 | 9.37E+00 | 1.41 | 2.60E+05 | 2.75E+05 | 2.61E+05 | 2.60E+05 | 3.25E+04 | 1.29E-05 |
| Curium (96) | Cm-241 | 2.44E+00 | 5.41E-01 | 1.51E+00 | 2.26E+00 | 5.43E-01 | 7.71E+00 | 1.27 | 1.09E+01 | 4.92E+01 | 1.76E+01 | 1.18E+01 | 4.90E+01 | 6.60E-10 |
| Curium (96) | Cm-242 | 1.28E-04 | 1.02E-04 | 1.19E-04 | 1.27E-04 | 8.19E-04 | 1.55E+00 | 1.41 | 4.79E+04 | 6.01E+04 | 5.16E+04 | 4.84E+04 | 7.50E+03 | 1.45E-05 |
| Curium (96) | Cm-243 | 5.33E-01 | 1.35E-01 | 3.69E-01 | 5.17E-01 | 1.38E-01 | 2.43E-02 | 1.33 | 6.26E+00 | 2.47E+01 | 9.04E+00 | 6.46E+00 | 2.42E+01 | 1.21E-07 |
| Curium (96) | Cm-244 | 8.93E-05 | 8.62E-05 | 8.93E-05 | 8.93E-05 | 7.52E-04 | 3.83E-02 | 1.41 | 3.56E+04 | 3.69E+04 | 3.56E+04 | 3.56E+04 | 4.23E+03 | 4.40E-04 |
| Curium (96) | Cm-245 | 3.06E-01 | 8.99E-02 | 2.33E-01 | 3.04E-01 | 9.39E-02 | 8.15E-05 | 1.36 | 1.06E+01 | 3.59E+01 | 1.38E+01 | 1.06E+01 | 3.44E+01 | 6.15E-05 |
| Curium (96) | Cm-246 | 8.28E-05 | 7.89E-05 | 8.26E-05 | 8.28E-05 | 6.72E-04 | 1.47E-04 | 1.41 | 3.77E+04 | 3.95E+04 | 3.77E+04 | 3.77E+04 | 4.64E+03 | 1.23E-01 |
| Curium (96) | Cm-247 | 1.65E+00 | 3.54E-01 | 1.01E+00 | 1.53E+00 | 3.49E-01 | 4.44E-08 | 1.23 | 2.16E+00 | 1.01E+01 | 3.54E+00 | 2.34E+00 | 1.02E+01 | 2.33E-02 |
| Curium (96) | Cm-247+D | 1.72E+00 | 3.79E-01 | 1.06E+00 | 1.60E+00 | 3.76E-01 | 4.44E-08 | 1.02 | 2.49E+00 | 1.14E+01 | 4.04E+00 | 2.69E+00 | 1.14E+01 | 2.69E-02 |
| Curium (96) | Cm-247+E | 1.72E+00 | 3.79E-01 | 1.06E+00 | 1.60E+00 | 3.76E-01 | | | | | | | | |
| Curium (96) | Cm-248 | 8.47E+00 | 1.47E+00 | 4.27E+00 | 6.96E+00 | 1.42E+00 | 1.99E-06 | 1.41 | 3.68E-01 | 2.12E+00 | 7.30E-01 | 4.48E-01 | 2.19E+00 | 8.90E-05 |
| Curium (96) | Cm-249 | 1.07E-01 | 2.26E-02 | 6.32E-02 | 9.70E-02 | 3.87E-02 | 5.68E+03 | 1.2 | 1.93E+05 | 9.17E+05 | 3.27E+05 | 2.13E+05 | 5.34E+05 | 1.64E-08 |
| Curium (96) | Cm-250 | 6.25E+01 | 1.09E+01 | 3.15E+01 | 5.13E+01 | 1.05E+01 | 7.14E-05 | 0 | | | | | | |
| Curium (96) | Cm-250+D | 1.63E+00 | | | | | 7.14E-05 | 1.2 | 2.24E+00 | | | | | 1.52E-05 |
| Curium (96) | Cm-250+E | 6.42E+01 | 1.12E+01 | 3.25E+01 | 5.28E+01 | 1.08E+01 | 7.14E-05 | | | | | | | |
| Cobalt (27) | Co-55 | 1.15E+01 | 2.24E+00 | 6.42E+00 | 1.01E+01 | 2.25E+00 | 3.46E+02 | 1.18 | 1.11E+02 | 5.74E+02 | 2.00E+02 | 1.27E+02 | 5.70E+02 | 3.44E-11 |
| Cobalt (27) | Co-56 | 2.24E+01 | 3.88E+00 | 1.12E+01 | 1.83E+01 | 3.77E+00 | 3.21E+00 | 1.15 | 5.70E-01 | 3.29E+00 | 1.14E+00 | 6.96E-01 | 3.39E+00 | 1.93E-11 |
| Cobalt (27) | Co-57 | 4.55E-01 | 1.28E-01 | 3.38E-01 | 4.49E-01 | 1.26E-01 | 9.34E-01 | 1.28 | 1.16E+01 | 4.11E+01 | 1.56E+01 | 1.17E+01 | 4.17E+01 | 1.37E-09 |
| Cobalt (27) | Co-58 | 5.60E+00 | 1.09E+00 | 3.13E+00 | 4.92E+00 | 1.08E+00 | 3.57E+00 | 1.18 | 2.44E+00 | 1.25E+01 | 4.35E+00 | 2.77E+00 | 1.26E+01 | 7.68E-11 |
| Cobalt (27) | Co-58m | 1.78E-06 | 1.74E-06 | 1.78E-06 | 1.78E-06 | 7.76E-06 | 6.63E+02 | 1.32 | 1.24E+09 | 1.27E+09 | 1.24E+09 | 1.24E+09 | 2.84E+08 | 2.10E-04 |
| Cobalt (27) | Co-60 | 1.54E+01 | 2.74E+00 | 7.96E+00 | 1.29E+01 | 2.68E+00 | 1.31E-01 | 1.16 | 2.63E-01 | 1.48E+00 | 5.08E-01 | 3.14E-01 | 1.51E+00 | 2.33E-10 |
| Cobalt (27) | Co-60m | 2.31E-02 | 4.76E-03 | 1.27E-02 | 1.96E-02 | 5.11E-03 | 3.48E+04 | 1.18 | 5.59E+06 | 2.72E+07 | 1.02E+07 | 6.61E+06 | 2.53E+07 | 1.87E-08 |
| Cobalt (27) | Co-61 | 3.17E-01 | 9.25E-02 | 2.18E-01 | 2.93E-01 | 1.51E-01 | 3.68E+03 | 1.22 | 4.16E+04 | 1.43E+05 | 6.04E+04 | 4.50E+04 | 8.76E+04 | 1.34E-09 |
| Cobalt (27) | Co-62m | 1.68E+01 | 2.97E+00 | 8.58E+00 | 1.39E+01 | 3.01E+00 | 2.62E+04 | 1.15 | 5.94E+03 | 3.36E+04 | 1.16E+04 | 7.15E+03 | 3.31E+04 | 2.73E-11 |
| Chromium (24) | Cr-48 | 2.05E+00 | 4.81E-01 | 1.34E+00 | 1.94E+00 | 4.71E-01 | 2.64E+02 | 1.22 | 4.61E+02 | 1.97E+03 | 7.06E+02 | 4.88E+02 | 2.01E+03 | 1.62E-10 |
| Chromium (24) | Cr-49 | 5.58E+00 | 1.19E+00 | 3.36E+00 | 5.09E+00 | 1.25E+00 | 8.65E+03 | 1.2 | 5.65E+03 | 2.64E+04 | 9.39E+03 | 6.19E+03 | 2.52E+04 | 6.21E-11 |
| Chromium (24) | Cr-51 | 1.62E-01 | 3.54E-02 | 1.01E-01 | 1.52E-01 | 3.47E-02 | 9.13E+00 | 1.22 | 2.03E+02 | 9.27E+02 | 3.24E+02 | 2.17E+02 | 9.47E+02 | 2.20E-09 |
| Cesium (55) | Cs-125 | 3.67E+00 | 7.59E-01 | 2.14E+00 | 3.32E+00 | 7.99E-01 | 8.09E+03 | 1.2 | 8.01E+03 | 3.88E+04 | 1.37E+04 | 8.87E+03 | 3.68E+04 | 2.40E-10 |

| | | Toxicity and Isotope-specific Information | | | | | | | Dose Compliance Concentrations for Radionuclides in Outdoor Surfaces (SDCCs) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Element (Atomic No.) | Radionuclide | Soil Volume External Exposure DCF (Infinite Volume) (mrem/yr per pCi/g) | Soil Volume External Exposure DCF (1 cm) (mrem/yr per pCi/g) | Soil Volume External Exposure DCF (5 cm) (mrem/yr per pCi/g) | External Exposure DCF (15 cm) (mrem/yr per pCi/g) | External Exposure DCF (Ground Plane) (mrem/yr per pCi/cm$^2$) | Lambda | $F_{surf}$ | Soil Volume Soil Volume SDCC (pCi/g) | Soil Volume 1cm SDCC (pCi/g) | Soil Volume 5cm SDCC (pCi/g) | Soil Volume 15cm SDCC (pCi/g) | Ground Plane SDCC (pCi/cm$^2$) | Soil Volume SDCC (mg/kg) |
| Actinium (89) | Ac-223 | 1.98E-02 | 4.81E-03 | 1.31E-02 | 1.87E-02 | 5.16E-03 | 1.66E+05 | 1.46 | 2.51E+07 | 1.03E+08 | 3.79E+07 | 2.66E+07 | 9.61E+07 | 6.55E-08 |
| Cesium (55) | Cs-126 | 6.01E+00 | 1.28E+00 | 3.58E+00 | 5.46E+00 | 1.38E+00 | 2.22E+05 | 1.2 | 1.35E+05 | 6.31E+05 | 2.26E+05 | 1.48E+05 | 5.87E+05 | 1.48E-10 |
| Cesium (55) | Cs-127 | 2.13E+00 | 4.53E-01 | 1.28E+00 | 1.94E+00 | 4.61E-01 | 9.71E+02 | 1.22 | 1.64E+03 | 7.69E+03 | 2.73E+03 | 1.80E+03 | 7.56E+03 | 4.16E-10 |
| Cesium (55) | Cs-128 | 4.96E+00 | 1.04E+00 | 2.93E+00 | 4.49E+00 | 1.11E+00 | 9.34E+04 | 1.2 | 6.86E+04 | 3.28E+05 | 1.16E+05 | 7.57E+04 | 3.06E+05 | 1.82E-10 |
| Cesium (55) | Cs-129 | 1.33E+00 | 2.91E-01 | 8.11E-01 | 1.23E+00 | 3.06E-01 | 1.89E+02 | 1.24 | 5.05E+02 | 2.30E+03 | 8.26E+02 | 5.47E+02 | 2.19E+03 | 6.68E-10 |
| Cesium (55) | Cs-130 | 2.80E+00 | 5.82E-01 | 1.64E+00 | 2.54E+00 | 6.31E-01 | 1.22E+04 | 1.21 | 1.58E+04 | 7.60E+04 | 2.69E+04 | 1.74E+04 | 7.01E+04 | 3.27E-10 |
| Cesium (55) | Cs-131 | 7.83E-03 | 7.03E-03 | 7.83E-03 | 7.83E-03 | 2.09E-02 | 2.61E+01 | 1.3 | 1.12E+04 | 1.25E+04 | 1.12E+04 | 1.12E+04 | 4.22E+03 | 1.10E-07 |
| Cesium (55) | Cs-132 | 3.88E+00 | 7.78E-01 | 2.22E+00 | 3.45E+00 | 7.81E-01 | 3.91E+01 | 1.2 | 3.68E+01 | 1.83E+02 | 6.43E+01 | 4.14E+01 | 1.83E+02 | 2.41E-10 |
| Cesium (55) | Cs-134 | 8.90E+00 | 1.75E+00 | 5.02E+00 | 7.85E+00 | 1.73E+00 | 3.36E-01 | 1.19 | 4.89E-01 | 2.49E+00 | 8.67E-01 | 5.54E-01 | 2.52E+00 | 3.78E-10 |
| Cesium (55) | Cs-134m | 6.49E-02 | 2.05E-02 | 4.92E-02 | 6.43E-02 | 2.63E-02 | 2.09E+03 | 1.29 | 1.09E+05 | 3.46E+05 | 1.44E+05 | 1.10E+05 | 2.70E+05 | 1.36E-08 |
| Cesium (55) | Cs-135 | 3.21E-05 | 1.62E-05 | 2.89E-05 | 3.21E-05 | 3.14E-05 | 3.01E-07 | 1.25 | 1.09E+05 | 2.15E+05 | 1.21E+05 | 1.09E+05 | 1.11E+05 | 9.47E+01 |
| Cesium (55) | Cs-135m | 9.19E+00 | 1.78E+00 | 5.11E+00 | 8.04E+00 | 1.76E+00 | 6.87E+03 | 1.18 | 2.78E+03 | 1.43E+04 | 5.00E+03 | 3.18E+03 | 1.45E+04 | 1.06E-10 |
| Cesium (55) | Cs-136 | 1.25E+01 | 2.41E+00 | 6.90E+00 | 1.09E+01 | 2.37E+00 | 1.93E+01 | 1.18 | 5.75E+00 | 2.99E+01 | 1.04E+01 | 6.60E+00 | 3.04E+01 | 7.85E-11 |
| Cesium (55) | Cs-137 | 8.34E-04 | 3.86E-04 | 6.75E-04 | 8.21E-04 | 3.49E-03 | 2.31E-02 | 1.25 | 4.24E+03 | 9.15E+03 | 5.23E+03 | 4.31E+03 | 1.01E+03 | 4.88E-05 |
| Cesium (55) | Cs-137+D | 3.19E+00 | 6.36E-01 | 1.82E+00 | 2.83E+00 | 6.43E-01 | 2.31E-02 | 1.19 | 1.17E+00 | 5.85E+00 | 2.05E+00 | 1.31E+00 | 5.79E+00 | 1.34E-08 |
| Cesium (55) | Cs-137+E | 3.19E+00 | 6.36E-01 | 1.82E+00 | 2.83E+00 | 6.43E-01 | 2.31E-02 | | | | | | | |
| Cesium (55) | Cs-138 | 1.48E+01 | 2.59E+00 | 7.50E+00 | 1.22E+01 | 2.64E+00 | 1.13E+04 | 1.15 | 2.92E+03 | 1.66E+04 | 5.75E+03 | 3.54E+03 | 1.63E+04 | 6.91E-11 |
| Copper (29) | Cu-60 | 2.39E+01 | 4.27E+00 | 1.23E+01 | 2.00E+01 | 4.25E+00 | 1.57E+04 | 1.16 | 2.49E+03 | 1.39E+04 | 4.82E+03 | 2.98E+03 | 1.40E+04 | 1.85E-11 |
| Copper (29) | Cu-61 | 4.57E+00 | 9.38E-01 | 2.67E+00 | 4.12E+00 | 9.58E-01 | 1.78E+03 | 1.2 | 1.43E+03 | 6.95E+03 | 2.44E+03 | 1.58E+03 | 6.80E+03 | 9.48E-11 |
| Copper (29) | Cu-62 | 5.60E+00 | 1.18E+00 | 3.30E+00 | 5.07E+00 | 1.30E+00 | 3.74E+04 | 1.2 | 2.44E+04 | 1.16E+05 | 4.13E+04 | 2.69E+04 | 1.05E+05 | 7.85E-11 |
| Copper (29) | Cu-64 | 1.04E+00 | 2.14E-01 | 6.12E-01 | 9.44E-01 | 2.14E-01 | 4.78E+02 | 1.2 | 1.67E+03 | 8.15E+03 | 2.86E+03 | 1.85E+03 | 8.18E+03 | 4.35E-10 |
| Copper (29) | Cu-66 | 5.58E-01 | 1.24E-01 | 3.11E-01 | 4.81E-01 | 2.37E-01 | 7.14E+04 | 1.17 | 4.82E+05 | 2.17E+06 | 8.62E+05 | 5.58E+05 | 1.13E+06 | 8.63E-10 |
| Copper (29) | Cu-67 | 4.87E-01 | 1.24E-01 | 3.39E-01 | 4.74E-01 | 1.23E-01 | 9.81E+01 | 1.24 | 7.14E+02 | 2.80E+03 | 1.02E+03 | 7.34E+02 | 2.84E+03 | 9.46E-10 |
| Dysprosium (66) | Dy-155 | 3.06E+00 | 6.23E-01 | 1.75E+00 | 2.70E+00 | 6.28E-01 | 6.07E+02 | 1.19 | 7.29E+02 | 3.58E+03 | 1.27E+03 | 8.24E+02 | 3.55E+03 | 3.61E-10 |
| Dysprosium (66) | Dy-157 | 1.67E+00 | 3.82E-01 | 1.06E+00 | 1.57E+00 | 3.89E-01 | 7.49E+02 | 1.23 | 1.60E+03 | 7.01E+03 | 2.53E+03 | 1.71E+03 | 6.90E+03 | 6.52E-10 |
| Dysprosium (66) | Dy-159 | 4.46E-02 | 2.82E-02 | 4.38E-02 | 4.46E-02 | 4.52E-02 | 1.75E+00 | 1.27 | 1.64E+02 | 2.59E+02 | 1.67E+02 | 1.64E+02 | 1.62E+02 | 2.89E-08 |
| Dysprosium (66) | Dy-165 | 1.23E-01 | 3.13E-02 | 7.76E-02 | 1.12E-01 | 8.06E-02 | 2.60E+03 | 1.22 | 7.63E+04 | 2.99E+05 | 1.21E+05 | 8.34E+04 | 1.16E+05 | 9.39E-09 |
| Dysprosium (66) | Dy-166 | 7.93E-02 | 3.19E-02 | 6.51E-02 | 7.76E-02 | 4.10E-02 | 7.44E+01 | 1.26 | 3.26E+03 | 8.10E+03 | 3.97E+03 | 3.33E+03 | 6.31E+03 | 1.41E-08 |
| Erbium (68) | Er-161 | 5.11E+00 | 1.00E+00 | 2.83E+00 | 4.44E+00 | 9.98E-01 | 1.87E+03 | 1.18 | 1.36E+03 | 6.95E+03 | 2.45E+03 | 1.57E+03 | 6.96E+03 | 2.27E-10 |
| Erbium (68) | Er-165 | 4.21E-02 | 2.54E-02 | 4.10E-02 | 4.21E-02 | 3.78E-02 | 5.86E+02 | 1.27 | 4.80E+04 | 7.98E+04 | 4.93E+04 | 4.80E+04 | 5.35E+04 | 2.62E-08 |
| Erbium (68) | Er-169 | 1.20E-04 | 4.98E-05 | 1.01E-04 | 1.20E-04 | 7.88E-05 | 2.72E+01 | 1.25 | 7.89E+05 | 1.91E+06 | 9.38E+05 | 7.92E+05 | 1.21E+06 | 9.51E-06 |
| Erbium (68) | Er-171 | 1.81E+00 | 4.18E-01 | 1.16E+00 | 1.70E+00 | 4.49E-01 | 8.07E+02 | 1.22 | 1.60E+03 | 6.93E+03 | 2.50E+03 | 1.70E+03 | 6.44E+03 | 6.58E-10 |
| Erbium (68) | Er-172 | 2.76E+00 | 5.82E-01 | 1.64E+00 | 2.50E+00 | 5.79E-01 | 1.23E+02 | 1.2 | 1.63E+02 | 7.71E+02 | 2.74E+02 | 1.80E+02 | 7.75E+02 | 4.41E-10 |
| Einsteinium (99) | Es-250 | 2.11E+00 | 4.27E-01 | 1.20E+00 | 1.86E+00 | 4.26E-01 | 2.89E+03 | 1.22 | 4.91E+03 | 2.42E+04 | 8.59E+03 | 5.58E+03 | 2.43E+04 | 8.24E-10 |
| Einsteinium (99) | Es-251 | 3.26E-01 | 9.38E-02 | 2.46E-01 | 3.25E-01 | 9.79E-02 | 1.84E+02 | 1.33 | 1.85E+03 | 6.44E+03 | 2.46E+03 | 1.86E+03 | 6.17E+03 | 4.90E-09 |
| Einsteinium (99) | Es-253 | 1.61E-03 | 4.14E-04 | 1.04E-03 | 1.50E-03 | 7.74E-04 | 1.24E+01 | 1.38 | 2.44E+04 | 9.47E+04 | 3.78E+04 | 2.61E+04 | 5.07E+04 | 9.69E-07 |
| Einsteinium (99) | Es-254 | 1.13E-02 | 4.16E-03 | 8.47E-03 | 1.09E-02 | 1.14E-02 | 9.17E-01 | 1.39 | 4.26E+02 | 1.16E+03 | 5.70E+02 | 4.42E+02 | 4.24E+02 | 2.29E-07 |
| Einsteinium (99) | Es-254+D | 5.26E+00 | 9.87E-01 | 2.83E+00 | 4.53E+00 | 9.95E-01 | 9.17E-01 | 1.18 | 1.08E+00 | 5.77E+00 | 2.01E+00 | 1.26E+00 | 5.72E+00 | 5.81E-10 |
| Einsteinium (99) | Es-254+E | 5.26E+00 | 9.87E-01 | 2.83E+00 | 4.53E+00 | 9.97E-01 | 9.17E-01 | | | | | | | |
| Einsteinium (99) | Es-254m | 2.63E+00 | 5.24E-01 | 1.50E+00 | 2.33E+00 | 5.34E-01 | 1.54E+02 | 1.21 | 2.13E+02 | 1.07E+03 | 3.74E+02 | 2.41E+02 | 1.05E+03 | 6.81E-10 |
| Europium (63) | Eu-145 | 8.65E+00 | 1.59E+00 | 4.55E+00 | 7.31E+00 | 1.56E+00 | 4.26E+01 | 1.17 | 1.85E+01 | 1.01E+02 | 3.52E+01 | 2.19E+01 | 1.02E+02 | 1.22E-10 |
| Europium (63) | Eu-146 | 1.45E+01 | 2.78E+00 | 7.96E+00 | 1.26E+01 | 2.74E+00 | 5.49E+01 | 1.18 | 1.41E+01 | 7.35E+01 | 2.56E+01 | 1.62E+01 | 7.45E+01 | 7.27E-11 |
| Europium (63) | Eu-147 | 2.56E+00 | 5.30E-01 | 1.47E+00 | 2.28E+00 | 5.39E-01 | 1.05E+01 | 1.2 | 1.51E+01 | 7.29E+01 | 2.62E+01 | 1.70E+01 | 7.16E+01 | 4.09E-10 |
| Europium (63) | Eu-148 | 1.23E+01 | 2.42E+00 | 6.92E+00 | 1.09E+01 | 2.40E+00 | 4.64E+00 | 1.19 | 1.40E+00 | 7.14E+00 | 2.50E+00 | 1.59E+00 | 7.20E+00 | 8.69E-11 |
| Europium (63) | Eu-149 | 1.83E-01 | 5.20E-02 | 1.23E-01 | 1.73E-01 | 6.61E-02 | 2.72E+00 | 1.26 | 5.54E+01 | 1.95E+02 | 8.25E+01 | 5.88E+01 | 1.54E+02 | 5.89E-09 |
| Europium (63) | Eu-150 | 8.15E+00 | 1.66E+00 | 4.74E+00 | 7.31E+00 | 1.66E+00 | 2.03E-02 | | | | | | | |
| Europium (63) | Eu-150m | 2.46E-01 | 5.24E-02 | 1.45E-01 | 2.20E-01 | 7.91E-02 | 4.81E+02 | | | | | | | |
| Europium (63) | Eu-152 | 6.60E+00 | 1.26E+00 | 3.60E+00 | 5.69E+00 | 1.26E+00 | 5.20E-02 | 1.18 | 5.79E-01 | 3.03E+00 | 1.06E+00 | 6.73E-01 | 3.04E+00 | 3.29E-09 |
| Europium (63) | Eu-152m | 1.66E+00 | 3.30E-01 | 9.23E-01 | 1.45E+00 | 3.91E-01 | 6.51E+02 | 1.18 | 1.46E+03 | 7.32E+03 | 2.62E+03 | 1.67E+03 | 6.18E+03 | 6.59E-10 |
| Europium (63) | Eu-154 | 7.25E+00 | 1.37E+00 | 3.92E+00 | 6.23E+00 | 1.37E+00 | 7.88E-02 | 1.17 | 5.37E-01 | 2.84E+00 | 9.94E-01 | 6.25E-01 | 2.85E+00 | 2.04E-09 |

| | | Toxicity and Isotope-specific Information | | | | | | | Dose Compliance Concentrations for Radionuclides in Outdoor Surfaces (SDCCs) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Element (Atomic No.) | Radionuclide | Soil Volume External Exposure DCF (Infinite Volume) (mrem/yr per pCi/g) | Soil Volume External Exposure DCF (1 cm) (mrem/yr per pCi/g) | Soil Volume External Exposure DCF (5 cm) (mrem/yr per pCi/g) | External Exposure DCF (15 cm) (mrem/yr per pCi/g) | External Exposure DCF (Ground Plane) (mrem/yr per pCi/cm$^2$) | Lambda | $F_{surf}$ | Soil Volume Soil Volume SDCC (pCi/g) | Soil Volume 1cm SDCC (pCi/g) | Soil Volume 5cm SDCC (pCi/g) | Soil Volume 15cm SDCC (pCi/g) | Ground Plane SDCC (pCi/cm$^2$) | Soil Volume SDCC (mg/kg) |
| Actinium (89) | Ac-223 | 1.98E-02 | 4.81E-03 | 1.31E-02 | 1.87E-02 | 5.16E-03 | 1.66E+05 | 1.46 | 2.51E+07 | 1.03E+08 | 3.79E+07 | 2.66E+07 | 9.61E+07 | 6.55E-08 |
| Europium (63) | Eu-155 | 1.62E-01 | 5.63E-02 | 1.32E-01 | 1.62E-01 | 6.24E-02 | 1.40E-01 | 1.26 | 2.31E+01 | 6.62E+01 | 2.83E+01 | 2.31E+01 | 5.98E+01 | 4.97E-08 |
| Europium (63) | Eu-156 | 8.21E+00 | 1.45E+00 | 4.20E+00 | 6.81E+00 | 1.45E+00 | 1.67E+01 | 1.15 | 7.72E+00 | 4.37E+01 | 1.51E+01 | 9.31E+00 | 4.38E+01 | 1.40E-10 |
| Europium (63) | Eu-157 | 1.22E+00 | 2.78E-01 | 7.50E-01 | 1.12E+00 | 3.22E-01 | 4.01E+02 | 1.22 | 1.18E+03 | 5.18E+03 | 1.92E+03 | 1.29E+03 | 4.47E+03 | 9.00E-10 |
| Europium (63) | Eu-158 | 6.30E+00 | 1.19E+00 | 3.38E+00 | 5.37E+00 | 1.26E+00 | 7.94E+03 | 1.17 | 4.73E+03 | 2.52E+04 | 8.84E+03 | 5.55E+03 | 2.37E+04 | 1.83E-10 |
| Fluorine (9) | F-18 | 5.61E+00 | 1.16E+00 | 3.30E+00 | 5.09E+00 | 1.15E+00 | 3.32E+03 | 1.2 | 2.16E+03 | 1.05E+04 | 3.67E+03 | 2.38E+03 | 1.06E+04 | 2.27E-11 |
| Iron (26) | Fe-52 | 3.86E+00 | 8.32E-01 | 2.35E+00 | 3.56E+00 | 8.30E-01 | 7.34E+02 | 1.21 | 6.90E+02 | 3.20E+03 | 1.13E+03 | 7.47E+02 | 3.21E+03 | 9.48E-11 |
| Iron (26) | Fe-55 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.57E-01 | 0 | | | | | | |
| Iron (26) | Fe-59 | 7.24E+00 | 1.31E+00 | 3.79E+00 | 6.10E+00 | 1.28E+00 | 5.68E+00 | 1.16 | 2.98E+00 | 1.65E+01 | 5.69E+00 | 3.54E+00 | 1.68E+01 | 6.00E-11 |
| Iron (26) | Fe-60 | 9.03E-06 | 5.58E-06 | 8.58E-06 | 9.03E-06 | 1.37E-05 | 6.93E-06 | 1.25 | 3.87E+05 | 6.26E+05 | 4.07E+05 | 3.87E+05 | 2.56E+05 | 6.50E+00 |
| Iron (26) | Fe-60+D | 2.31E-02 | 4.76E-03 | 1.27E-02 | 1.96E-02 | 5.12E-03 | 6.93E-06 | 1.18 | 1.61E+02 | 7.82E+02 | 2.92E+02 | 1.90E+02 | 7.26E+02 | 2.70E-03 |
| Iron (26) | Fe-60+E | 2.31E-02 | 4.76E-03 | 1.27E-02 | 1.96E-02 | 5.12E-03 | 6.93E-06 | | | | | | | |
| Fermium (100) | Fm-252 | 9.42E-05 | 9.25E-05 | 9.42E-05 | 9.42E-05 | 6.31E-04 | 2.67E+02 | 1.38 | 9.01E+06 | 9.18E+06 | 9.01E+06 | 9.01E+06 | 1.34E+06 | 1.65E-05 |
| Fermium (100) | Fm-253 | 2.87E-01 | 8.04E-02 | 2.13E-01 | 2.83E-01 | 8.33E-02 | 8.43E+01 | 1.32 | 9.71E+02 | 3.47E+03 | 1.31E+03 | 9.84E+02 | 3.35E+03 | 5.65E-09 |
| Fermium (100) | Fm-254 | 1.88E-04 | 1.26E-04 | 1.70E-04 | 1.88E-04 | 6.99E-04 | 1.87E+03 | 1.38 | 3.16E+07 | 4.71E+07 | 3.50E+07 | 3.16E+07 | 8.51E+06 | 8.30E-06 |
| Fermium (100) | Fm-255 | 5.22E-03 | 2.31E-03 | 4.40E-03 | 5.18E-03 | 7.34E-03 | 3.02E+02 | 1.4 | 1.82E+05 | 4.10E+05 | 2.16E+05 | 1.83E+05 | 1.29E+05 | 2.97E-07 |
| Fermium (100) | Fm-257 | 3.90E-01 | 1.06E-01 | 2.83E-01 | 3.84E-01 | 1.11E-01 | 2.52E+00 | 1.33 | 2.31E+01 | 8.47E+01 | 3.18E+01 | 2.35E+01 | 8.13E+01 | 4.58E-09 |
| Francium (87) | Fr-219 | 1.81E-02 | 3.92E-03 | 1.11E-02 | 1.67E-02 | 3.85E-03 | 1.04E+09 | 1.22 | 2.06E+11 | 9.52E+11 | 3.36E+11 | 2.23E+11 | 9.68E+11 | 8.42E-08 |
| Francium (87) | Fr-220 | 4.14E-02 | 1.12E-02 | 3.00E-02 | 4.07E-02 | 1.15E-02 | 7.98E+05 | 1.43 | 5.91E+07 | 2.18E+08 | 8.15E+07 | 6.02E+07 | 2.13E+08 | 3.16E-08 |
| Francium (87) | Fr-220+D | 8.99E+00 | 1.51E+00 | 4.38E+00 | 7.22E+00 | 1.52E+00 | 7.98E+05 | 1.14 | 3.41E+05 | 2.04E+06 | 7.00E+05 | 4.25E+05 | 2.02E+06 | 1.83E-10 |
| Francium (87) | Fr-220+E | 8.99E+00 | 1.51E+00 | 4.38E+00 | 7.22E+00 | 1.52E+00 | 7.98E+05 | | | | | | | |
| Francium (87) | Fr-221 | 1.41E-01 | 3.38E-02 | 9.44E-02 | 1.36E-01 | 3.31E-02 | 7.59E+04 | 1.27 | 1.86E+06 | 7.76E+06 | 2.78E+06 | 1.93E+06 | 7.90E+06 | 1.05E-08 |
| Francium (87) | Fr-221+D | 1.12E+00 | 2.37E-01 | 6.68E-01 | 1.01E+00 | 2.81E-01 | 7.59E+04 | 1.17 | 2.53E+05 | 1.20E+06 | 4.27E+05 | 2.81E+05 | 1.01E+06 | 1.43E-09 |
| Francium (87) | Fr-221+E | 1.12E+00 | 2.37E-01 | 6.68E-01 | 1.01E+00 | 2.81E-01 | 7.59E+04 | | | | | | | |
| Francium (87) | Fr-222 | 2.44E-02 | 1.47E-02 | 2.01E-02 | 2.37E-02 | 1.02E-01 | 2.53E+04 | 1.25 | 3.62E+06 | 6.00E+06 | 4.39E+06 | 3.73E+06 | 8.66E+05 | 6.16E-08 |
| Francium (87) | Fr-223 | 1.81E-01 | 5.39E-02 | 1.29E-01 | 1.72E-01 | 9.06E-02 | 1.67E+04 | 1.37 | 2.95E+05 | 9.92E+05 | 4.15E+05 | 3.11E+05 | 5.90E+05 | 7.65E-09 |
| Gallium (31) | Ga-65 | 6.38E+00 | 1.34E+00 | 3.77E+00 | 5.76E+00 | 1.41E+00 | 2.40E+04 | 1.2 | 1.37E+04 | 6.55E+04 | 2.33E+04 | 1.52E+04 | 6.20E+04 | 7.23E-11 |
| Gallium (31) | Ga-66 | 1.57E+01 | 2.67E+00 | 7.70E+00 | 1.26E+01 | 2.63E+00 | 6.46E+02 | 1.14 | 1.58E+02 | 9.30E+02 | 3.22E+02 | 1.96E+02 | 9.45E+02 | 3.13E-11 |
| Gallium (31) | Ga-67 | 6.81E-01 | 1.67E-01 | 4.57E-01 | 6.51E-01 | 1.65E-01 | 7.76E+01 | 1.23 | 4.06E+02 | 1.66E+03 | 6.06E+02 | 4.25E+02 | 1.68E+03 | 6.81E-10 |
| Gallium (31) | Ga-68 | 5.26E+00 | 1.09E+00 | 3.10E+00 | 4.76E+00 | 1.17E+00 | 5.36E+03 | 1.2 | 3.72E+03 | 1.79E+04 | 6.33E+03 | 4.12E+03 | 1.68E+04 | 9.17E-11 |
| Gallium (31) | Ga-70 | 6.21E-02 | 1.92E-02 | 3.88E-02 | 5.56E-02 | 9.90E-02 | 1.72E+04 | 1.17 | 1.04E+06 | 3.36E+06 | 1.66E+06 | 1.16E+06 | 6.52E+05 | 8.19E-09 |
| Gallium (31) | Ga-72 | 1.69E+01 | 2.95E+00 | 8.54E+00 | 1.39E+01 | 2.89E+00 | 4.31E+02 | 1.15 | 9.70E+01 | 5.57E+02 | 1.92E+02 | 1.18E+02 | 5.67E+02 | 3.15E-11 |
| Gallium (31) | Ga-73 | 1.58E+00 | 3.51E-01 | 9.90E-01 | 1.48E+00 | 3.91E-01 | 1.24E+03 | 1.23 | 2.77E+03 | 1.25E+04 | 4.43E+03 | 2.97E+03 | 1.12E+04 | 3.18E-10 |
| Gadolinium (64) | Gd-145 | 1.40E+01 | 2.46E+00 | 7.09E+00 | 1.15E+01 | 2.44E+00 | 1.59E+04 | 1.15 | 4.32E+03 | 2.46E+04 | 8.54E+03 | 5.25E+03 | 2.48E+04 | 7.64E-11 |
| Gadolinium (64) | Gd-146 | 7.18E-01 | 2.26E-01 | 5.46E-01 | 7.11E-01 | 2.59E-01 | 5.24E+00 | 1.26 | 2.55E+01 | 8.12E+01 | 3.35E+01 | 2.58E+01 | 7.07E+01 | 1.38E-09 |
| Gadolinium (64) | Gd-147 | 7.37E+00 | 1.47E+00 | 4.20E+00 | 6.51E+00 | 1.46E+00 | 1.59E+02 | 1.19 | 7.97E+01 | 3.98E+02 | 1.40E+02 | 9.02E+01 | 4.02E+02 | 1.43E-10 |
| Gadolinium (64) | Gd-148 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.45E-03 | 0 | | | | | | |
| Gadolinium (64) | Gd-149 | 2.00E+00 | 4.46E-01 | 1.23E+00 | 1.84E+00 | 4.57E-01 | 2.69E+01 | 1.22 | 4.86E+01 | 2.17E+02 | 7.89E+01 | 5.28E+01 | 2.12E+02 | 5.22E-10 |
| Gadolinium (64) | Gd-151 | 1.55E-01 | 5.02E-02 | 1.13E-01 | 1.51E-01 | 6.50E-02 | 2.11E+00 | 1.27 | 5.35E+01 | 1.65E+02 | 7.32E+01 | 5.52E+01 | 1.28E+02 | 7.44E-09 |
| Gadolinium (64) | Gd-152 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.42E-15 | 0 | | | | | | |
| Gadolinium (64) | Gd-153 | 2.13E-01 | 8.37E-02 | 1.78E-01 | 2.13E-01 | 1.08E-01 | 1.05E+00 | 1.27 | 2.62E+01 | 6.65E+01 | 3.13E+01 | 2.62E+01 | 5.18E+01 | 7.44E-09 |
| Gadolinium (64) | Gd-159 | 2.20E-01 | 5.28E-02 | 1.40E-01 | 2.07E-01 | 7.56E-02 | 3.27E+02 | 1.23 | 5.30E+03 | 2.21E+04 | 8.31E+03 | 5.64E+03 | 1.54E+04 | 5.00E-09 |
| Germanium (32) | Ge-66 | 3.60E+00 | 7.59E-01 | 2.14E+00 | 3.28E+00 | 7.59E-01 | 2.67E+03 | 1.21 | 2.69E+03 | 1.27E+04 | 4.51E+03 | 2.95E+03 | 1.28E+04 | 1.29E-10 |
| Germanium (32) | Ge-67 | 7.85E+00 | 1.62E+00 | 4.55E+00 | 7.01E+00 | 1.70E+00 | 1.95E+04 | 1.19 | 9.11E+03 | 4.42E+04 | 1.57E+04 | 1.02E+04 | 4.20E+04 | 6.08E-11 |
| Germanium (32) | Ge-68 | 1.29E-06 | 1.29E-06 | 1.29E-06 | 1.29E-06 | 4.78E-05 | 8.78E-01 | 1.59 | 3.19E+06 | 3.19E+06 | 3.19E+06 | 3.19E+06 | 8.63E+04 | 4.79E-04 |
| Germanium (32) | Ge-68+D | 5.26E+00 | 1.09E+00 | 3.10E+00 | 4.76E+00 | 1.17E+00 | 8.78E-01 | 1.2 | 1.04E+00 | 5.04E+00 | 1.77E+00 | 1.16E+00 | 4.71E+00 | 1.57E-10 |
| Germanium (32) | Ge-68+E | 5.26E+00 | 1.09E+00 | 3.10E+00 | 4.76E+00 | 1.17E+00 | 8.78E-01 | | | | | | | |
| Germanium (32) | Ge-69 | 5.02E+00 | 9.77E-01 | 2.80E+00 | 4.40E+00 | 9.79E-01 | 1.55E+02 | 1.18 | 1.15E+02 | 5.88E+02 | 2.06E+02 | 1.31E+02 | 5.87E+02 | 9.87E-11 |
| Germanium (32) | Ge-71 | 1.31E-06 | 1.31E-06 | 1.31E-06 | 1.31E-06 | 4.84E-05 | 2.14E+01 | 1.59 | 4.50E+07 | 4.50E+07 | 4.50E+07 | 4.50E+07 | 1.22E+06 | 2.89E-04 |
| Germanium (32) | Ge-75 | 1.76E-01 | 4.18E-02 | 1.14E-01 | 1.67E-01 | 8.40E-02 | 4.40E+03 | 1.23 | 8.94E+04 | 3.77E+05 | 1.38E+05 | 9.41E+04 | 1.87E+05 | 2.96E-09 |

| | | Toxicity and Isotope-specific Information | | | | | | | Dose Compliance Concentrations for Radionuclides in Outdoor Surfaces (SDCCs) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Element (Atomic No.)** | **Radionuclide** | **Soil Volume External Exposure DCF (Infinite Volume) (mrem/yr per pCi/g)** | **Soil Volume External Exposure DCF (1 cm) (mrem/yr per pCi/g)** | **Soil Volume External Exposure DCF (5 cm) (mrem/yr per pCi/g)** | **External Exposure DCF (15 cm) (mrem/yr per pCi/g)** | **External Exposure DCF (Ground Plane) (mrem/yr per pCi/cm$^2$)** | **Lambda** | **$F_{surf}$** | **Soil Volume Soil Volume SDCC (pCi/g)** | **Soil Volume 1cm SDCC (pCi/g)** | **Soil Volume 5cm SDCC (pCi/g)** | **Soil Volume 15cm SDCC (pCi/g)** | **Ground Plane SDCC (pCi/cm$^2$)** | **Soil Volume SDCC (mg/kg)** |
| Actinium (89) | Ac-223 | 1.98E-02 | 4.81E-03 | 1.31E-02 | 1.87E-02 | 5.16E-03 | 1.66E+05 | 1.46 | 2.51E+07 | 1.03E+08 | 3.79E+07 | 2.66E+07 | 9.61E+07 | 6.55E-08 |
| Germanium (32) | Ge-77 | 6.06E+00 | 1.22E+00 | 3.49E+00 | 5.39E+00 | 1.27E+00 | 5.37E+02 | 1.19 | 3.26E+02 | 1.62E+03 | 5.67E+02 | 3.67E+02 | 1.55E+03 | 9.07E-11 |
| Germanium (32) | Ge-78 | 1.40E+00 | 3.11E-01 | 8.90E-01 | 1.32E+00 | 3.12E-01 | 4.19E+03 | 1.22 | 1.07E+04 | 4.81E+04 | 1.69E+04 | 1.14E+04 | 4.81E+04 | 3.89E-10 |
| Hydrogen (1) | H-3 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.61E-02 | 0 | | | | | | |
| Hafnium (72) | Hf-170 | 2.57E+00 | 5.86E-01 | 1.60E+00 | 2.37E+00 | 5.96E-01 | 3.79E+02 | 1.22 | 5.30E+02 | 2.33E+03 | 8.54E+02 | 5.76E+02 | 2.29E+03 | 4.61E-10 |
| Hafnium (72) | Hf-172 | 2.14E-01 | 9.19E-02 | 1.87E-01 | 2.14E-01 | 1.16E-01 | 3.71E-01 | 1.3 | 1.88E+01 | 4.39E+01 | 2.17E+01 | 1.88E+01 | 3.49E+01 | 1.70E-08 |
| Hafnium (72) | Hf-173 | 1.71E+00 | 4.27E-01 | 1.14E+00 | 1.62E+00 | 4.35E-01 | 2.53E+02 | 1.23 | 5.27E+02 | 2.11E+03 | 7.87E+02 | 5.56E+02 | 2.07E+03 | 6.99E-10 |
| Hafnium (72) | Hf-175 | 1.72E+00 | 3.97E-01 | 1.09E+00 | 1.61E+00 | 4.03E-01 | 3.61E+00 | 1.23 | 7.72E+00 | 3.34E+01 | 1.22E+01 | 8.24E+00 | 3.30E+01 | 7.26E-10 |
| Hafnium (72) | Hf-177m | 1.09E+01 | 2.48E+00 | 6.92E+00 | 1.02E+01 | 2.45E+00 | 7.09E+03 | 1.22 | 2.34E+03 | 1.02E+04 | 3.67E+03 | 2.49E+03 | 1.04E+04 | 1.13E-10 |
| Hafnium (72) | Hf-178m | 1.21E+01 | 2.63E+00 | 7.40E+00 | 1.12E+01 | 2.59E+00 | 2.24E-02 | 1.21 | 3.03E-01 | 1.39E+00 | 4.94E-01 | 3.28E-01 | 1.41E+00 | 4.68E-09 |
| Hafnium (72) | Hf-179m | 4.33E+00 | 9.85E-01 | 2.74E+00 | 4.05E+00 | 9.83E-01 | 1.01E+01 | 1.22 | 8.35E+00 | 3.67E+01 | 1.32E+01 | 8.93E+00 | 3.68E+01 | 2.88E-10 |
| Hafnium (72) | Hf-180m | 4.98E+00 | 1.11E+00 | 3.11E+00 | 4.63E+00 | 1.10E+00 | 1.10E+03 | 1.22 | 7.97E+02 | 3.57E+03 | 1.27E+03 | 8.58E+02 | 3.60E+03 | 2.52E-10 |
| Hafnium (72) | Hf-181 | 2.82E+00 | 6.17E-01 | 1.73E+00 | 2.61E+00 | 6.13E-01 | 5.97E+00 | 1.21 | 7.68E+00 | 3.50E+01 | 1.25E+01 | 8.29E+00 | 3.53E+01 | 4.52E-10 |
| Hafnium (72) | Hf-182 | 1.15E+00 | 2.65E-01 | 7.46E-01 | 1.09E+00 | 2.60E-01 | 7.70E-08 | 1.23 | 3.10E+00 | 1.35E+01 | 4.79E+00 | 3.26E+00 | 1.37E+01 | 1.42E-02 |
| Hafnium (72) | Hf-182+D | | | | | | 7.70E-08 | 1.14 | | | | | | |
| Hafnium (72) | Hf-182+E | 8.65E+00 | 1.68E+00 | 4.77E+00 | 7.50E+00 | 1.66E+00 | 7.70E-08 | | | | | | | |
| Hafnium (72) | Hf-182m | 4.81E+00 | 1.03E+00 | 2.89E+00 | 4.36E+00 | 1.02E+00 | 5.92E+03 | 1.2 | 4.48E+03 | 2.10E+04 | 7.45E+03 | 4.94E+03 | 2.10E+04 | 2.67E-10 |
| Hafnium (72) | Hf-183 | 4.14E+00 | 8.37E-01 | 2.37E+00 | 3.67E+00 | 8.78E-01 | 5.69E+03 | 1.19 | 5.07E+03 | 2.51E+04 | 8.87E+03 | 5.72E+03 | 2.39E+04 | 3.16E-10 |
| Hafnium (72) | Hf-184 | 1.10E+00 | 2.65E-01 | 7.27E-01 | 1.05E+00 | 2.87E-01 | 1.47E+03 | 1.25 | 4.71E+03 | 1.95E+04 | 7.11E+03 | 4.94E+03 | 1.80E+04 | 1.14E-09 |
| Mercury (80) | Hg-193 | 7.09E-01 | 2.00E-01 | 5.07E-01 | 6.84E-01 | 2.10E-01 | 1.73E+03 | 1.33 | 8.05E+03 | 2.86E+04 | 1.12E+04 | 8.33E+03 | 2.72E+04 | 1.74E-09 |
| Mercury (80) | Hg-193m | 5.67E+00 | 1.14E+00 | 3.23E+00 | 5.00E+00 | 1.13E+00 | 5.47E+02 | 1.21 | 3.50E+02 | 1.74E+03 | 6.15E+02 | 3.97E+02 | 1.76E+03 | 2.39E-10 |
| Mercury (80) | Hg-194 | 1.06E-05 | 1.06E-05 | 1.06E-05 | 1.06E-05 | 2.61E-04 | 2.67E-03 | 1.53 | 2.69E+05 | 2.69E+05 | 2.69E+05 | 2.69E+05 | 1.10E+04 | 3.80E-02 |
| Mercury (80) | Hg-194+D | 6.15E+00 | 1.16E+00 | 3.30E+00 | 5.24E+00 | 1.13E+00 | 2.67E-03 | 1.18 | 6.04E-01 | 3.22E+00 | 1.13E+00 | 7.10E-01 | 3.28E+00 | 8.54E-08 |
| Mercury (80) | Hg-194+E | 6.15E+00 | 1.16E+00 | 3.30E+00 | 5.24E+00 | 1.13E+00 | 2.67E-03 | | | | | | | |
| Mercury (80) | Hg-195 | 9.23E-01 | 2.09E-01 | 5.60E-01 | 8.26E-01 | 2.16E-01 | 6.13E+02 | 1.28 | 2.28E+03 | 1.01E+04 | 3.76E+03 | 2.54E+03 | 9.73E+03 | 1.40E-09 |
| Mercury (80) | Hg-195m | 9.70E-01 | 2.24E-01 | 6.14E-01 | 9.01E-01 | 2.25E-01 | 1.46E+02 | 1.31 | 5.04E+02 | 2.18E+03 | 7.96E+02 | 5.42E+02 | 2.17E+03 | 1.31E-09 |
| Mercury (80) | Hg-197 | 1.50E-01 | 5.99E-02 | 1.31E-01 | 1.50E-01 | 6.76E-02 | 9.47E+01 | 1.4 | 1.97E+03 | 4.94E+03 | 2.26E+03 | 1.97E+03 | 4.38E+03 | 7.97E-09 |
| Mercury (80) | Hg-197m | 3.19E-01 | 9.23E-02 | 2.37E-01 | 3.13E-01 | 9.48E-02 | 2.55E+02 | 1.35 | 2.59E+03 | 8.94E+03 | 3.49E+03 | 2.64E+03 | 8.71E+03 | 3.88E-09 |
| Mercury (80) | Hg-199m | 7.35E-01 | 1.92E-01 | 5.11E-01 | 7.09E-01 | 1.95E-01 | 8.55E+03 | 1.3 | 3.93E+04 | 1.50E+05 | 5.65E+04 | 4.08E+04 | 1.48E+05 | 1.78E-09 |
| Mercury (80) | Hg-203 | 1.17E+00 | 2.65E-01 | 7.48E-01 | 1.10E+00 | 2.59E-01 | 5.43E+00 | 1.24 | 1.65E+01 | 7.28E+01 | 2.58E+01 | 1.75E+01 | 7.44E+01 | 1.20E-09 |
| Holmium (67) | Ho-155 | 1.92E+00 | 4.21E-01 | 1.17E+00 | 1.76E+00 | 4.54E-01 | 7.59E+03 | 1.21 | 1.43E+04 | 6.52E+04 | 2.36E+04 | 1.56E+04 | 6.05E+04 | 5.67E-10 |
| Holmium (67) | Ho-157 | 2.33E+00 | 5.17E-01 | 1.41E+00 | 2.11E+00 | 5.38E-01 | 2.89E+04 | 1.21 | 4.48E+04 | 2.02E+05 | 7.39E+04 | 4.96E+04 | 1.94E+05 | 4.72E-10 |
| Holmium (67) | Ho-159 | 1.47E+00 | 3.69E-01 | 9.68E-01 | 1.38E+00 | 3.90E-01 | 1.10E+04 | 1.23 | 2.68E+04 | 1.06E+05 | 4.06E+04 | 2.85E+04 | 1.01E+05 | 7.49E-10 |
| Holmium (67) | Ho-161 | 7.50E-02 | 3.92E-02 | 6.84E-02 | 7.48E-02 | 6.00E-02 | 2.43E+03 | 1.29 | 1.10E+05 | 2.11E+05 | 1.21E+05 | 1.11E+05 | 1.38E+05 | 1.42E-08 |
| Holmium (67) | Ho-162 | 7.57E-01 | 1.65E-01 | 4.36E-01 | 6.62E-01 | 1.81E-01 | 2.43E+04 | 1.2 | 1.17E+05 | 5.35E+05 | 2.02E+05 | 1.33E+05 | 4.88E+05 | 1.51E-09 |
| Holmium (67) | Ho-162m | 3.08E+00 | 6.12E-01 | 1.71E+00 | 2.67E+00 | 6.19E-01 | 5.36E+03 | 1.18 | 6.44E+03 | 3.24E+04 | 1.16E+04 | 7.44E+03 | 3.21E+04 | 3.78E-10 |
| Holmium (67) | Ho-164 | 3.80E-02 | 2.09E-02 | 3.58E-02 | 3.80E-02 | 3.94E-02 | 1.26E+04 | 1.27 | 1.14E+06 | 2.08E+06 | 1.21E+06 | 1.14E+06 | 1.10E+06 | 2.89E-08 |
| Holmium (67) | Ho-164m | 5.02E-02 | 3.00E-02 | 4.87E-02 | 5.02E-02 | 4.55E-02 | 9.71E+03 | 1.27 | 6.68E+05 | 1.12E+06 | 6.88E+05 | 6.68E+05 | 7.36E+05 | 2.19E-08 |
| Holmium (67) | Ho-166 | 1.56E-01 | 4.10E-02 | 9.27E-02 | 1.35E-01 | 1.23E-01 | 2.27E+02 | 1.19 | 5.37E+03 | 2.04E+04 | 9.03E+03 | 6.20E+03 | 6.83E+03 | 7.64E-09 |
| Holmium (67) | Ho-166m | 9.64E+00 | 1.94E+00 | 5.56E+00 | 8.60E+00 | 1.93E+00 | 5.78E-04 | 1.19 | 3.82E-01 | 1.90E+00 | 6.62E-01 | 4.28E-01 | 1.91E+00 | 2.13E-07 |
| Holmium (67) | Ho-167 | 1.83E+00 | 4.07E-01 | 1.15E+00 | 1.71E+00 | 4.10E-01 | 1.96E+03 | 1.22 | 3.84E+03 | 1.73E+04 | 6.15E+03 | 4.11E+03 | 1.72E+04 | 6.36E-10 |
| Iodine (53) | I-120 | 1.66E+01 | 3.02E+00 | 8.67E+00 | 1.39E+01 | 3.06E+00 | 4.50E+03 | 1.16 | 1.02E+03 | 5.61E+03 | 1.95E+03 | 1.22E+03 | 5.54E+03 | 5.29E-11 |
| Iodine (53) | I-120m | 3.17E+01 | 5.87E+00 | 1.69E+01 | 2.70E+01 | 5.85E+00 | 6.87E+03 | 1.17 | 8.14E+02 | 4.39E+03 | 1.53E+03 | 9.54E+02 | 4.41E+03 | 2.76E-11 |
| Iodine (53) | I-121 | 2.07E+00 | 4.51E-01 | 1.28E+00 | 1.92E+00 | 4.62E-01 | 2.86E+03 | 1.23 | 4.93E+03 | 2.26E+04 | 8.01E+03 | 5.32E+03 | 2.21E+04 | 4.05E-10 |
| Iodine (53) | I-122 | 5.28E+00 | 1.10E+00 | 3.10E+00 | 4.76E+00 | 1.19E+00 | 1.01E+05 | 1.2 | 6.96E+04 | 3.35E+05 | 1.19E+05 | 7.73E+04 | 3.09E+05 | 1.64E-10 |
| Iodine (53) | I-123 | 6.51E-01 | 1.67E-01 | 4.49E-01 | 6.30E-01 | 1.79E-01 | 4.60E+02 | 1.27 | 2.44E+03 | 9.53E+03 | 3.53E+03 | 2.52E+03 | 8.90E+03 | 1.27E-09 |
| Iodine (53) | I-124 | 6.38E+00 | 1.21E+00 | 3.47E+00 | 5.50E+00 | 1.21E+00 | 6.05E+01 | 1.18 | 3.52E+01 | 1.86E+02 | 6.46E+01 | 4.08E+01 | 1.85E+02 | 1.40E-10 |
| Iodine (53) | I-125 | 1.19E-02 | 1.10E-02 | 1.19E-02 | 1.19E-02 | 3.66E-02 | 4.21E+00 | 1.31 | 1.21E+03 | 1.31E+03 | 1.21E+03 | 1.21E+03 | 3.91E+02 | 6.96E-08 |
| Iodine (53) | I-126 | 2.46E+00 | 5.05E-01 | 1.44E+00 | 2.22E+00 | 5.16E-01 | 1.94E+01 | 1.21 | 2.87E+01 | 1.40E+02 | 4.91E+01 | 3.18E+01 | 1.37E+02 | 3.61E-10 |
| Iodine (53) | I-128 | 4.81E-01 | 1.11E-01 | 2.93E-01 | 4.40E-01 | 2.00E-01 | 1.46E+04 | 1.21 | 1.10E+05 | 4.75E+05 | 1.80E+05 | 1.20E+05 | 2.64E+05 | 1.87E-09 |

| | | Toxicity and Isotope-specific Information | | | | | | | Dose Compliance Concentrations for Radionuclides in Outdoor Surfaces (SDCCs) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Element (Atomic No.)** | **Radionuclide** | **Soil Volume External Exposure DCF (Infinite Volume) (mrem/yr per pCi/g)** | **Soil Volume External Exposure DCF (1 cm) (mrem/yr per pCi/g)** | **Soil Volume External Exposure DCF (5 cm) (mrem/yr per pCi/g)** | **External Exposure DCF (15 cm) (mrem/yr per pCi/g)** | **External Exposure DCF (Ground Plane) (mrem/yr per pCi/cm$^2$)** | **Lambda** | **$F_{surf}$** | **Soil Volume Soil Volume SDCC (pCi/g)** | **Soil Volume 1cm SDCC (pCi/g)** | **Soil Volume 5cm SDCC (pCi/g)** | **Soil Volume 15cm SDCC (pCi/g)** | **Ground Plane SDCC (pCi/cm$^2$)** | **Soil Volume SDCC (mg/kg)** |
| Actinium (89) | Ac-223 | 1.98E-02 | 4.81E-03 | 1.31E-02 | 1.87E-02 | 5.16E-03 | 1.66E+05 | 1.46 | 2.51E+07 | 1.03E+08 | 3.79E+07 | 2.66E+07 | 9.61E+07 | 6.55E-08 |
| Iodine (53) | I-129 | 9.53E-03 | 8.21E-03 | 9.53E-03 | 9.53E-03 | 2.28E-02 | 4.41E-08 | 1.3 | 3.54E+02 | 4.12E+02 | 3.54E+02 | 3.54E+02 | 1.48E+02 | 2.01E+00 |
| Iodine (53) | I-130 | 1.21E+01 | 2.41E+00 | 6.90E+00 | 1.08E+01 | 2.39E+00 | 4.91E+02 | 1.19 | 1.49E+02 | 7.53E+02 | 2.62E+02 | 1.68E+02 | 7.57E+02 | 7.67E-11 |
| Iodine (53) | I-131 | 2.01E+00 | 4.31E-01 | 1.22E+00 | 1.85E+00 | 4.25E-01 | 3.15E+01 | 1.21 | 5.65E+01 | 2.64E+02 | 9.30E+01 | 6.14E+01 | 2.68E+02 | 4.56E-10 |
| Iodine (53) | I-132 | 1.32E+01 | 2.56E+00 | 7.35E+00 | 1.16E+01 | 2.57E+00 | 2.64E+03 | 1.18 | 7.41E+02 | 3.84E+03 | 1.33E+03 | 8.47E+02 | 3.82E+03 | 7.19E-11 |
| Iodine (53) | I-132m | 1.75E+00 | 3.54E-01 | 1.01E+00 | 1.56E+00 | 3.63E-01 | 4.36E+03 | 1.2 | 9.05E+03 | 4.47E+04 | 1.57E+04 | 1.01E+04 | 4.37E+04 | 5.32E-10 |
| Iodine (53) | I-133 | 3.41E+00 | 6.88E-01 | 1.96E+00 | 3.04E+00 | 7.20E-01 | 2.92E+02 | 1.19 | 3.14E+02 | 1.56E+03 | 5.48E+02 | 3.53E+02 | 1.49E+03 | 2.78E-10 |
| Iodine (53) | I-134 | 1.55E+01 | 2.93E+00 | 8.43E+00 | 1.34E+01 | 2.95E+00 | 6.92E+03 | 1.17 | 1.67E+03 | 8.85E+03 | 3.07E+03 | 1.94E+03 | 8.77E+03 | 6.28E-11 |
| Iodine (53) | I-135 | 9.72E+00 | 1.73E+00 | 5.00E+00 | 8.11E+00 | 1.72E+00 | 9.18E+02 | 1.15 | 3.59E+02 | 2.02E+03 | 6.98E+02 | 4.30E+02 | 2.03E+03 | 1.02E-10 |
| Indium (49) | In-109 | 3.62E+00 | 7.29E-01 | 2.09E+00 | 3.23E+00 | 7.28E-01 | 1.45E+03 | 1.21 | 1.45E+03 | 7.18E+03 | 2.51E+03 | 1.62E+03 | 7.19E+03 | 2.12E-10 |
| Indium (49) | In-110 | 1.76E+01 | 3.39E+00 | 9.75E+00 | 1.54E+01 | 3.36E+00 | 1.24E+03 | | | | | | | |
| Indium (49) | In-110m | 8.95E+00 | 1.75E+00 | 4.98E+00 | 7.83E+00 | 1.79E+00 | 5.27E+03 | | | | | | | |
| Indium (49) | In-111 | 1.81E+00 | 4.29E-01 | 1.20E+00 | 1.74E+00 | 4.29E-01 | 8.94E+01 | 1.26 | 1.72E+02 | 7.25E+02 | 2.59E+02 | 1.79E+02 | 7.25E+02 | 4.15E-10 |
| Indium (49) | In-112 | 1.45E+00 | 3.00E-01 | 8.50E-01 | 1.31E+00 | 3.20E-01 | 2.53E+04 | 1.22 | 6.29E+04 | 3.04E+05 | 1.07E+05 | 6.95E+04 | 2.85E+05 | 5.41E-10 |
| Indium (49) | In-113m | 1.33E+00 | 2.85E-01 | 8.13E-01 | 1.23E+00 | 2.84E-01 | 3.66E+03 | 1.23 | 9.83E+03 | 4.59E+04 | 1.61E+04 | 1.06E+04 | 4.62E+04 | 5.89E-10 |
| Indium (49) | In-114 | 1.68E-02 | 3.04E-03 | 8.73E-03 | 1.41E-02 | 3.22E-03 | 3.04E+05 | 1.19 | 6.69E+07 | 3.70E+08 | 1.29E+08 | 7.98E+07 | 3.49E+08 | 4.87E-08 |
| Indium (49) | In-114m | 4.51E-01 | 9.70E-02 | 2.72E-01 | 4.12E-01 | 1.01E-01 | 5.11E+00 | 1.25 | 3.99E+01 | 1.86E+02 | 6.61E+01 | 4.37E+01 | 1.79E+02 | 1.73E-09 |
| Indium (49) | In-114m+D | 4.68E-01 | 1.00E-01 | 2.80E-01 | 4.25E-01 | 1.04E-01 | 5.11E+00 | 1 | 4.79E+01 | 2.24E+02 | 8.02E+01 | 5.27E+01 | 2.16E+02 | 2.07E-09 |
| Indium (49) | In-114m+E | 4.68E-01 | 1.00E-01 | 2.80E-01 | 4.25E-01 | 1.04E-01 | 5.11E+00 | | | | | | | |
| Indium (49) | In-115 | 3.54E-04 | 1.30E-04 | 2.83E-04 | 3.51E-04 | 4.17E-04 | 1.36E-16 | 1.25 | 1.21E+04 | 3.29E+04 | 1.51E+04 | 1.22E+04 | 1.03E+04 | 1.98E+10 |
| Indium (49) | In-115m | 7.93E-01 | 1.74E-01 | 4.94E-01 | 7.40E-01 | 1.76E-01 | 1.35E+03 | 1.24 | 6.02E+03 | 2.74E+04 | 9.66E+03 | 6.45E+03 | 2.71E+04 | 9.93E-10 |
| Indium (49) | In-116m | 1.52E+01 | 2.70E+00 | 7.85E+00 | 1.27E+01 | 2.66E+00 | 6.73E+03 | 1.16 | 1.68E+03 | 9.43E+03 | 3.25E+03 | 2.01E+03 | 9.59E+03 | 5.62E-11 |
| Indium (49) | In-117 | 3.64E+00 | 7.76E-01 | 2.20E+00 | 3.34E+00 | 7.75E-01 | 8.32E+03 | 1.21 | 8.30E+03 | 3.89E+04 | 1.37E+04 | 9.05E+03 | 3.90E+04 | 2.27E-10 |
| Indium (49) | In-117m | 4.29E-01 | 1.02E-01 | 2.80E-01 | 4.07E-01 | 1.46E-01 | 3.13E+03 | 1.25 | 2.55E+04 | 1.07E+05 | 3.91E+04 | 2.69E+04 | 7.50E+04 | 1.85E-09 |
| Indium (49) | In-119 | 4.42E+00 | 8.71E-01 | 2.48E+00 | 3.90E+00 | 9.36E-01 | 1.52E+05 | 1.19 | 1.27E+05 | 6.44E+05 | 2.26E+05 | 1.44E+05 | 5.99E+05 | 1.93E-10 |
| Indium (49) | In-119m | 9.03E-02 | 3.73E-02 | 6.30E-02 | 8.37E-02 | 1.52E-01 | 2.02E+04 | 1.3 | 7.58E+05 | 1.83E+06 | 1.09E+06 | 8.17E+05 | 4.51E+05 | 8.65E-09 |
| Iridium (77) | Ir-182 | 7.35E+00 | 1.52E+00 | 4.27E+00 | 6.56E+00 | 1.56E+00 | 2.43E+04 | 1.2 | 1.21E+04 | 5.85E+04 | 2.08E+04 | 1.35E+04 | 5.67E+04 | 1.75E-10 |
| Iridium (77) | Ir-184 | 1.08E+01 | 2.09E+00 | 5.97E+00 | 9.36E+00 | 2.08E+00 | 2.01E+03 | 1.19 | 6.86E+02 | 3.55E+03 | 1.24E+03 | 7.92E+02 | 3.57E+03 | 1.22E-10 |
| Iridium (77) | Ir-185 | 3.34E+00 | 6.25E-01 | 1.76E+00 | 2.80E+00 | 6.22E-01 | 4.34E+02 | 1.21 | 4.71E+02 | 2.52E+03 | 8.94E+02 | 5.62E+02 | 2.53E+03 | 3.90E-10 |
| Iridium (77) | Ir-186 | 9.25E+00 | 1.79E+00 | 5.11E+00 | 8.00E+00 | 1.76E+00 | 3.84E+02 | | | | | | | |
| Iridium (77) | Ir-186m | 5.28E+00 | 1.06E+00 | 3.00E+00 | 4.64E+00 | 1.07E+00 | 3.47E+03 | | | | | | | |
| Iridium (77) | Ir-187 | 1.79E+00 | 3.88E-01 | 1.06E+00 | 1.60E+00 | 3.93E-01 | 5.78E+02 | 1.24 | 1.14E+03 | 5.26E+03 | 1.92E+03 | 1.27E+03 | 5.18E+03 | 7.15E-10 |
| Iridium (77) | Ir-188 | 9.55E+00 | 1.70E+00 | 4.89E+00 | 7.89E+00 | 1.66E+00 | 1.46E+02 | 1.16 | 5.77E+01 | 3.25E+02 | 1.13E+02 | 6.99E+01 | 3.33E+02 | 1.44E-10 |
| Iridium (77) | Ir-189 | 2.18E-01 | 7.31E-02 | 1.70E-01 | 2.14E-01 | 8.16E-02 | 1.90E+01 | 1.38 | 2.76E+02 | 8.24E+02 | 3.56E+02 | 2.81E+02 | 7.39E+02 | 5.33E-09 |
| Iridium (77) | Ir-190 | 7.53E+00 | 1.60E+00 | 4.51E+00 | 6.86E+00 | 1.59E+00 | 2.09E+01 | 1.22 | 1.00E+01 | 4.70E+01 | 1.67E+01 | 1.10E+01 | 4.75E+01 | 1.76E-10 |
| Iridium (77) | Ir-190m | 2.05E-06 | 2.05E-06 | 2.05E-06 | 2.05E-06 | 6.21E-05 | 5.06E+03 | 1.56 | 6.91E+09 | 6.91E+09 | 6.91E+09 | 6.91E+09 | 2.28E+08 | 5.04E-04 |
| Iridium (77) | Ir-190n | 8.15E+00 | 1.73E+00 | 4.90E+00 | 7.46E+00 | 1.72E+00 | 1.96E+03 | 1.22 | 8.65E+02 | 4.07E+03 | 1.44E+03 | 9.45E+02 | 4.11E+03 | 1.63E-10 |
| Iridium (77) | Ir-191m | 2.05E-01 | 6.86E-02 | 1.63E-01 | 2.03E-01 | 7.39E-02 | 4.42E+06 | 1.4 | 6.77E+07 | 2.02E+08 | 8.51E+07 | 6.83E+07 | 1.88E+08 | 5.67E-09 |
| Iridium (77) | Ir-192 | 4.27E+00 | 9.19E-01 | 2.63E+00 | 3.95E+00 | 9.07E-01 | 3.42E+00 | 1.21 | 2.99E+00 | 1.39E+01 | 4.85E+00 | 3.23E+00 | 1.41E+01 | 3.26E-10 |
| Iridium (77) | Ir-192m | 6.86E-01 | 1.75E-01 | 4.81E-01 | 6.71E-01 | 1.72E-01 | 2.88E-03 | 1.24 | 5.16E+00 | 2.03E+01 | 7.36E+00 | 5.28E+00 | 2.07E+01 | 6.69E-07 |
| Iridium (77) | Ir-194 | 5.24E-01 | 1.19E-01 | 3.13E-01 | 4.74E-01 | 2.11E-01 | 3.17E+02 | 1.2 | 2.21E+03 | 9.73E+03 | 3.70E+03 | 2.45E+03 | 5.49E+03 | 2.63E-09 |
| Iridium (77) | Ir-194m | 1.27E+01 | 2.63E+00 | 7.52E+00 | 1.15E+01 | 2.60E+00 | 1.48E+00 | 1.2 | 5.49E-01 | 2.65E+00 | 9.29E-01 | 6.05E-01 | 2.68E+00 | 1.40E-10 |
| Iridium (77) | Ir-195 | 1.46E-01 | 5.37E-02 | 1.21E-01 | 1.45E-01 | 8.60E-02 | 2.43E+03 | 1.39 | 5.23E+04 | 1.42E+05 | 6.33E+04 | 5.27E+04 | 8.90E+04 | 8.15E-09 |
| Iridium (77) | Ir-195m | 2.00E+00 | 4.51E-01 | 1.24E+00 | 1.84E+00 | 4.64E-01 | 1.60E+03 | 1.33 | 2.64E+03 | 1.17E+04 | 4.24E+03 | 2.87E+03 | 1.13E+04 | 6.25E-10 |
| Potassium (19) | K-38 | 2.00E+01 | 3.47E+00 | 1.00E+01 | 1.64E+01 | 3.47E+00 | 4.77E+04 | 1.15 | 9.12E+03 | 5.25E+04 | 1.81E+04 | 1.11E+04 | 5.25E+04 | 1.41E-11 |
| Potassium (19) | K-40 | 9.94E-01 | 1.77E-01 | 5.04E-01 | 8.21E-01 | 2.38E-01 | 5.41E-10 | 1.15 | 3.84E+00 | 2.16E+01 | 7.59E+00 | 4.66E+00 | 1.61E+01 | 5.51E-01 |
| Potassium (19) | K-42 | 1.84E+00 | 3.49E-01 | 9.42E-01 | 1.52E+00 | 4.64E-01 | 4.91E+02 | 1.14 | 1.03E+03 | 5.40E+03 | 2.00E+03 | 1.24E+03 | 4.05E+03 | 1.70E-10 |
| Potassium (19) | K-43 | 5.32E+00 | 1.10E+00 | 3.13E+00 | 4.83E+00 | 1.10E+00 | 2.69E+02 | 1.2 | 1.85E+02 | 8.93E+02 | 3.13E+02 | 2.03E+02 | 8.94E+02 | 5.73E-11 |
| Potassium (19) | K-44 | 1.47E+01 | 2.46E+00 | 7.11E+00 | 1.17E+01 | 2.47E+00 | 1.65E+04 | 1.13 | 4.33E+03 | 2.59E+04 | 8.96E+03 | 5.42E+03 | 2.57E+04 | 2.24E-11 |
| Potassium (19) | K-45 | 1.18E+01 | 2.01E+00 | 5.86E+00 | 9.59E+00 | 2.05E+00 | 1.82E+04 | 1.14 | 5.92E+03 | 3.48E+04 | 1.20E+04 | 7.31E+03 | 3.41E+04 | 2.84E-11 |

| | | Toxicity and Isotope-specific Information | | | | | | | Dose Compliance Concentrations for Radionuclides in Outdoor Surfaces (SDCCs) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Element (Atomic No.)** | **Radionuclide** | **Soil Volume External Exposure DCF (Infinite Volume) (mrem/yr per pCi/g)** | **Soil Volume External Exposure DCF (1 cm) (mrem/yr per pCi/g)** | **Soil Volume External Exposure DCF (5 cm) (mrem/yr per pCi/g)** | **External Exposure DCF (15 cm) (mrem/yr per pCi/g)** | **External Exposure DCF (Ground Plane) (mrem/yr per pCi/cm$^2$)** | **Lambda** | **$F_{surf}$** | **Soil Volume Soil Volume SDCC (pCi/g)** | **Soil Volume 1cm SDCC (pCi/g)** | **Soil Volume 5cm SDCC (pCi/g)** | **Soil Volume 15cm SDCC (pCi/g)** | **Ground Plane SDCC (pCi/cm$^2$)** | **Soil Volume SDCC (mg/kg)** |
| Actinium (89) | Ac-223 | 1.98E-02 | 4.81E-03 | 1.31E-02 | 1.87E-02 | 5.16E-03 | 1.66E+05 | 1.46 | 2.51E+07 | 1.03E+08 | 3.79E+07 | 2.66E+07 | 9.61E+07 | 6.55E-08 |
| Krypton (36) | Kr-74 | 6.19E+00 | 1.33E+00 | 3.73E+00 | 5.67E+00 | 1.40E+00 | 3.17E+04 | 1.21 | 1.85E+04 | 8.62E+04 | 3.07E+04 | 2.02E+04 | 8.17E+04 | 8.38E-11 |
| Krypton (36) | Kr-76 | 2.18E+00 | 4.76E-01 | 1.35E+00 | 2.03E+00 | 4.70E-01 | 4.10E+02 | 1.29 | 6.37E+02 | 2.92E+03 | 1.03E+03 | 6.84E+02 | 2.96E+03 | 2.29E-10 |
| Krypton (36) | Kr-77 | 5.32E+00 | 1.15E+00 | 3.25E+00 | 4.89E+00 | 1.21E+00 | 4.88E+03 | 1.22 | 3.30E+03 | 1.52E+04 | 5.40E+03 | 3.59E+03 | 1.44E+04 | 1.01E-10 |
| Krypton (36) | Kr-79 | 1.36E+00 | 2.83E-01 | 8.08E-01 | 1.24E+00 | 2.79E-01 | 1.73E+02 | 1.3 | 4.31E+02 | 2.06E+03 | 7.24E+02 | 4.73E+02 | 2.10E+03 | 3.81E-10 |
| Krypton (36) | Kr-81 | 2.76E-02 | 6.23E-03 | 1.77E-02 | 2.63E-02 | 6.99E-03 | 3.30E-06 | 1.51 | 1.05E+02 | 4.67E+02 | 1.65E+02 | 1.11E+02 | 4.16E+02 | 5.02E-03 |
| Krypton (36) | Kr-81m | 5.84E-01 | 1.41E-01 | 3.95E-01 | 5.65E-01 | 1.38E-01 | 1.68E+06 | 1.3 | 9.68E+06 | 4.00E+07 | 1.43E+07 | 1.00E+07 | 4.10E+07 | 9.05E-10 |
| Krypton (36) | Kr-83m | 2.52E-05 | 2.44E-05 | 2.52E-05 | 2.52E-05 | 4.17E-04 | 3.32E+03 | 1.49 | 3.87E+08 | 3.98E+08 | 3.87E+08 | 3.87E+08 | 2.34E+07 | 1.88E-05 |
| Krypton (36) | Kr-85 | 1.35E-02 | 3.08E-03 | 8.21E-03 | 1.23E-02 | 1.23E-02 | 6.46E-02 | 1.2 | 2.80E+02 | 1.22E+03 | 4.59E+02 | 3.06E+02 | 3.08E+02 | 7.13E-07 |
| Krypton (36) | Kr-85m | 6.96E-01 | 1.73E-01 | 4.77E-01 | 6.73E-01 | 1.83E-01 | 1.36E+03 | 1.26 | 6.79E+03 | 2.73E+04 | 9.89E+03 | 7.01E+03 | 2.58E+04 | 8.26E-10 |
| Krypton (36) | Kr-87 | 5.02E+00 | 8.95E-01 | 2.54E+00 | 4.12E+00 | 9.80E-01 | 4.77E+03 | 1.15 | 3.63E+03 | 2.03E+04 | 7.18E+03 | 4.42E+03 | 1.86E+04 | 1.28E-10 |
| Krypton (36) | Kr-88 | 1.26E+01 | 2.07E+00 | 6.06E+00 | 1.01E+01 | 2.02E+00 | 2.14E+03 | 1.14 | 6.54E+02 | 3.98E+03 | 1.36E+03 | 8.21E+02 | 4.09E+03 | 5.23E-11 |
| Lanthanum (57) | La-131 | 3.47E+00 | 7.39E-01 | 2.07E+00 | 3.17E+00 | 7.64E-01 | 6.17E+03 | 1.21 | 6.43E+03 | 3.02E+04 | 1.08E+04 | 7.04E+03 | 2.92E+04 | 2.65E-10 |
| Lanthanum (57) | La-132 | 1.19E+01 | 2.22E+00 | 6.36E+00 | 1.01E+01 | 2.22E+00 | 1.26E+03 | 1.17 | 3.97E+02 | 2.13E+03 | 7.43E+02 | 4.67E+02 | 2.13E+03 | 8.04E-11 |
| Lanthanum (57) | La-134 | 3.84E+00 | 8.02E-01 | 2.26E+00 | 3.47E+00 | 8.75E-01 | 5.46E+04 | 1.2 | 5.18E+04 | 2.48E+05 | 8.83E+04 | 5.74E+04 | 2.28E+05 | 2.47E-10 |
| Lanthanum (57) | La-135 | 6.77E-02 | 2.09E-02 | 4.42E-02 | 6.21E-02 | 3.55E-02 | 3.11E+02 | 1.28 | 1.57E+04 | 5.10E+04 | 2.41E+04 | 1.72E+04 | 3.00E+04 | 1.32E-08 |
| Lanthanum (57) | La-137 | 1.04E-02 | 8.82E-03 | 1.04E-02 | 1.04E-02 | 2.29E-02 | 1.16E-05 | 1.29 | 3.25E+02 | 3.84E+02 | 3.25E+02 | 3.25E+02 | 1.48E+02 | 7.48E-03 |
| Lanthanum (57) | La-138 | 7.53E+00 | 1.34E+00 | 3.90E+00 | 6.30E+00 | 1.32E+00 | 5.13E-12 | 1.16 | 5.02E-01 | 2.81E+00 | 9.70E-01 | 6.00E-01 | 2.87E+00 | 2.62E+01 |
| Lanthanum (57) | La-140 | 1.43E+01 | 2.54E+00 | 7.33E+00 | 1.19E+01 | 2.52E+00 | 1.51E+02 | 1.15 | 4.01E+01 | 2.26E+02 | 7.81E+01 | 4.82E+01 | 2.27E+02 | 7.23E-11 |
| Lanthanum (57) | La-141 | 3.10E-01 | 7.11E-02 | 1.70E-01 | 2.61E-01 | 1.77E-01 | 1.54E+03 | 1.15 | 1.90E+04 | 8.29E+04 | 3.48E+04 | 2.26E+04 | 3.32E+04 | 3.37E-09 |
| Lanthanum (57) | La-142 | 1.78E+01 | 2.93E+00 | 8.56E+00 | 1.42E+01 | 2.91E+00 | 3.94E+03 | 1.13 | 8.55E+02 | 5.20E+03 | 1.78E+03 | 1.07E+03 | 5.24E+03 | 5.98E-11 |
| Lanthanum (57) | La-143 | 6.64E-01 | 1.45E-01 | 3.58E-01 | 5.58E-01 | 2.65E-01 | 2.56E+04 | 1.15 | 1.47E+05 | 6.71E+05 | 2.72E+05 | 1.75E+05 | 3.68E+05 | 1.59E-09 |
| Lutetium (71) | Lu-169 | 5.89E+00 | 1.12E+00 | 3.17E+00 | 5.02E+00 | 1.12E+00 | 1.78E+02 | 1.17 | 1.13E+02 | 5.96E+02 | 2.10E+02 | 1.33E+02 | 5.98E+02 | 2.08E-10 |
| Lutetium (71) | Lu-170 | 1.56E+01 | 2.63E+00 | 7.65E+00 | 1.26E+01 | 2.56E+00 | 1.26E+02 | 1.17 | 3.04E+01 | 1.80E+02 | 6.20E+01 | 3.77E+01 | 1.86E+02 | 7.92E-11 |
| Lutetium (71) | Lu-171 | 3.62E+00 | 7.50E-01 | 2.09E+00 | 3.21E+00 | 7.63E-01 | 3.08E+01 | 1.2 | 3.11E+01 | 1.50E+02 | 5.38E+01 | 3.50E+01 | 1.47E+02 | 3.35E-10 |
| Lutetium (71) | Lu-172 | 1.08E+01 | 2.07E+00 | 5.89E+00 | 9.33E+00 | 2.05E+00 | 3.78E+01 | 1.17 | 1.30E+01 | 6.81E+01 | 2.39E+01 | 1.51E+01 | 6.86E+01 | 1.15E-10 |
| Lutetium (71) | Lu-173 | 3.75E-01 | 1.17E-01 | 2.72E-01 | 3.60E-01 | 1.35E-01 | 5.06E-01 | 1.25 | 1.19E+01 | 3.81E+01 | 1.64E+01 | 1.24E+01 | 3.30E+01 | 7.90E-09 |
| Lutetium (71) | Lu-174 | 5.35E-01 | 1.20E-01 | 3.08E-01 | 4.61E-01 | 1.31E-01 | 2.09E-01 | 1.2 | 7.56E+00 | 3.36E+01 | 1.31E+01 | 8.78E+00 | 3.10E+01 | 1.22E-08 |
| Lutetium (71) | Lu-174m | 1.29E-01 | 4.94E-02 | 1.01E-01 | 1.23E-01 | 6.22E-02 | 1.78E+00 | 1.29 | 5.64E+01 | 1.47E+02 | 7.18E+01 | 5.92E+01 | 1.17E+02 | 1.07E-08 |
| Lutetium (71) | Lu-176 | 2.33E+00 | 5.39E-01 | 1.51E+00 | 2.22E+00 | 5.33E-01 | 1.93E-11 | 1.23 | 1.53E+00 | 6.62E+00 | 2.36E+00 | 1.61E+00 | 6.69E+00 | 2.71E+01 |
| Lutetium (71) | Lu-176m | 3.90E-02 | 1.67E-02 | 3.32E-02 | 3.90E-02 | 6.54E-02 | 1.65E+03 | 1.3 | 1.43E+05 | 3.35E+05 | 1.68E+05 | 1.43E+05 | 8.53E+04 | 2.96E-08 |
| Lutetium (71) | Lu-177 | 1.45E-01 | 3.71E-02 | 1.01E-01 | 1.41E-01 | 3.75E-02 | 3.77E+01 | 1.24 | 9.17E+02 | 3.58E+03 | 1.32E+03 | 9.45E+02 | 3.55E+03 | 8.35E-09 |
| Lutetium (71) | Lu-177m | 4.61E+00 | 1.09E+00 | 3.00E+00 | 4.36E+00 | 1.09E+00 | 1.57E+00 | 1.23 | 1.54E+00 | 6.51E+00 | 2.36E+00 | 1.62E+00 | 6.51E+00 | 3.36E-10 |
| Lutetium (71) | Lu-178 | 8.50E-01 | 1.66E-01 | 4.51E-01 | 7.16E-01 | 2.51E-01 | 1.28E+04 | 1.16 | 5.69E+04 | 2.91E+05 | 1.07E+05 | 6.76E+04 | 1.93E+05 | 1.53E-09 |
| Lutetium (71) | Lu-178m | 5.39E+00 | 1.23E+00 | 3.43E+00 | 5.05E+00 | 1.26E+00 | 1.60E+04 | 1.22 | 1.07E+04 | 4.69E+04 | 1.68E+04 | 1.14E+04 | 4.57E+04 | 2.30E-10 |
| Lutetium (71) | Lu-179 | 1.54E-01 | 3.90E-02 | 1.02E-01 | 1.47E-01 | 8.95E-02 | 1.32E+03 | 1.23 | 3.07E+04 | 1.21E+05 | 4.62E+04 | 3.22E+04 | 5.27E+04 | 8.06E-09 |
| Mendelevium (101) | Md-257 | 4.61E-01 | 1.16E-01 | 3.15E-01 | 4.42E-01 | 1.18E-01 | 1.17E+03 | 1.29 | 8.58E+03 | 3.40E+04 | 1.25E+04 | 8.95E+03 | 3.36E+04 | 3.67E-09 |
| Mendelevium (101) | Md-258 | 1.86E-03 | 1.04E-03 | 1.68E-03 | 1.86E-03 | 3.87E-03 | 4.60E+00 | 1.37 | 7.99E+03 | 1.43E+04 | 8.82E+03 | 7.99E+03 | 3.83E+03 | 8.70E-07 |
| Magnesium (12) | Mg-28 | 8.15E+00 | 1.50E+00 | 4.31E+00 | 6.92E+00 | 1.47E+00 | 2.90E+02 | 1.17 | 1.34E+02 | 7.28E+02 | 2.53E+02 | 1.57E+02 | 7.40E+02 | 2.50E-11 |
| Manganese (25) | Mn-51 | 5.52E+00 | 1.15E+00 | 3.25E+00 | 5.00E+00 | 1.25E+00 | 7.88E+03 | 1.2 | 5.21E+03 | 2.50E+04 | 8.87E+03 | 5.76E+03 | 2.30E+04 | 6.54E-11 |
| Manganese (25) | Mn-52 | 2.07E+01 | 3.82E+00 | 1.10E+01 | 1.77E+01 | 3.76E+00 | 4.52E+01 | 1.17 | 8.22E+00 | 4.45E+01 | 1.54E+01 | 9.63E+00 | 4.53E+01 | 1.83E-11 |
| Manganese (25) | Mn-52m | 1.44E+01 | 2.70E+00 | 7.74E+00 | 1.23E+01 | 2.75E+00 | 1.73E+04 | 1.17 | 4.50E+03 | 2.39E+04 | 8.36E+03 | 5.25E+03 | 2.35E+04 | 2.63E-11 |
| Manganese (25) | Mn-53 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.87E-07 | 0 | | | | | | |
| Manganese (25) | Mn-54 | 4.85E+00 | 9.36E-01 | 2.69E+00 | 4.23E+00 | 9.23E-01 | 8.09E-01 | 1.18 | 1.12E+00 | 5.80E+00 | 2.02E+00 | 1.28E+00 | 5.88E+00 | 1.45E-10 |
| Manganese (25) | Mn-56 | 1.05E+01 | 1.87E+00 | 5.37E+00 | 8.73E+00 | 1.89E+00 | 2.35E+03 | 1.15 | 8.52E+02 | 4.80E+03 | 1.67E+03 | 1.02E+03 | 4.73E+03 | 3.93E-11 |
| Molybdenum (42) | Mo-101 | 8.24E+00 | 1.51E+00 | 4.35E+00 | 6.98E+00 | 1.53E+00 | 2.49E+04 | 1.16 | 1.14E+04 | 6.21E+04 | 2.16E+04 | 1.35E+04 | 6.14E+04 | 8.95E-11 |
| Molybdenum (42) | Mo-90 | 4.29E+00 | 9.06E-01 | 2.57E+00 | 3.90E+00 | 9.08E-01 | 1.07E+03 | 1.24 | 8.84E+02 | 4.18E+03 | 1.47E+03 | 9.73E+02 | 4.18E+03 | 1.44E-10 |
| Molybdenum (42) | Mo-93 | 4.16E-04 | 4.18E-04 | 4.16E-04 | 4.16E-04 | 4.53E-03 | 1.98E-04 | 1.4 | 7.55E+03 | 7.52E+03 | 7.55E+03 | 7.55E+03 | 6.93E+02 | 6.88E-03 |
| Molybdenum (42) | Mo-93m | 1.36E+01 | 2.48E+00 | 7.14E+00 | 1.15E+01 | 2.42E+00 | 8.86E+02 | 1.17 | 2.46E+02 | 1.34E+03 | 4.66E+02 | 2.90E+02 | 1.38E+03 | 5.00E-11 |
| Molybdenum (42) | Mo-99 | 8.34E-01 | 1.71E-01 | 4.81E-01 | 7.44E-01 | 2.08E-01 | 9.20E+01 | 1.2 | 4.03E+02 | 1.97E+03 | 6.99E+02 | 4.52E+02 | 1.62E+03 | 8.42E-10 |

| | | Toxicity and Isotope-specific Information | | | | | | | Dose Compliance Concentrations for Radionuclides in Outdoor Surfaces (SDCCs) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Element (Atomic No.)** | **Radionuclide** | **Soil Volume External Exposure DCF (Infinite Volume) (mrem/yr per pCi/g)** | **Soil Volume External Exposure DCF (1 cm) (mrem/yr per pCi/g)** | **Soil Volume External Exposure DCF (5 cm) (mrem/yr per pCi/g)** | **External Exposure DCF (15 cm) (mrem/yr per pCi/g)** | **External Exposure DCF (Ground Plane) (mrem/yr per pCi/cm$^2$)** | **Lambda** | **$F_{surf}$** | **Soil Volume Soil Volume SDCC (pCi/g)** | **Soil Volume 1cm SDCC (pCi/g)** | **Soil Volume 5cm SDCC (pCi/g)** | **Soil Volume 15cm SDCC (pCi/g)** | **Ground Plane SDCC (pCi/cm$^2$)** | **Soil Volume SDCC (mg/kg)** |
| Actinium (89) | Ac-223 | 1.98E-02 | 4.81E-03 | 1.31E-02 | 1.87E-02 | 5.16E-03 | 1.66E+05 | 1.46 | 2.51E+07 | 1.03E+08 | 3.79E+07 | 2.66E+07 | 9.61E+07 | 6.55E-08 |
| Nitrogen (7) | N-13 | 5.61E+00 | 1.16E+00 | 3.30E+00 | 5.09E+00 | 1.20E+00 | 3.66E+04 | 1.2 | 2.38E+04 | 1.15E+05 | 4.04E+04 | 2.62E+04 | 1.11E+05 | 1.64E-11 |
| Sodium (11) | Na-22 | 1.29E+01 | 2.44E+00 | 7.01E+00 | 1.11E+01 | 2.39E+00 | 2.66E-01 | 1.17 | 3.30E-01 | 1.74E+00 | 6.07E-01 | 3.82E-01 | 1.78E+00 | 5.29E-11 |
| Sodium (11) | Na-24 | 2.72E+01 | 4.33E+00 | 1.27E+01 | 2.13E+01 | 4.19E+00 | 4.05E+02 | 1.12 | 5.81E+01 | 3.65E+02 | 1.25E+02 | 7.44E+01 | 3.77E+02 | 6.68E-12 |
| Niobium (41) | Nb-88 | 2.37E+01 | 4.64E+00 | 1.33E+01 | 2.09E+01 | 4.69E+00 | 2.55E+04 | 1.19 | 3.97E+03 | 2.03E+04 | 7.09E+03 | 4.50E+03 | 2.01E+04 | 2.66E-11 |
| Niobium (41) | Nb-89 | 8.32E+00 | 1.56E+00 | 4.46E+00 | 7.09E+00 | 1.62E+00 | 2.99E+03 | | | | | | | |
| Niobium (41) | Nb-89m | 1.07E+01 | 2.20E+00 | 6.25E+00 | 9.64E+00 | 2.26E+00 | 5.52E+03 | | | | | | | |
| Niobium (41) | Nb-90 | 2.65E+01 | 4.53E+00 | 1.32E+01 | 2.14E+01 | 4.42E+00 | 4.16E+02 | 1.15 | 5.97E+01 | 3.49E+02 | 1.20E+02 | 7.38E+01 | 3.58E+02 | 2.51E-11 |
| Niobium (41) | Nb-93m | 7.35E-05 | 7.35E-05 | 7.35E-05 | 7.35E-05 | 7.96E-04 | 5.10E-02 | 1.4 | 4.38E+04 | 4.38E+04 | 4.38E+04 | 4.38E+04 | 4.05E+03 | 1.55E-04 |
| Niobium (41) | Nb-94 | 9.10E+00 | 1.77E+00 | 5.07E+00 | 7.98E+00 | 1.74E+00 | 3.41E-05 | 1.18 | 4.08E-01 | 2.10E+00 | 7.32E-01 | 4.65E-01 | 2.14E+00 | 2.18E-06 |
| Niobium (41) | Nb-95 | 4.42E+00 | 8.62E-01 | 2.46E+00 | 3.88E+00 | 8.50E-01 | 7.20E+00 | 1.18 | 6.04E+00 | 3.10E+01 | 1.08E+01 | 6.89E+00 | 3.14E+01 | 1.55E-10 |
| Niobium (41) | Nb-95m | 2.93E-01 | 6.79E-02 | 1.92E-01 | 2.82E-01 | 6.90E-02 | 7.01E+01 | 1.34 | 7.85E+02 | 3.39E+03 | 1.20E+03 | 8.17E+02 | 3.33E+03 | 2.07E-09 |
| Niobium (41) | Nb-96 | 1.44E+01 | 2.78E+00 | 7.94E+00 | 1.25E+01 | 2.73E+00 | 2.60E+02 | 1.18 | 6.74E+01 | 3.48E+02 | 1.22E+02 | 7.72E+01 | 3.54E+02 | 4.83E-11 |
| Niobium (41) | Nb-97 | 3.73E+00 | 7.46E-01 | 2.13E+00 | 3.32E+00 | 7.88E-01 | 5.05E+03 | 1.19 | 4.99E+03 | 2.50E+04 | 8.76E+03 | 5.61E+03 | 2.36E+04 | 1.86E-10 |
| Niobium (41) | Nb-97m | 4.18E+00 | 8.21E-01 | 2.35E+00 | 3.69E+00 | 8.11E-01 | 3.64E+05 | 1.18 | 3.23E+05 | 1.64E+06 | 5.73E+05 | 3.65E+05 | 1.66E+06 | 1.67E-10 |
| Niobium (41) | Nb-98 | 1.44E+01 | 2.72E+00 | 7.80E+00 | 1.24E+01 | 2.77E+00 | 7.07E+03 | 1.17 | 1.83E+03 | 9.72E+03 | 3.40E+03 | 2.13E+03 | 9.57E+03 | 4.93E-11 |
| Neodymium (60) | Nd-136 | 1.28E+00 | 2.95E-01 | 7.93E-01 | 1.17E+00 | 3.19E-01 | 7.19E+03 | 1.23 | 2.00E+04 | 8.70E+04 | 3.24E+04 | 2.19E+04 | 8.05E+04 | 7.36E-10 |
| Neodymium (60) | Nd-138 | 8.77E-02 | 2.89E-02 | 6.17E-02 | 8.36E-02 | 4.38E-02 | 1.20E+03 | 1.27 | 4.73E+04 | 1.43E+05 | 6.71E+04 | 4.96E+04 | 9.47E+04 | 1.05E-08 |
| Neodymium (60) | Nd-139 | 2.16E+00 | 4.46E-01 | 1.25E+00 | 1.94E+00 | 4.75E-01 | 1.23E+04 | 1.2 | 2.06E+04 | 1.00E+05 | 3.56E+04 | 2.30E+04 | 9.40E+04 | 4.54E-10 |
| Neodymium (60) | Nd-139m | 8.90E+00 | 1.73E+00 | 4.92E+00 | 7.74E+00 | 1.73E+00 | 1.10E+03 | 1.18 | 4.60E+02 | 2.37E+03 | 8.31E+02 | 5.29E+02 | 2.37E+03 | 1.12E-10 |
| Neodymium (60) | Nd-141 | 2.87E-01 | 6.55E-02 | 1.67E-01 | 2.54E-01 | 7.98E-02 | 2.44E+03 | 1.24 | 3.00E+04 | 1.32E+05 | 5.15E+04 | 3.40E+04 | 1.08E+05 | 3.37E-09 |
| Neodymium (60) | Nd-141m | 4.36E+00 | 8.54E-01 | 2.44E+00 | 3.84E+00 | 8.54E-01 | 3.50E+05 | 1.18 | 2.97E+05 | 1.52E+06 | 5.31E+05 | 3.38E+05 | 1.52E+06 | 2.32E-10 |
| Neodymium (60) | Nd-147 | 6.17E-01 | 1.45E-01 | 3.88E-01 | 5.69E-01 | 1.63E-01 | 2.30E+01 | 1.22 | 1.34E+02 | 5.70E+02 | 2.13E+02 | 1.45E+02 | 5.05E+02 | 1.65E-09 |
| Neodymium (60) | Nd-149 | 1.90E+00 | 4.25E-01 | 1.18E+00 | 1.76E+00 | 4.74E-01 | 3.51E+03 | 1.22 | 6.64E+03 | 2.97E+04 | 1.07E+04 | 7.18E+03 | 2.67E+04 | 5.47E-10 |
| Neodymium (60) | Nd-151 | 5.13E+00 | 1.02E+00 | 2.89E+00 | 4.49E+00 | 1.08E+00 | 2.93E+04 | 1.18 | 2.12E+04 | 1.07E+05 | 3.76E+04 | 2.42E+04 | 1.01E+05 | 2.12E-10 |
| Neon (10) | Ne-19 | 5.65E+00 | 1.18E+00 | 3.34E+00 | 5.13E+00 | 1.28E+00 | 1.27E+06 | 1.2 | 8.20E+05 | 3.92E+06 | 1.39E+06 | 9.03E+05 | 3.61E+06 | 2.38E-11 |
| Nickel (28) | Ni-56 | 9.68E+00 | 1.92E+00 | 5.48E+00 | 8.54E+00 | 1.89E+00 | 4.15E+01 | 1.18 | 1.58E+01 | 7.99E+01 | 2.80E+01 | 1.80E+01 | 8.11E+01 | 4.15E-11 |
| Nickel (28) | Ni-57 | 1.17E+01 | 2.11E+00 | 6.08E+00 | 9.83E+00 | 2.05E+00 | 1.68E+02 | 1.16 | 5.43E+01 | 3.02E+02 | 1.05E+02 | 6.48E+01 | 3.10E+02 | 3.57E-11 |
| Nickel (28) | Ni-59 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 9.24E-06 | 0 | | | | | | |
| Nickel (28) | Ni-63 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.22E-03 | 0 | | | | | | |
| Nickel (28) | Ni-65 | 3.41E+00 | 6.12E-01 | 1.76E+00 | 2.85E+00 | 6.64E-01 | 2.41E+03 | 1.15 | 2.68E+03 | 1.50E+04 | 5.21E+03 | 3.21E+03 | 1.38E+04 | 1.41E-10 |
| Nickel (28) | Ni-66 | 3.64E-05 | 1.77E-05 | 3.23E-05 | 3.62E-05 | 3.30E-05 | 1.11E+02 | 1.25 | 1.07E+07 | 2.19E+07 | 1.20E+07 | 1.07E+07 | 1.18E+07 | 1.23E-05 |
| Neptunium (93) | Np-232 | 6.58E+00 | 1.33E+00 | 3.77E+00 | 5.84E+00 | 1.32E+00 | 2.48E+04 | 1.22 | 1.36E+04 | 6.73E+04 | 2.37E+04 | 1.53E+04 | 6.77E+04 | 2.46E-10 |
| Neptunium (93) | Np-233 | 2.95E-01 | 8.77E-02 | 2.24E-01 | 2.91E-01 | 9.09E-02 | 1.01E+04 | 1.35 | 1.11E+05 | 3.72E+05 | 1.46E+05 | 1.12E+05 | 3.59E+05 | 4.97E-09 |
| Neptunium (93) | Np-234 | 8.77E+00 | 1.56E+00 | 4.49E+00 | 7.27E+00 | 1.53E+00 | 5.75E+01 | 1.18 | 2.44E+01 | 1.38E+02 | 4.76E+01 | 2.94E+01 | 1.40E+02 | 1.93E-10 |
| Neptunium (93) | Np-235 | 2.82E-03 | 1.07E-03 | 2.29E-03 | 2.82E-03 | 3.34E-03 | 6.39E-01 | 1.42 | 1.48E+03 | 3.89E+03 | 1.82E+03 | 1.48E+03 | 1.25E+03 | 1.06E-06 |
| Neptunium (93) | Np-236 | 4.16E-01 | 1.22E-01 | 3.15E-01 | 4.12E-01 | 1.30E-01 | 6.03E-06 | | | | | | | |
| Neptunium (93) | Np-236m | 1.72E-01 | 4.87E-02 | 1.25E-01 | 1.66E-01 | 5.11E-02 | 2.70E+02 | | | | | | | |
| Neptunium (93) | Np-237 | 6.94E-02 | 2.31E-02 | 5.52E-02 | 6.92E-02 | 2.94E-02 | 3.24E-07 | 1.4 | 4.52E+01 | 1.35E+02 | 5.68E+01 | 4.53E+01 | 1.07E+02 | 6.41E-02 |
| Neptunium (93) | Np-237+D | | | | | | 3.24E-07 | 1.25 | | | | | | |
| Neptunium (93) | Np-237+E | 1.01E+00 | 2.41E-01 | 6.66E-01 | 9.59E-01 | 2.46E-01 | 3.24E-07 | | | | | | | |
| Neptunium (93) | Np-238 | 3.25E+00 | 6.10E-01 | 1.75E+00 | 2.80E+00 | 6.23E-01 | 1.19E+02 | 1.2 | 1.35E+02 | 7.18E+02 | 2.50E+02 | 1.57E+02 | 7.03E+02 | 5.22E-10 |
| Neptunium (93) | Np-239 | 6.88E-01 | 1.77E-01 | 4.79E-01 | 6.66E-01 | 1.80E-01 | 1.07E+02 | 1.32 | 5.19E+02 | 2.02E+03 | 7.45E+02 | 5.36E+02 | 1.99E+03 | 2.24E-09 |
| Neptunium (93) | Np-240 | 7.25E+00 | 1.45E+00 | 4.12E+00 | 6.42E+00 | 1.45E+00 | 5.60E+03 | 1.22 | 2.77E+03 | 1.39E+04 | 4.88E+03 | 3.13E+03 | 1.39E+04 | 2.30E-10 |
| Neptunium (93) | Np-240m | 1.90E+00 | 3.80E-01 | 1.07E+00 | 1.68E+00 | 4.52E-01 | 4.92E+04 | 1.23 | 9.18E+04 | 4.59E+05 | 1.63E+05 | 1.04E+05 | 3.87E+05 | 8.69E-10 |
| Oxygen (8) | O-15 | 5.61E+00 | 1.17E+00 | 3.32E+00 | 5.09E+00 | 1.25E+00 | 1.79E+05 | 1.2 | 1.16E+05 | 5.58E+05 | 1.97E+05 | 1.28E+05 | 5.23E+05 | 1.89E-11 |
| Osmium (76) | Os-180 | 1.41E-01 | 5.22E-02 | 1.13E-01 | 1.36E-01 | 6.29E-02 | 1.66E+04 | 1.39 | 3.71E+05 | 1.00E+06 | 4.64E+05 | 3.83E+05 | 8.31E+05 | 7.82E-09 |
| Osmium (76) | Os-181 | 6.75E+00 | 1.33E+00 | 3.77E+00 | 5.87E+00 | 1.32E+00 | 3.47E+03 | 1.19 | 1.89E+03 | 9.58E+03 | 3.38E+03 | 2.17E+03 | 9.66E+03 | 1.91E-10 |
| Osmium (76) | Os-182 | 2.07E+00 | 4.70E-01 | 1.29E+00 | 1.92E+00 | 4.74E-01 | 2.76E+02 | 1.25 | 4.69E+02 | 2.07E+03 | 7.51E+02 | 5.05E+02 | 2.05E+03 | 6.00E-10 |
| Osmium (76) | Os-185 | 3.90E+00 | 7.96E-01 | 2.24E+00 | 3.47E+00 | 7.95E-01 | 2.69E+00 | 1.2 | 2.70E+00 | 1.32E+01 | 4.70E+00 | 3.03E+00 | 1.32E+01 | 3.60E-10 |

| | | Toxicity and Isotope-specific Information | | | | | | | Dose Compliance Concentrations for Radionuclides in Outdoor Surfaces (SDCCs) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Element (Atomic No.)** | **Radionuclide** | **Soil Volume External Exposure DCF (Infinite Volume) (mrem/yr per pCi/g)** | **Soil Volume External Exposure DCF (1 cm) (mrem/yr per pCi/g)** | **Soil Volume External Exposure DCF (5 cm) (mrem/yr per pCi/g)** | **External Exposure DCF (15 cm) (mrem/yr per pCi/g)** | **External Exposure DCF (Ground Plane) (mrem/yr per pCi/cm$^2$)** | **Lambda** | **$F_{surf}$** | **Soil Volume Soil Volume SDCC (pCi/g)** | **Soil Volume 1cm SDCC (pCi/g)** | **Soil Volume 5cm SDCC (pCi/g)** | **Soil Volume 15cm SDCC (pCi/g)** | **Ground Plane SDCC (pCi/cm$^2$)** | **Soil Volume SDCC (mg/kg)** |
| Actinium (89) | Ac-223 | 1.98E-02 | 4.81E-03 | 1.31E-02 | 1.87E-02 | 5.16E-03 | 1.66E+05 | 1.46 | 2.51E+07 | 1.03E+08 | 3.79E+07 | 2.66E+07 | 9.61E+07 | 6.55E-08 |
| Osmium (76) | Os-189m | 1.76E-06 | 1.76E-06 | 1.76E-06 | 1.76E-06 | 5.64E-05 | 1.01E+03 | 1.58 | 1.60E+09 | 1.60E+09 | 1.60E+09 | 1.60E+09 | 4.99E+07 | 5.78E-04 |
| Osmium (76) | Os-190m | 8.50E+00 | 1.78E+00 | 5.09E+00 | 7.76E+00 | 1.76E+00 | 3.68E+04 | 1.21 | 1.57E+04 | 7.46E+04 | 2.62E+04 | 1.72E+04 | 7.56E+04 | 1.57E-10 |
| Osmium (76) | Os-191 | 2.14E-01 | 7.27E-02 | 1.72E-01 | 2.13E-01 | 7.88E-02 | 1.64E+01 | 1.39 | 2.41E+02 | 7.11E+02 | 3.01E+02 | 2.43E+02 | 6.57E+02 | 5.44E-09 |
| Osmium (76) | Os-191m | 1.38E-02 | 6.21E-03 | 1.26E-02 | 1.38E-02 | 7.47E-03 | 4.66E+02 | 1.49 | 9.89E+04 | 2.20E+05 | 1.09E+05 | 9.89E+04 | 1.83E+05 | 7.87E-08 |
| Osmium (76) | Os-193 | 3.41E-01 | 8.11E-02 | 2.18E-01 | 3.17E-01 | 1.12E-01 | 2.02E+02 | 1.25 | 2.07E+03 | 8.72E+03 | 3.24E+03 | 2.23E+03 | 6.32E+03 | 3.84E-09 |
| Osmium (76) | Os-194 | 9.31E-04 | 6.17E-04 | 9.18E-04 | 9.31E-04 | 1.11E-03 | 1.16E-01 | 1.52 | 3.28E+03 | 4.95E+03 | 3.33E+03 | 3.28E+03 | 2.74E+03 | 1.07E-05 |
| Osmium (76) | Os-194+D | 5.24E-01 | 1.20E-01 | 3.13E-01 | 4.74E-01 | 2.12E-01 | 1.16E-01 | 1.2 | 7.41E+00 | 3.24E+01 | 1.24E+01 | 8.19E+00 | 1.83E+01 | 2.41E-08 |
| Osmium (76) | Os-194+E | 5.24E-01 | 1.20E-01 | 3.13E-01 | 4.74E-01 | 2.12E-01 | 1.16E-01 | | | | | | | |
| Phosphorus (15) | P-30 | 5.69E+00 | 1.21E+00 | 3.38E+00 | 5.17E+00 | 1.32E+00 | 1.46E+05 | 1.2 | 9.35E+04 | 4.41E+05 | 1.58E+05 | 1.03E+05 | 4.03E+05 | 3.74E-11 |
| Phosphorus (15) | P-32 | 2.03E-02 | 1.24E-02 | 1.69E-02 | 1.98E-02 | 9.94E-02 | 1.77E+01 | 1.25 | 3.04E+03 | 4.99E+03 | 3.66E+03 | 3.13E+03 | 6.22E+02 | 1.07E-08 |
| Phosphorus (15) | P-33 | 5.02E-05 | 2.37E-05 | 4.40E-05 | 5.00E-05 | 4.25E-05 | 9.96E+00 | 1.25 | 6.93E+05 | 1.47E+06 | 7.90E+05 | 6.96E+05 | 8.19E+05 | 4.46E-06 |
| Protactinium (91) | Pa-227 | 5.65E-02 | 1.92E-02 | 4.61E-02 | 5.65E-02 | 2.11E-02 | 9.51E+03 | 1.39 | 5.29E+05 | 1.56E+06 | 6.49E+05 | 5.29E+05 | 1.41E+06 | 2.45E-08 |
| Protactinium (91) | Pa-228 | 6.38E+00 | 1.24E+00 | 3.54E+00 | 5.54E+00 | 1.23E+00 | 2.76E+02 | 1.23 | 1.55E+02 | 7.93E+02 | 2.78E+02 | 1.78E+02 | 8.05E+02 | 2.48E-10 |
| Protactinium (91) | Pa-230 | 3.56E+00 | 7.14E-01 | 2.03E+00 | 3.13E+00 | 7.08E-01 | 1.45E+01 | 1.23 | 1.46E+01 | 7.27E+01 | 2.55E+01 | 1.66E+01 | 7.33E+01 | 4.48E-10 |
| Protactinium (91) | Pa-231 | 1.76E-01 | 4.03E-02 | 1.12E-01 | 1.66E-01 | 4.41E-02 | 2.12E-05 | 1.4 | 1.78E+01 | 7.77E+01 | 2.79E+01 | 1.89E+01 | 7.09E+01 | 3.77E-04 |
| Protactinium (91) | Pa-232 | 5.35E+00 | 1.04E+00 | 2.98E+00 | 4.68E+00 | 1.03E+00 | 1.93E+02 | 1.2 | 1.31E+02 | 6.76E+02 | 2.36E+02 | 1.50E+02 | 6.83E+02 | 3.06E-10 |
| Protactinium (91) | Pa-233 | 9.40E-01 | 2.18E-01 | 6.10E-01 | 8.90E-01 | 2.17E-01 | 9.37E+00 | 1.29 | 3.38E+01 | 1.46E+02 | 5.21E+01 | 3.57E+01 | 1.46E+02 | 1.63E-09 |
| Protactinium (91) | Pa-234 | 1.09E+01 | 2.11E+00 | 6.04E+00 | 9.47E+00 | 2.10E+00 | 9.06E+02 | 1.21 | 3.02E+02 | 1.56E+03 | 5.43E+02 | 3.46E+02 | 1.56E+03 | 1.51E-10 |
| Protactinium (91) | Pa-234m | 9.85E-02 | 3.13E-02 | 6.21E-02 | 8.80E-02 | 1.26E-01 | 3.11E+05 | 1.19 | 1.16E+07 | 3.64E+07 | 1.84E+07 | 1.30E+07 | 9.06E+06 | 1.69E-08 |
| Lead (82) | Pb-195m | 8.67E+00 | 1.78E+00 | 5.04E+00 | 7.78E+00 | 1.77E+00 | 2.31E+04 | 1.22 | 9.54E+03 | 4.65E+04 | 1.64E+04 | 1.06E+04 | 4.66E+04 | 1.57E-10 |
| Lead (82) | Pb-198 | 2.05E+00 | 4.74E-01 | 1.31E+00 | 1.92E+00 | 4.74E-01 | 2.53E+03 | 1.27 | 4.25E+03 | 1.84E+04 | 6.67E+03 | 4.53E+03 | 1.84E+04 | 6.45E-10 |
| Lead (82) | Pb-199 | 8.56E+00 | 1.61E+00 | 4.61E+00 | 7.31E+00 | 1.59E+00 | 4.05E+03 | 1.19 | 1.75E+03 | 9.28E+03 | 3.24E+03 | 2.04E+03 | 9.42E+03 | 1.67E-10 |
| Lead (82) | Pb-200 | 7.63E-01 | 2.11E-01 | 5.46E-01 | 7.39E-01 | 2.17E-01 | 2.82E+02 | 1.35 | 1.20E+03 | 4.34E+03 | 1.67E+03 | 1.24E+03 | 4.21E+03 | 1.65E-09 |
| Lead (82) | Pb-201 | 3.99E+00 | 8.34E-01 | 2.35E+00 | 3.58E+00 | 8.26E-01 | 6.46E+02 | 1.23 | 5.79E+02 | 2.77E+03 | 9.83E+02 | 6.45E+02 | 2.79E+03 | 3.49E-10 |
| Lead (82) | Pb-202 | 7.33E-06 | 7.33E-06 | 7.33E-06 | 7.33E-06 | 2.23E-04 | 2.31E-06 | 1.57 | 3.80E+05 | 3.80E+05 | 3.80E+05 | 3.80E+05 | 1.25E+04 | 6.44E+01 |
| Lead (82) | Pb-202+D | 1.40E+01 | | | | | 2.31E-06 | 1.23 | 2.54E-01 | | | | | 4.31E-05 |
| Lead (82) | Pb-202+E | 2.33E+00 | 5.15E-01 | 1.43E+00 | 2.14E+00 | 5.13E-01 | 2.31E-06 | | | | | | | |
| Lead (82) | Pb-202m | 1.17E+01 | 2.29E+00 | 6.56E+00 | 1.03E+01 | 2.25E+00 | 1.68E+03 | 1.19 | 5.30E+02 | 2.70E+03 | 9.42E+02 | 6.02E+02 | 2.75E+03 | 1.24E-10 |
| Lead (82) | Pb-203 | 1.38E+00 | 3.34E-01 | 9.12E-01 | 1.31E+00 | 3.34E-01 | 1.17E+02 | 1.29 | 2.87E+02 | 1.18E+03 | 4.34E+02 | 3.02E+02 | 1.18E+03 | 9.69E-10 |
| Lead (82) | Pb-205 | 8.19E-06 | 8.19E-06 | 8.19E-06 | 8.19E-06 | 2.43E-04 | 4.85E-08 | 1.57 | 3.40E+05 | 3.40E+05 | 3.40E+05 | 3.40E+05 | 1.15E+04 | 2.79E+03 |
| Lead (82) | Pb-209 | 7.52E-04 | 2.95E-04 | 5.95E-04 | 7.40E-04 | 3.72E-03 | 1.87E+03 | 1.25 | 8.67E+06 | 2.21E+07 | 1.10E+07 | 8.80E+06 | 1.75E+06 | 1.88E-06 |
| Lead (82) | Pb-210 | 1.98E-03 | 1.26E-03 | 1.96E-03 | 1.98E-03 | 2.49E-03 | 3.11E-02 | 1.5 | 1.50E+03 | 2.35E+03 | 1.52E+03 | 1.50E+03 | 1.19E+03 | 1.97E-05 |
| Lead (82) | Pb-211 | 2.91E-01 | 6.17E-02 | 1.69E-01 | 2.59E-01 | 1.11E-01 | 1.01E+04 | 1.19 | 1.27E+05 | 6.00E+05 | 2.19E+05 | 1.43E+05 | 3.34E+05 | 5.16E-09 |
| Lead (82) | Pb-212 | 6.45E-01 | 1.59E-01 | 4.36E-01 | 6.21E-01 | 1.58E-01 | 5.71E+02 | 1.29 | 3.01E+03 | 1.22E+04 | 4.45E+03 | 3.13E+03 | 1.23E+04 | 2.17E-09 |
| Lead (82) | Pb-214 | 1.24E+00 | 2.78E-01 | 7.80E-01 | 1.16E+00 | 2.80E-01 | 1.36E+04 | 1.25 | 3.85E+04 | 1.72E+05 | 6.12E+04 | 4.11E+04 | 1.70E+05 | 1.18E-09 |
| Palladium (46) | Pd-100 | 2.89E-01 | 1.04E-01 | 2.41E-01 | 2.89E-01 | 1.24E-01 | 6.97E+01 | 1.32 | 7.98E+02 | 2.21E+03 | 9.59E+02 | 7.98E+02 | 1.86E+03 | 2.22E-09 |
| Palladium (46) | Pd-101 | 1.74E+00 | 3.52E-01 | 1.01E+00 | 1.55E+00 | 3.61E-01 | 7.34E+02 | 1.26 | 1.47E+03 | 7.26E+03 | 2.55E+03 | 1.65E+03 | 7.10E+03 | 3.94E-10 |
| Palladium (46) | Pd-103 | 1.88E-03 | 1.43E-03 | 1.66E-03 | 1.84E-03 | 8.95E-03 | 1.49E+01 | 1.35 | 2.57E+04 | 3.38E+04 | 2.92E+04 | 2.64E+04 | 5.41E+03 | 3.45E-07 |
| Palladium (46) | Pd-107 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.07E-07 | 0 | | | | | | |
| Palladium (46) | Pd-109 | 1.80E-02 | 7.22E-03 | 1.41E-02 | 1.75E-02 | 4.35E-02 | 4.52E+02 | 1.33 | 8.28E+04 | 2.06E+05 | 1.05E+05 | 8.48E+04 | 3.42E+04 | 3.87E-08 |
| Promethium (61) | Pm-141 | 4.18E+00 | 8.43E-01 | 2.39E+00 | 3.71E+00 | 9.02E-01 | 1.74E+04 | 1.19 | 1.54E+04 | 7.61E+04 | 2.69E+04 | 1.73E+04 | 7.11E+04 | 2.41E-10 |
| Promethium (61) | Pm-142 | 4.89E+00 | 1.03E+00 | 2.85E+00 | 4.40E+00 | 1.12E+00 | 5.40E+05 | 1.2 | 4.04E+05 | 1.92E+06 | 6.92E+05 | 4.49E+05 | 1.76E+06 | 2.06E-10 |
| Promethium (61) | Pm-143 | 1.66E+00 | 3.36E-01 | 9.40E-01 | 1.47E+00 | 3.47E-01 | 9.55E-01 | 1.2 | 3.42E+00 | 1.69E+01 | 6.03E+00 | 3.87E+00 | 1.64E+01 | 9.93E-10 |
| Promethium (61) | Pm-144 | 8.65E+00 | 1.75E+00 | 4.98E+00 | 7.72E+00 | 1.74E+00 | 6.97E-01 | 1.19 | 5.89E-01 | 2.92E+00 | 1.02E+00 | 6.60E-01 | 2.93E+00 | 2.36E-10 |
| Promethium (61) | Pm-145 | 2.31E-02 | 1.58E-02 | 2.26E-02 | 2.31E-02 | 3.05E-02 | 3.92E-02 | 1.28 | 1.51E+02 | 2.21E+02 | 1.55E+02 | 1.51E+02 | 1.15E+02 | 1.08E-06 |
| Promethium (61) | Pm-146 | 4.12E+00 | 8.37E-01 | 2.39E+00 | 3.69E+00 | 8.39E-01 | 1.25E-01 | 1.2 | 9.45E-01 | 4.65E+00 | 1.63E+00 | 1.06E+00 | 4.64E+00 | 2.14E-09 |
| Promethium (61) | Pm-147 | 4.29E-05 | 1.88E-05 | 3.66E-05 | 4.27E-05 | 3.27E-05 | 2.64E-01 | 1.26 | 9.24E+04 | 2.10E+05 | 1.08E+05 | 9.28E+04 | 1.21E+05 | 9.98E-05 |
| Promethium (61) | Pm-148 | 3.49E+00 | 6.49E-01 | 1.85E+00 | 2.97E+00 | 7.13E-01 | 4.71E+01 | 1.16 | 5.09E+01 | 2.73E+02 | 9.57E+01 | 5.98E+01 | 2.49E+02 | 3.10E-10 |
| Promethium (61) | Pm-148m | 1.12E+01 | 2.26E+00 | 6.43E+00 | 1.00E+01 | 2.23E+00 | 6.12E+00 | 1.19 | 2.01E+00 | 1.00E+01 | 3.51E+00 | 2.25E+00 | 1.01E+01 | 9.42E-11 |

| | | Toxicity and Isotope-specific Information | | | | | | | Dose Compliance Concentrations for Radionuclides in Outdoor Surfaces (SDCCs) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Element (Atomic No.)** | **Radionuclide** | **Soil Volume External Exposure DCF (Infinite Volume) (mrem/yr per pCi/g)** | **Soil Volume External Exposure DCF (1 cm) (mrem/yr per pCi/g)** | **Soil Volume External Exposure DCF (5 cm) (mrem/yr per pCi/g)** | **External Exposure DCF (15 cm) (mrem/yr per pCi/g)** | **External Exposure DCF (Ground Plane) (mrem/yr per pCi/cm$^2$)** | **Lambda** | **$F_{surf}$** | **Soil Volume Soil Volume SDCC (pCi/g)** | **Soil Volume 1cm SDCC (pCi/g)** | **Soil Volume 5cm SDCC (pCi/g)** | **Soil Volume 15cm SDCC (pCi/g)** | **Ground Plane SDCC (pCi/cm$^2$)** | **Soil Volume SDCC (mg/kg)** |
| Actinium (89) | Ac-223 | 1.98E-02 | 4.81E-03 | 1.31E-02 | 1.87E-02 | 5.16E-03 | 1.66E+05 | 1.46 | 2.51E+07 | 1.03E+08 | 3.79E+07 | 2.66E+07 | 9.61E+07 | 6.55E-08 |
| Promethium (61) | Pm-149 | 5.95E-02 | 1.45E-02 | 3.77E-02 | 5.56E-02 | 4.71E-02 | 1.14E+02 | 1.21 | 6.94E+03 | 2.86E+04 | 1.10E+04 | 7.43E+03 | 8.76E+03 | 1.75E-08 |
| Promethium (61) | Pm-150 | 8.56E+00 | 1.59E+00 | 4.57E+00 | 7.29E+00 | 1.65E+00 | 2.27E+03 | 1.17 | 9.94E+02 | 5.35E+03 | 1.86E+03 | 1.17E+03 | 5.17E+03 | 1.28E-10 |
| Promethium (61) | Pm-151 | 1.61E+00 | 3.52E-01 | 9.88E-01 | 1.48E+00 | 3.71E-01 | 2.14E+02 | 1.22 | 4.76E+02 | 2.18E+03 | 7.76E+02 | 5.17E+02 | 2.07E+03 | 6.53E-10 |
| Polonium (84) | Po-203 | 9.53E+00 | 1.80E+00 | 5.17E+00 | 8.17E+00 | 1.79E+00 | 9.92E+03 | 1.19 | 3.85E+03 | 2.03E+04 | 7.10E+03 | 4.49E+03 | 2.05E+04 | 1.53E-10 |
| Polonium (84) | Po-205 | 9.16E+00 | 1.74E+00 | 4.96E+00 | 7.87E+00 | 1.72E+00 | 3.37E+03 | 1.19 | 1.36E+03 | 7.17E+03 | 2.51E+03 | 1.58E+03 | 7.26E+03 | 1.60E-10 |
| Polonium (84) | Po-207 | 7.59E+00 | 1.47E+00 | 4.20E+00 | 6.58E+00 | 1.45E+00 | 1.04E+03 | 1.19 | 5.04E+02 | 2.60E+03 | 9.11E+02 | 5.81E+02 | 2.64E+03 | 1.94E-10 |
| Polonium (84) | Po-210 | 4.92E-05 | 9.55E-06 | 2.74E-05 | 4.31E-05 | 9.44E-06 | 1.83E+00 | 1.18 | 1.64E+05 | 8.47E+05 | 2.95E+05 | 1.88E+05 | 8.57E+05 | 3.66E-05 |
| Polonium (84) | Po-211 | 4.48E-02 | 8.77E-03 | 2.52E-02 | 3.94E-02 | 8.66E-03 | 4.24E+07 | 1.18 | 3.50E+09 | 1.79E+10 | 6.23E+09 | 3.98E+09 | 1.81E+10 | 3.39E-08 |
| Polonium (84) | Po-212 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.17E+13 | 0 | | | | | | |
| Polonium (84) | Po-213 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.20E+12 | 0 | | | | | | |
| Polonium (84) | Po-214 | 4.83E-04 | 9.36E-05 | 2.69E-04 | 4.23E-04 | 9.25E-05 | 1.33E+11 | 1.18 | 1.02E+15 | 5.28E+15 | 1.84E+15 | 1.17E+15 | 5.34E+15 | 3.19E-06 |
| Polonium (84) | Po-215 | 9.44E-04 | 2.00E-04 | 5.69E-04 | 8.67E-04 | 1.96E-04 | 1.23E+10 | 1.21 | 4.72E+13 | 2.23E+14 | 7.83E+13 | 5.13E+13 | 2.27E+14 | 1.60E-06 |
| Polonium (84) | Po-216 | 9.81E-05 | 1.90E-05 | 5.45E-05 | 8.60E-05 | 1.88E-05 | 1.46E+08 | 1.18 | 5.52E+12 | 2.85E+13 | 9.94E+12 | 6.30E+12 | 2.88E+13 | 1.59E-05 |
| Polonium (84) | Po-218 | 5.32E-05 | 1.02E-05 | 2.93E-05 | 4.64E-05 | 1.01E-05 | 1.19E+05 | 1.18 | 8.36E+09 | 4.34E+10 | 1.52E+10 | 9.57E+09 | 4.40E+10 | 2.96E-05 |
| Praseodymium (59) | Pr-136 | 1.22E+01 | 2.35E+00 | 6.71E+00 | 1.06E+01 | 2.38E+00 | 2.78E+04 | 1.18 | 8.47E+03 | 4.40E+04 | 1.54E+04 | 9.75E+03 | 4.34E+04 | 8.04E-11 |
| Praseodymium (59) | Pr-137 | 2.69E+00 | 5.54E-01 | 1.56E+00 | 2.41E+00 | 5.80E-01 | 4.76E+03 | 1.2 | 6.45E+03 | 3.13E+04 | 1.11E+04 | 7.20E+03 | 2.99E+04 | 3.61E-10 |
| Praseodymium (59) | Pr-138 | 4.53E+00 | 9.57E-01 | 2.67E+00 | 4.08E+00 | 1.05E+00 | 2.51E+05 | 1.2 | 2.02E+05 | 9.58E+05 | 3.44E+05 | 2.24E+05 | 8.75E+05 | 2.16E-10 |
| Praseodymium (59) | Pr-138m | 1.42E+01 | 2.76E+00 | 7.89E+00 | 1.24E+01 | 2.74E+00 | 2.89E+03 | 1.18 | 7.56E+02 | 3.88E+03 | 1.36E+03 | 8.64E+02 | 3.91E+03 | 7.01E-11 |
| Praseodymium (59) | Pr-139 | 5.56E-01 | 1.20E-01 | 3.25E-01 | 4.98E-01 | 1.37E-01 | 1.35E+03 | 1.23 | 8.64E+03 | 4.00E+04 | 1.48E+04 | 9.64E+03 | 3.52E+04 | 1.73E-09 |
| Praseodymium (59) | Pr-142 | 4.03E-01 | 8.17E-02 | 2.09E-01 | 3.32E-01 | 1.72E-01 | 3.17E+02 | 1.14 | 3.02E+03 | 1.49E+04 | 5.83E+03 | 3.67E+03 | 7.10E+03 | 2.63E-09 |
| Praseodymium (59) | Pr-142m | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.49E+04 | 0 | | | | | | |
| Praseodymium (59) | Pr-143 | 2.91E-03 | 1.52E-03 | 2.39E-03 | 2.85E-03 | 2.40E-02 | 1.87E+01 | 1.18 | 2.37E+04 | 4.54E+04 | 2.89E+04 | 2.42E+04 | 2.87E+03 | 3.53E-07 |
| Praseodymium (59) | Pr-144 | 2.67E-01 | 7.14E-02 | 1.52E-01 | 2.28E-01 | 1.90E-01 | 2.11E+04 | 1.15 | 3.02E+05 | 1.13E+06 | 5.28E+05 | 3.54E+05 | 4.23E+05 | 4.00E-09 |
| Praseodymium (59) | Pr-144m | 1.20E-02 | 6.23E-03 | 9.66E-03 | 1.14E-02 | 1.23E-02 | 5.06E+04 | 1.28 | 1.44E+07 | 2.78E+07 | 1.79E+07 | 1.52E+07 | 1.41E+07 | 7.97E-08 |
| Praseodymium (59) | Pr-145 | 9.51E-02 | 2.69E-02 | 5.82E-02 | 8.49E-02 | 1.09E-01 | 1.02E+03 | 1.18 | 3.96E+04 | 1.40E+05 | 6.48E+04 | 4.44E+04 | 3.44E+04 | 1.10E-08 |
| Praseodymium (59) | Pr-147 | 4.74E+00 | 9.57E-01 | 2.69E+00 | 4.18E+00 | 1.04E+00 | 2.68E+04 | 1.19 | 2.08E+04 | 1.03E+05 | 3.67E+04 | 2.36E+04 | 9.44E+04 | 2.22E-10 |
| Platinum (78) | Pt-186 | 4.01E+00 | 8.21E-01 | 2.31E+00 | 3.58E+00 | 8.17E-01 | 3.04E+03 | 1.2 | 2.76E+03 | 1.35E+04 | 4.78E+03 | 3.09E+03 | 1.35E+04 | 3.28E-10 |
| Platinum (78) | Pt-188 | 7.68E-01 | 2.05E-01 | 5.32E-01 | 7.37E-01 | 2.12E-01 | 2.48E+01 | 1.31 | 1.08E+02 | 4.06E+02 | 1.57E+02 | 1.13E+02 | 3.92E+02 | 1.59E-09 |
| Platinum (78) | Pt-189 | 1.47E+00 | 3.39E-01 | 9.08E-01 | 1.33E+00 | 3.49E-01 | 5.58E+02 | 1.25 | 1.33E+03 | 5.75E+03 | 2.15E+03 | 1.46E+03 | 5.59E+03 | 8.72E-10 |
| Platinum (78) | Pt-191 | 1.24E+00 | 3.11E-01 | 8.17E-01 | 1.16E+00 | 3.24E-01 | 9.03E+01 | 1.28 | 2.49E+02 | 9.95E+02 | 3.79E+02 | 2.67E+02 | 9.55E+02 | 1.02E-09 |
| Platinum (78) | Pt-193 | 6.30E-06 | 6.30E-06 | 6.30E-06 | 6.30E-06 | 1.80E-04 | 1.39E-02 | 1.56 | 4.49E+05 | 4.49E+05 | 4.49E+05 | 4.49E+05 | 1.58E+04 | 1.21E-02 |
| Platinum (78) | Pt-193m | 2.22E-02 | 9.34E-03 | 1.98E-02 | 2.22E-02 | 1.09E-02 | 5.84E+01 | 1.46 | 7.89E+03 | 1.87E+04 | 8.85E+03 | 7.89E+03 | 1.61E+04 | 5.06E-08 |
| Platinum (78) | Pt-195m | 1.65E-01 | 6.40E-02 | 1.42E-01 | 1.65E-01 | 7.22E-02 | 6.29E+01 | 1.42 | 1.17E+03 | 3.03E+03 | 1.37E+03 | 1.17E+03 | 2.68E+03 | 7.06E-09 |
| Platinum (78) | Pt-197 | 7.25E-02 | 2.29E-02 | 5.61E-02 | 7.14E-02 | 2.79E-02 | 3.32E+02 | 1.42 | 1.41E+04 | 4.47E+04 | 1.83E+04 | 1.44E+04 | 3.68E+04 | 1.63E-08 |
| Platinum (78) | Pt-197m | 3.04E-01 | 8.08E-02 | 2.07E-01 | 2.89E-01 | 8.50E-02 | 3.86E+03 | 1.37 | 4.06E+04 | 1.53E+05 | 5.97E+04 | 4.27E+04 | 1.45E+05 | 4.03E-09 |
| Platinum (78) | Pt-199 | 1.10E+00 | 2.33E-01 | 6.53E-01 | 9.96E-01 | 2.88E-01 | 1.18E+04 | 1.21 | 3.91E+04 | 1.84E+05 | 6.57E+04 | 4.31E+04 | 1.49E+05 | 1.28E-09 |
| Platinum (78) | Pt-200 | 2.01E-01 | 5.84E-02 | 1.47E-01 | 1.96E-01 | 6.37E-02 | 4.86E+02 | 1.37 | 7.74E+03 | 2.67E+04 | 1.06E+04 | 7.96E+03 | 2.45E+04 | 6.18E-09 |
| Plutonium (94) | Pu-234 | 2.07E-01 | 6.43E-02 | 1.63E-01 | 2.07E-01 | 6.75E-02 | 6.90E+02 | 1.36 | 1.07E+04 | 3.45E+04 | 1.36E+04 | 1.07E+04 | 3.29E+04 | 7.06E-09 |
| Plutonium (94) | Pu-235 | 3.04E-01 | 8.88E-02 | 2.28E-01 | 2.97E-01 | 9.34E-02 | 1.44E+04 | 1.36 | 1.53E+05 | 5.24E+05 | 2.04E+05 | 1.57E+05 | 4.98E+05 | 4.85E-09 |
| Plutonium (94) | Pu-236 | 1.81E-04 | 1.18E-04 | 1.61E-04 | 1.79E-04 | 8.58E-04 | 2.43E-01 | 1.42 | 1.92E+04 | 2.95E+04 | 2.16E+04 | 1.94E+04 | 4.06E+03 | 3.62E-05 |
| Plutonium (94) | Pu-237 | 1.45E-01 | 4.57E-02 | 1.14E-01 | 1.45E-01 | 4.96E-02 | 5.58E+00 | 1.38 | 1.23E+02 | 3.90E+02 | 1.56E+02 | 1.23E+02 | 3.60E+02 | 1.01E-08 |
| Plutonium (94) | Pu-238 | 1.16E-04 | 8.77E-05 | 1.08E-04 | 1.16E-04 | 7.31E-04 | 7.90E-03 | 1.42 | 2.66E+04 | 3.54E+04 | 2.88E+04 | 2.68E+04 | 4.24E+03 | 1.56E-03 |
| Plutonium (94) | Pu-239 | 2.63E-04 | 8.88E-05 | 1.88E-04 | 2.52E-04 | 3.31E-04 | 2.88E-05 | 1.42 | 1.18E+04 | 3.48E+04 | 1.64E+04 | 1.23E+04 | 9.33E+03 | 1.89E-01 |
| Plutonium (94) | Pu-240 | 1.12E-04 | 8.58E-05 | 1.06E-04 | 1.12E-04 | 7.01E-04 | 1.06E-04 | 1.42 | 2.75E+04 | 3.60E+04 | 2.93E+04 | 2.75E+04 | 4.40E+03 | 1.21E-01 |
| Plutonium (94) | Pu-241 | 5.30E-06 | 1.63E-06 | 4.10E-06 | 5.28E-06 | 2.01E-06 | 4.81E-02 | 1.41 | 6.02E+05 | 1.95E+06 | 7.77E+05 | 6.04E+05 | 1.59E+06 | 5.85E-03 |
| Plutonium (94) | Pu-242 | 9.90E-05 | 7.25E-05 | 9.21E-05 | 9.90E-05 | 5.81E-04 | 1.84E-06 | 1.42 | 3.12E+04 | 4.26E+04 | 3.35E+04 | 3.12E+04 | 5.31E+03 | 7.95E+00 |
| Plutonium (94) | Pu-243 | 7.11E-02 | 2.33E-02 | 5.61E-02 | 7.01E-02 | 2.65E-02 | 1.22E+03 | 1.34 | 5.63E+04 | 1.71E+05 | 7.12E+04 | 5.70E+04 | 1.51E+05 | 2.17E-08 |
| Plutonium (94) | Pu-244 | 1.38E-01 | 2.41E-02 | 6.96E-02 | 1.13E-01 | 2.36E-02 | 8.66E-09 | 1.42 | 2.24E+01 | 1.28E+02 | 4.44E+01 | 2.73E+01 | 1.31E+02 | 1.23E+00 |
| Plutonium (94) | Pu-244+D | 2.03E+00 | 4.05E-01 | 1.14E+00 | 1.79E+00 | 4.78E-01 | 8.66E-09 | 1.24 | 1.74E+00 | 8.76E+00 | 3.10E+00 | 1.98E+00 | 7.41E+00 | 9.54E-02 |

| | | Toxicity and Isotope-specific Information | | | | | | | Dose Compliance Concentrations for Radionuclides in Outdoor Surfaces (SDCCs) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Element (Atomic No.)** | **Radionuclide** | **Soil Volume External Exposure DCF (Infinite Volume) (mrem/yr per pCi/g)** | **Soil Volume External Exposure DCF (1 cm) (mrem/yr per pCi/g)** | **Soil Volume External Exposure DCF (5 cm) (mrem/yr per pCi/g)** | **External Exposure DCF (15 cm) (mrem/yr per pCi/g)** | **External Exposure DCF (Ground Plane) (mrem/yr per pCi/cm$^2$)** | **Lambda** | **$F_{surf}$** | **Soil Volume Soil Volume SDCC (pCi/g)** | **Soil Volume 1cm SDCC (pCi/g)** | **Soil Volume 5cm SDCC (pCi/g)** | **Soil Volume 15cm SDCC (pCi/g)** | **Ground Plane SDCC (pCi/cm$^2$)** | **Soil Volume SDCC (mg/kg)** |
| Actinium (89) | Ac-223 | 1.98E-02 | 4.81E-03 | 1.31E-02 | 1.87E-02 | 5.16E-03 | 1.66E+05 | 1.46 | 2.51E+07 | 1.03E+08 | 3.79E+07 | 2.66E+07 | 9.61E+07 | 6.55E-08 |
| Plutonium (94) | Pu-244+E | 2.03E+00 | 4.05E-01 | 1.14E+00 | 1.79E+00 | 4.78E-01 | 8.66E-09 | | | | | | | |
| Plutonium (94) | Pu-245 | 2.22E+00 | 4.61E-01 | 1.31E+00 | 2.00E+00 | 4.74E-01 | 5.78E+02 | 1.22 | 9.32E+02 | 4.49E+03 | 1.58E+03 | 1.04E+03 | 4.37E+03 | 7.67E-10 |
| Plutonium (94) | Pu-246 | 5.17E-01 | 1.38E-01 | 3.66E-01 | 5.04E-01 | 1.44E-01 | 2.33E+01 | 1.32 | 1.50E+02 | 5.64E+02 | 2.12E+02 | 1.54E+02 | 5.41E+02 | 3.08E-09 |
| Radium (88) | Ra-222 | 4.70E-02 | 1.03E-02 | 2.95E-02 | 4.40E-02 | 1.01E-02 | 5.75E+05 | 1.22 | 4.38E+07 | 1.99E+08 | 6.98E+07 | 4.68E+07 | 2.04E+08 | 3.28E-08 |
| Radium (88) | Ra-223 | 5.52E-01 | 1.41E-01 | 3.79E-01 | 5.30E-01 | 1.41E-01 | 2.21E+01 | 1.31 | 1.34E+02 | 5.27E+02 | 1.96E+02 | 1.40E+02 | 5.25E+02 | 2.62E-09 |
| Radium (88) | Ra-223+D | 1.39E+00 | 3.26E-01 | 8.90E-01 | 1.30E+00 | 4.29E-01 | 2.21E+01 | 1.11 | 6.29E+01 | 2.68E+02 | 9.83E+01 | 6.73E+01 | 2.04E+02 | 1.23E-09 |
| Radium (88) | Ra-223+E | 1.39E+00 | 3.26E-01 | 8.90E-01 | 1.30E+00 | 4.29E-01 | 2.21E+01 | | | | | | | |
| Radium (88) | Ra-224 | 4.72E-02 | 1.09E-02 | 3.10E-02 | 4.51E-02 | 1.07E-02 | 6.91E+01 | 1.25 | 5.14E+03 | 2.22E+04 | 7.83E+03 | 5.37E+03 | 2.27E+04 | 3.23E-08 |
| Radium (88) | Ra-224+D | 9.66E+00 | 1.67E+00 | 4.81E+00 | 7.83E+00 | 1.68E+00 | 6.91E+01 | 1.15 | 2.72E+01 | 1.58E+02 | 5.46E+01 | 3.35E+01 | 1.56E+02 | 1.71E-10 |
| Radium (88) | Ra-224+E | 9.66E+00 | 1.67E+00 | 4.81E+00 | 7.83E+00 | 1.68E+00 | 6.91E+01 | | | | | | | |
| Radium (88) | Ra-225 | 8.60E-03 | 6.21E-03 | 8.54E-03 | 8.58E-03 | 1.25E-02 | 1.71E+01 | 1.38 | 6.31E+03 | 8.74E+03 | 6.36E+03 | 6.33E+03 | 4.35E+03 | 1.61E-07 |
| Radium (88) | Ra-225+D | 1.19E+00 | 2.59E-01 | 7.18E-01 | 1.08E+00 | 3.12E-01 | 1.71E+01 | 1.21 | 5.19E+01 | 2.38E+02 | 8.60E+01 | 5.72E+01 | 1.98E+02 | 1.33E-09 |
| Radium (88) | Ra-225+E | 1.19E+00 | 2.59E-01 | 7.18E-01 | 1.08E+00 | 3.12E-01 | 1.71E+01 | | | | | | | |
| Radium (88) | Ra-226 | 2.91E-02 | 7.24E-03 | 2.00E-02 | 2.82E-02 | 7.13E-03 | 4.33E-04 | 1.29 | 1.17E+02 | 4.69E+02 | 1.70E+02 | 1.20E+02 | 4.76E+02 | 1.18E-04 |
| Radium (88) | Ra-226+D | 1.06E+01 | | | | | 4.33E-04 | 1.17 | 3.54E-01 | | | | | 3.58E-07 |
| Radium (88) | Ra-226+E | 1.06E+01 | 1.94E+00 | 5.60E+00 | 8.95E+00 | 1.97E+00 | 4.33E-04 | | | | | | | |
| Radium (88) | Ra-227 | 7.87E-01 | 1.76E-01 | 4.89E-01 | 7.31E-01 | 2.12E-01 | 8.63E+03 | 1.32 | 3.64E+04 | 1.63E+05 | 5.86E+04 | 3.92E+04 | 1.35E+05 | 1.86E-09 |
| Radium (88) | Ra-227+D | | | | | | 8.63E+03 | 1.18 | | | | | | |
| Radium (88) | Ra-228 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.21E-01 | 0 | | | | | | |
| Radium (88) | Ra-228+D | 5.65E+00 | 1.07E+00 | 3.08E+00 | 4.89E+00 | 1.10E+00 | 1.21E-01 | 1.17 | 7.03E-01 | 3.70E+00 | 1.29E+00 | 8.13E-01 | 3.62E+00 | 2.58E-09 |
| Radium (88) | Ra-228+E | 1.53E+01 | 2.74E+00 | 7.89E+00 | 1.27E+01 | 2.78E+00 | 1.21E-01 | | | | | | | |
| Rubidium (37) | Rb-79 | 7.39E+00 | 1.54E+00 | 4.38E+00 | 6.70E+00 | 1.61E+00 | 1.59E+04 | 1.22 | 7.76E+03 | 3.71E+04 | 1.31E+04 | 8.56E+03 | 3.56E+04 | 7.48E-11 |
| Rubidium (37) | Rb-80 | 7.03E+00 | 1.49E+00 | 4.16E+00 | 6.38E+00 | 1.61E+00 | 6.43E+05 | 1.2 | 3.34E+05 | 1.57E+06 | 5.65E+05 | 3.68E+05 | 1.46E+06 | 8.07E-11 |
| Rubidium (37) | Rb-81 | 3.26E+00 | 6.94E-01 | 1.98E+00 | 3.00E+00 | 6.98E-01 | 1.33E+03 | 1.25 | 1.42E+03 | 6.67E+03 | 2.34E+03 | 1.54E+03 | 6.63E+03 | 1.68E-10 |
| Rubidium (37) | Rb-81m | 1.18E-02 | 4.21E-03 | 9.85E-03 | 1.18E-02 | 5.73E-03 | 1.14E+04 | 1.46 | 2.88E+06 | 8.09E+06 | 3.46E+06 | 2.88E+06 | 5.95E+06 | 3.98E-08 |
| Rubidium (37) | Rb-82 | 6.12E+00 | 1.28E+00 | 3.60E+00 | 5.54E+00 | 1.40E+00 | 2.80E+05 | 1.2 | 1.67E+05 | 7.97E+05 | 2.84E+05 | 1.85E+05 | 7.31E+05 | 9.50E-11 |
| Rubidium (37) | Rb-82m | 1.69E+01 | 3.25E+00 | 9.33E+00 | 1.47E+01 | 3.20E+00 | 9.79E+02 | 1.19 | 2.14E+02 | 1.11E+03 | 3.88E+02 | 2.45E+02 | 1.13E+03 | 3.47E-11 |
| Rubidium (37) | Rb-83 | 2.74E+00 | 5.63E-01 | 1.61E+00 | 2.48E+00 | 5.55E-01 | 2.93E+00 | 1.26 | 3.94E+00 | 1.92E+01 | 6.73E+00 | 4.36E+00 | 1.95E+01 | 2.16E-10 |
| Rubidium (37) | Rb-84 | 5.26E+00 | 1.03E+00 | 2.95E+00 | 4.63E+00 | 1.02E+00 | 7.72E+00 | 1.21 | 5.33E+00 | 2.73E+01 | 9.51E+00 | 6.06E+00 | 2.75E+01 | 1.13E-10 |
| Rubidium (37) | Rb-86 | 5.87E-01 | 1.17E-01 | 3.19E-01 | 5.04E-01 | 1.95E-01 | 1.36E+01 | 1.16 | 8.69E+01 | 4.35E+02 | 1.60E+02 | 1.01E+02 | 2.62E+02 | 1.07E-09 |
| Rubidium (37) | Rb-87 | 1.21E-04 | 5.24E-05 | 1.04E-04 | 1.21E-04 | 8.52E-05 | 1.47E-11 | 1.25 | 2.88E+04 | 6.66E+04 | 3.37E+04 | 2.89E+04 | 4.10E+04 | 3.30E+05 |
| Rubidium (37) | Rb-88 | 4.21E+00 | 7.61E-01 | 2.11E+00 | 3.43E+00 | 8.65E-01 | 2.05E+04 | 1.14 | 1.87E+04 | 1.04E+05 | 3.74E+04 | 2.30E+04 | 9.12E+04 | 1.56E-10 |
| Rubidium (37) | Rb-89 | 1.30E+01 | 2.28E+00 | 6.56E+00 | 1.07E+01 | 2.30E+00 | 2.40E+04 | 1.15 | 7.03E+03 | 4.02E+04 | 1.39E+04 | 8.56E+03 | 3.98E+04 | 5.07E-11 |
| Rhenium (75) | Re-177 | 3.28E+00 | 6.66E-01 | 1.85E+00 | 2.85E+00 | 6.94E-01 | 2.60E+04 | 1.19 | 2.91E+04 | 1.44E+05 | 5.18E+04 | 3.35E+04 | 1.38E+05 | 3.85E-10 |
| Rhenium (75) | Re-178 | 7.05E+00 | 1.32E+00 | 3.75E+00 | 5.95E+00 | 1.34E+00 | 2.76E+04 | 1.17 | 1.47E+04 | 7.83E+04 | 2.76E+04 | 1.74E+04 | 7.70E+04 | 1.84E-10 |
| Rhenium (75) | Re-180 | 6.60E+00 | 1.31E+00 | 3.69E+00 | 5.76E+00 | 1.31E+00 | 1.50E+05 | 1.18 | 8.41E+04 | 4.25E+05 | 1.50E+05 | 9.64E+04 | 4.25E+05 | 1.96E-10 |
| Rhenium (75) | Re-181 | 3.99E+00 | 8.39E-01 | 2.35E+00 | 3.58E+00 | 8.40E-01 | 3.04E+02 | 1.2 | 2.78E+02 | 1.32E+03 | 4.71E+02 | 3.09E+02 | 1.32E+03 | 3.21E-10 |
| Rhenium (75) | Re-182 | 1.03E+01 | 2.03E+00 | 5.76E+00 | 8.93E+00 | 2.02E+00 | 9.49E+01 | | | | | | | |
| Rhenium (75) | Re-182m | 6.70E+00 | 1.27E+00 | 3.60E+00 | 5.69E+00 | 1.26E+00 | 4.78E+02 | | | | | | | |
| Rhenium (75) | Re-184 | 4.92E+00 | 9.79E-01 | 2.76E+00 | 4.31E+00 | 9.77E-01 | 6.66E+00 | 1.18 | 5.01E+00 | 2.52E+01 | 8.94E+00 | 5.73E+00 | 2.53E+01 | 2.69E-10 |
| Rhenium (75) | Re-184m | 1.90E+00 | 4.16E-01 | 1.14E+00 | 1.72E+00 | 4.19E-01 | 1.53E+00 | 1.22 | 3.68E+00 | 1.68E+01 | 6.12E+00 | 4.08E+00 | 1.67E+01 | 8.57E-10 |
| Rhenium (75) | Re-186 | 7.18E-02 | 2.24E-02 | 5.45E-02 | 7.07E-02 | 5.16E-02 | 6.70E+01 | 1.3 | 3.13E+03 | 1.01E+04 | 4.13E+03 | 3.18E+03 | 4.36E+03 | 1.69E-08 |
| Rhenium (75) | Re-186m | 2.35E-02 | 1.13E-02 | 2.14E-02 | 2.35E-02 | 1.49E-02 | 3.47E-06 | 1.52 | 1.22E+02 | 2.55E+02 | 1.34E+02 | 1.22E+02 | 1.92E+02 | 1.27E-02 |
| Rhenium (75) | Re-186m+D | 9.55E-02 | | | | | 3.47E-06 | 1.17 | 3.94E+01 | | | | | 4.10E-03 |
| Rhenium (75) | Re-186m+E | 9.53E-02 | 3.36E-02 | 7.59E-02 | 9.42E-02 | 6.65E-02 | 3.47E-06 | | | | | | | |
| Rhenium (75) | Re-187 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.39E-11 | 0 | | | | | | |
| Rhenium (75) | Re-188 | 3.11E-01 | 7.87E-02 | 1.96E-01 | 2.85E-01 | 1.69E-01 | 3.58E+02 | 1.23 | 4.10E+03 | 1.62E+04 | 6.53E+03 | 4.48E+03 | 7.55E+03 | 4.19E-09 |
| Rhenium (75) | Re-188m | 1.69E-01 | 6.83E-02 | 1.46E-01 | 1.68E-01 | 7.90E-02 | 1.96E+04 | 1.39 | 3.65E+05 | 9.03E+05 | 4.22E+05 | 3.67E+05 | 7.80E+05 | 6.81E-09 |
| Rhenium (75) | Re-189 | 3.08E-01 | 7.57E-02 | 2.05E-01 | 2.95E-01 | 9.81E-02 | 2.50E+02 | 1.28 | 2.78E+03 | 1.13E+04 | 4.17E+03 | 2.90E+03 | 8.71E+03 | 4.08E-09 |

| | | Toxicity and Isotope-specific Information | | | | | | | Dose Compliance Concentrations for Radionuclides in Outdoor Surfaces (SDCCs) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Element (Atomic No.) | Radionuclide | Soil Volume External Exposure DCF (Infinite Volume) (mrem/yr per pCi/g) | Soil Volume External Exposure DCF (1 cm) (mrem/yr per pCi/g) | Soil Volume External Exposure DCF (5 cm) (mrem/yr per pCi/g) | External Exposure DCF (15 cm) (mrem/yr per pCi/g) | External Exposure DCF (Ground Plane) (mrem/yr per pCi/cm$^2$) | Lambda | $F_{surf}$ | Soil Volume Soil Volume SDCC (pCi/g) | Soil Volume 1cm SDCC (pCi/g) | Soil Volume 5cm SDCC (pCi/g) | Soil Volume 15cm SDCC (pCi/g) | Ground Plane SDCC (pCi/cm$^2$) | Soil Volume SDCC (mg/kg) |
| Actinium (89) | Ac-223 | 1.98E-02 | 4.81E-03 | 1.31E-02 | 1.87E-02 | 5.16E-03 | 1.66E+05 | 1.46 | 2.51E+07 | 1.03E+08 | 3.79E+07 | 2.66E+07 | 9.61E+07 | 6.55E-08 |
| Rhodium (45) | Rh-100 | 1.72E+01 | 2.98E+00 | 8.65E+00 | 1.41E+01 | 2.91E+00 | 2.92E+02 | 1.16 | 6.43E+01 | 3.70E+02 | 1.28E+02 | 7.82E+01 | 3.80E+02 | 4.28E-11 |
| Rhodium (45) | Rh-101 | 1.12E+00 | 2.78E-01 | 7.68E-01 | 1.09E+00 | 2.80E-01 | 2.17E-01 | 1.29 | 3.37E+00 | 1.36E+01 | 4.93E+00 | 3.48E+00 | 1.35E+01 | 3.05E-09 |
| Rhodium (45) | Rh-101m | 1.51E+00 | 3.30E-01 | 9.42E-01 | 1.41E+00 | 3.30E-01 | 5.83E+01 | 1.26 | 1.35E+02 | 6.13E+02 | 2.15E+02 | 1.44E+02 | 6.13E+02 | 4.52E-10 |
| Rhodium (45) | Rh-102 | 1.22E+01 | 2.39E+00 | 6.84E+00 | 1.07E+01 | 2.36E+00 | 2.39E-01 | 1.19 | 3.39E-01 | 1.73E+00 | 6.03E-01 | 3.85E-01 | 1.75E+00 | 2.81E-10 |
| Rhodium (45) | Rh-102m | 2.65E+00 | 5.43E-01 | 1.54E+00 | 2.39E+00 | 5.57E-01 | 1.22E+00 | 1.22 | 2.35E+00 | 1.15E+01 | 4.03E+00 | 2.61E+00 | 1.12E+01 | 3.81E-10 |
| Rhodium (45) | Rh-103m | 1.70E-04 | 1.63E-04 | 1.70E-04 | 1.70E-04 | 1.03E-03 | 6.49E+03 | 1.35 | 1.24E+08 | 1.29E+08 | 1.24E+08 | 1.24E+08 | 2.04E+07 | 3.83E-06 |
| Rhodium (45) | Rh-105 | 3.97E-01 | 8.75E-02 | 2.50E-01 | 3.73E-01 | 8.66E-02 | 1.72E+02 | 1.22 | 1.55E+03 | 7.05E+03 | 2.47E+03 | 1.65E+03 | 7.12E+03 | 1.84E-09 |
| Rhodium (45) | Rh-106 | 1.24E+00 | 2.78E-01 | 7.29E-01 | 1.11E+00 | 4.03E-01 | 7.31E+05 | 1.19 | 2.16E+06 | 9.67E+06 | 3.69E+06 | 2.41E+06 | 6.68E+06 | 6.08E-10 |
| Rhodium (45) | Rh-106m | 1.71E+01 | 3.25E+00 | 9.34E+00 | 1.48E+01 | 3.21E+00 | 2.76E+03 | 1.18 | 6.03E+02 | 3.17E+03 | 1.10E+03 | 6.96E+02 | 3.21E+03 | 4.49E-11 |
| Rhodium (45) | Rh-107 | 1.62E+00 | 3.56E-01 | 1.01E+00 | 1.51E+00 | 3.94E-01 | 1.68E+04 | 1.22 | 3.73E+04 | 1.70E+05 | 6.00E+04 | 3.99E+04 | 1.53E+05 | 4.62E-10 |
| Rhodium (45) | Rh-99 | 3.15E+00 | 6.60E-01 | 1.86E+00 | 2.83E+00 | 6.61E-01 | 1.58E+01 | 1.23 | 1.78E+01 | 8.51E+01 | 3.02E+01 | 1.98E+01 | 8.51E+01 | 2.17E-10 |
| Rhodium (45) | Rh-99m | 3.79E+00 | 7.53E-01 | 2.16E+00 | 3.36E+00 | 7.46E-01 | 1.29E+03 | 1.21 | 1.23E+03 | 6.18E+03 | 2.15E+03 | 1.39E+03 | 6.25E+03 | 1.83E-10 |
| Radon (86) | Rn-218 | 4.25E-03 | 8.56E-04 | 2.44E-03 | 3.80E-03 | 8.46E-04 | 6.24E+08 | 1.19 | 5.39E+11 | 2.68E+12 | 9.38E+11 | 6.03E+11 | 2.71E+12 | 3.65E-07 |
| Radon (86) | Rn-219 | 2.85E-01 | 6.29E-02 | 1.78E-01 | 2.67E-01 | 6.16E-02 | 5.52E+06 | 1.23 | 6.90E+07 | 3.13E+08 | 1.10E+08 | 7.38E+07 | 3.19E+08 | 5.31E-09 |
| Radon (86) | Rn-219+D | 8.37E-01 | 1.85E-01 | 5.13E-01 | 7.70E-01 | 2.89E-01 | 5.52E+06 | 1.13 | 2.56E+07 | 1.15E+08 | 4.17E+07 | 2.78E+07 | 7.40E+07 | 1.97E-09 |
| Radon (86) | Rn-219+E | 8.37E-01 | 1.85E-01 | 5.13E-01 | 7.70E-01 | 2.89E-01 | 5.52E+06 | | | | | | | |
| Radon (86) | Rn-220 | 2.14E-03 | 4.36E-04 | 1.25E-03 | 1.92E-03 | 4.31E-04 | 3.93E+05 | 1.2 | 6.70E+08 | 3.29E+09 | 1.15E+09 | 7.48E+08 | 3.34E+09 | 7.28E-07 |
| Radon (86) | Rn-222 | 2.18E-03 | 4.51E-04 | 1.29E-03 | 1.98E-03 | 4.46E-04 | 6.62E+01 | 1.2 | 1.11E+05 | 5.35E+05 | 1.87E+05 | 1.22E+05 | 5.41E+05 | 7.20E-07 |
| Radon (86) | Rn-222+D | 1.06E+01 | 1.94E+00 | 5.58E+00 | 8.91E+00 | 1.96E+00 | 6.62E+01 | 1.17 | 2.34E+01 | 1.28E+02 | 4.45E+01 | 2.78E+01 | 1.26E+02 | 1.53E-10 |
| Radon (86) | Rn-222+E | 1.06E+01 | 1.94E+00 | 5.58E+00 | 8.93E+00 | 2.01E+00 | 6.62E+01 | | | | | | | |
| Ruthenium (44) | Ru-103 | 2.57E+00 | 5.32E-01 | 1.51E+00 | 2.33E+00 | 5.24E-01 | 6.44E+00 | 1.2 | 9.14E+00 | 4.43E+01 | 1.55E+01 | 1.01E+01 | 4.49E+01 | 2.84E-10 |
| Ruthenium (44) | Ru-105 | 4.40E+00 | 8.88E-01 | 2.54E+00 | 3.94E+00 | 9.13E-01 | 1.37E+03 | 1.19 | 1.14E+03 | 5.67E+03 | 1.98E+03 | 1.28E+03 | 5.51E+03 | 1.70E-10 |
| Ruthenium (44) | Ru-105+D | 4.79E+00 | 9.75E-01 | 2.78E+00 | 4.31E+00 | 9.99E-01 | 1.37E+03 | 1.02 | 1.23E+03 | 6.04E+03 | 2.12E+03 | 1.37E+03 | 5.89E+03 | 1.83E-10 |
| Ruthenium (44) | Ru-106 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.87E-01 | 0 | | | | | | |
| Ruthenium (44) | Ru-106+D | 1.24E+00 | 2.78E-01 | 7.29E-01 | 1.11E+00 | 4.03E-01 | 6.87E-01 | 1.19 | 4.09E+00 | 1.83E+01 | 6.97E+00 | 4.57E+00 | 1.26E+01 | 1.22E-09 |
| Ruthenium (44) | Ru-106+E | 1.24E+00 | 2.78E-01 | 7.29E-01 | 1.11E+00 | 4.03E-01 | 6.87E-01 | | | | | | | |
| Ruthenium (44) | Ru-94 | 2.89E+00 | 5.87E-01 | 1.68E+00 | 2.59E+00 | 5.84E-01 | 7.03E+03 | 1.23 | 8.68E+03 | 4.27E+04 | 1.49E+04 | 9.67E+03 | 4.30E+04 | 2.25E-10 |
| Ruthenium (44) | Ru-97 | 1.09E+00 | 2.54E-01 | 7.14E-01 | 1.04E+00 | 2.52E-01 | 8.72E+01 | 1.29 | 2.72E+02 | 1.17E+03 | 4.16E+02 | 2.85E+02 | 1.18E+03 | 5.87E-10 |
| Sulfur (16) | S-35 | 1.22E-05 | 6.96E-06 | 1.13E-05 | 1.22E-05 | 1.55E-05 | 2.89E+00 | 1.25 | 8.76E+05 | 1.54E+06 | 9.43E+05 | 8.76E+05 | 6.89E+05 | 2.06E-05 |
| Antimony (51) | Sb-115 | 4.94E+00 | 1.02E+00 | 2.91E+00 | 4.48E+00 | 1.04E+00 | 1.15E+04 | 1.21 | 8.41E+03 | 4.07E+04 | 1.43E+04 | 9.29E+03 | 3.99E+04 | 1.64E-10 |
| Antimony (51) | Sb-116 | 1.30E+01 | 2.37E+00 | 6.84E+00 | 1.10E+01 | 2.37E+00 | 2.31E+04 | 1.16 | 6.65E+03 | 3.66E+04 | 1.27E+04 | 7.88E+03 | 3.66E+04 | 6.50E-11 |
| Antimony (51) | Sb-116m | 1.83E+01 | 3.47E+00 | 9.94E+00 | 1.58E+01 | 3.42E+00 | 6.04E+03 | 1.18 | 1.23E+03 | 6.49E+03 | 2.26E+03 | 1.43E+03 | 6.58E+03 | 4.57E-11 |
| Antimony (51) | Sb-117 | 7.35E-01 | 1.83E-01 | 4.98E-01 | 7.05E-01 | 1.93E-01 | 2.17E+03 | 1.27 | 1.02E+04 | 4.10E+04 | 1.50E+04 | 1.06E+04 | 3.89E+04 | 1.07E-09 |
| Antimony (51) | Sb-118m | 1.51E+01 | 2.82E+00 | 8.11E+00 | 1.29E+01 | 2.79E+00 | 1.21E+03 | 1.18 | 2.99E+02 | 1.61E+03 | 5.57E+02 | 3.49E+02 | 1.62E+03 | 5.64E-11 |
| Antimony (51) | Sb-119 | 4.48E-03 | 4.35E-03 | 4.49E-03 | 4.48E-03 | 1.82E-02 | 1.59E+02 | 1.32 | 1.18E+05 | 1.22E+05 | 1.18E+05 | 1.18E+05 | 2.91E+04 | 1.71E-07 |
| Antimony (51) | Sb-120 | 2.44E+00 | 5.07E-01 | 1.43E+00 | 2.20E+00 | 5.45E-01 | 2.29E+04 | | | | | | | |
| Antimony (51) | Sb-120m | 1.43E+01 | 2.70E+00 | 7.74E+00 | 1.23E+01 | 2.66E+00 | 4.39E+01 | | | | | | | |
| Antimony (51) | Sb-122 | 2.48E+00 | 5.07E-01 | 1.44E+00 | 2.22E+00 | 5.66E-01 | 9.37E+01 | 1.19 | 1.39E+02 | 6.77E+02 | 2.39E+02 | 1.55E+02 | 6.07E+02 | 3.50E-10 |
| Antimony (51) | Sb-124 | 1.11E+01 | 2.00E+00 | 5.78E+00 | 9.33E+00 | 1.98E+00 | 4.20E+00 | 1.16 | 1.46E+00 | 8.07E+00 | 2.79E+00 | 1.73E+00 | 8.12E+00 | 8.34E-11 |
| Antimony (51) | Sb-124m | 1.98E+00 | 3.99E-01 | 1.14E+00 | 1.77E+00 | 4.01E-01 | 2.35E+05 | 1.19 | 4.36E+05 | 2.16E+06 | 7.58E+05 | 4.88E+05 | 2.15E+06 | 4.46E-10 |
| Antimony (51) | Sb-124n | 1.37E-05 | 1.34E-05 | 1.38E-05 | 1.37E-05 | 5.92E-05 | 1.80E+04 | 1.32 | 4.37E+09 | 4.47E+09 | 4.35E+09 | 4.37E+09 | 1.01E+09 | 5.83E-05 |
| Antimony (51) | Sb-125 | 2.28E+00 | 4.74E-01 | 1.34E+00 | 2.07E+00 | 4.77E-01 | 2.50E-01 | 1.21 | 1.79E+00 | 8.62E+00 | 3.04E+00 | 1.97E+00 | 8.55E+00 | 1.74E-09 |
| Antimony (51) | Sb-126 | 1.60E+01 | 3.21E+00 | 9.14E+00 | 1.43E+01 | 3.17E+00 | 2.04E+01 | 1.19 | 4.69E+00 | 2.34E+01 | 8.23E+00 | 5.27E+00 | 2.37E+01 | 5.62E-11 |
| Antimony (51) | Sb-126m | 8.71E+00 | 1.76E+00 | 5.02E+00 | 7.80E+00 | 1.81E+00 | 1.92E+04 | 1.19 | 8.09E+03 | 4.01E+04 | 1.41E+04 | 9.04E+03 | 3.90E+04 | 1.03E-10 |
| Antimony (51) | Sb-127 | 3.86E+00 | 7.76E-01 | 2.22E+00 | 3.45E+00 | 7.89E-01 | 6.57E+01 | 1.19 | 6.25E+01 | 3.11E+02 | 1.09E+02 | 7.00E+01 | 3.06E+02 | 2.35E-10 |
| Antimony (51) | Sb-128 | 1.76E+01 | 3.49E+00 | 9.98E+00 | 1.56E+01 | 3.48E+00 | 6.74E+02 | | | | | | | |
| Antimony (51) | Sb-128m | 1.13E+01 | 2.26E+00 | 6.43E+00 | 1.00E+01 | 2.32E+00 | 3.50E+04 | | | | | | | |
| Antimony (51) | Sb-129 | 8.54E+00 | 1.60E+00 | 4.61E+00 | 7.33E+00 | 1.60E+00 | 1.41E+03 | 1.17 | 6.16E+02 | 3.29E+03 | 1.14E+03 | 7.18E+02 | 3.29E+03 | 1.10E-10 |
| Antimony (51) | Sb-130 | 1.88E+01 | 3.66E+00 | 1.05E+01 | 1.64E+01 | 3.66E+00 | 9.11E+03 | 1.18 | 1.79E+03 | 9.25E+03 | 3.23E+03 | 2.05E+03 | 9.22E+03 | 4.97E-11 |

| | | Toxicity and Isotope-specific Information | | | | | | | Dose Compliance Concentrations for Radionuclides in Outdoor Surfaces (SDCCs) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Element (Atomic No.)** | **Radionuclide** | **Soil Volume External Exposure DCF (Infinite Volume) (mrem/yr per pCi/g)** | **Soil Volume External Exposure DCF (1 cm) (mrem/yr per pCi/g)** | **Soil Volume External Exposure DCF (5 cm) (mrem/yr per pCi/g)** | **External Exposure DCF (15 cm) (mrem/yr per pCi/g)** | **External Exposure DCF (Ground Plane) (mrem/yr per pCi/cm$^2$)** | **Lambda** | **$F_{surf}$** | **Soil Volume Soil Volume SDCC (pCi/g)** | **Soil Volume 1cm SDCC (pCi/g)** | **Soil Volume 5cm SDCC (pCi/g)** | **Soil Volume 15cm SDCC (pCi/g)** | **Ground Plane SDCC (pCi/cm$^2$)** | **Soil Volume SDCC (mg/kg)** |
| Actinium (89) | Ac-223 | 1.98E-02 | 4.81E-03 | 1.31E-02 | 1.87E-02 | 5.16E-03 | 1.66E+05 | 1.46 | 2.51E+07 | 1.03E+08 | 3.79E+07 | 2.66E+07 | 9.61E+07 | 6.55E-08 |
| Antimony (51) | Sb-131 | 1.13E+01 | 2.05E+00 | 5.93E+00 | 9.55E+00 | 2.07E+00 | 1.58E+04 | 1.16 | 5.29E+03 | 2.91E+04 | 1.01E+04 | 6.26E+03 | 2.89E+04 | 8.49E-11 |
| Scandium (21) | Sc-43 | 5.95E+00 | 1.24E+00 | 3.54E+00 | 5.43E+00 | 1.25E+00 | 1.56E+03 | 1.2 | 9.55E+02 | 4.57E+03 | 1.60E+03 | 1.05E+03 | 4.55E+03 | 5.11E-11 |
| Scandium (21) | Sc-44 | 1.24E+01 | 2.39E+00 | 6.86E+00 | 1.08E+01 | 2.43E+00 | 1.55E+03 | 1.18 | 4.63E+02 | 2.41E+03 | 8.37E+02 | 5.30E+02 | 2.37E+03 | 2.56E-11 |
| Scandium (21) | Sc-44m | 1.44E+00 | 3.13E-01 | 8.93E-01 | 1.34E+00 | 3.06E-01 | 1.04E+02 | 1.21 | 2.59E+02 | 1.19E+03 | 4.19E+02 | 2.79E+02 | 1.22E+03 | 2.14E-10 |
| Scandium (21) | Sc-46 | 1.20E+01 | 2.24E+00 | 6.43E+00 | 1.03E+01 | 2.19E+00 | 3.02E+00 | 1.17 | 9.94E-01 | 5.32E+00 | 1.85E+00 | 1.16E+00 | 5.43E+00 | 2.94E-11 |
| Scandium (21) | Sc-47 | 4.61E-01 | 1.18E-01 | 3.25E-01 | 4.51E-01 | 1.16E-01 | 7.55E+01 | 1.24 | 5.79E+02 | 2.26E+03 | 8.22E+02 | 5.91E+02 | 2.29E+03 | 7.00E-10 |
| Scandium (21) | Sc-48 | 2.03E+01 | 3.69E+00 | 1.07E+01 | 1.72E+01 | 3.63E+00 | 1.39E+02 | 1.16 | 2.58E+01 | 1.42E+02 | 4.90E+01 | 3.05E+01 | 1.44E+02 | 1.73E-11 |
| Scandium (21) | Sc-49 | 3.60E-02 | 1.88E-02 | 2.74E-02 | 3.39E-02 | 1.19E-01 | 6.35E+03 | 1.14 | 6.80E+05 | 1.30E+06 | 8.93E+05 | 7.21E+05 | 2.06E+05 | 1.02E-08 |
| Selenium (34) | Se-70 | 5.32E+00 | 1.12E+00 | 3.17E+00 | 4.83E+00 | 1.16E+00 | 8.88E+03 | 1.25 | 5.87E+03 | 2.79E+04 | 9.84E+03 | 6.46E+03 | 2.68E+04 | 8.98E-11 |
| Selenium (34) | Se-73 | 5.69E+00 | 1.22E+00 | 3.43E+00 | 5.22E+00 | 1.25E+00 | 8.49E+02 | 1.23 | 5.34E+02 | 2.49E+03 | 8.85E+02 | 5.81E+02 | 2.43E+03 | 8.90E-11 |
| Selenium (34) | Se-73m | 1.33E+00 | 2.78E-01 | 7.87E-01 | 1.21E+00 | 2.94E-01 | 9.34E+03 | 1.23 | 2.49E+04 | 1.20E+05 | 4.22E+04 | 2.75E+04 | 1.13E+05 | 3.78E-10 |
| Selenium (34) | Se-75 | 1.83E+00 | 4.29E-01 | 1.20E+00 | 1.75E+00 | 4.21E-01 | 2.11E+00 | 1.31 | 4.39E+00 | 1.87E+01 | 6.66E+00 | 4.59E+00 | 1.90E+01 | 3.02E-10 |
| Selenium (34) | Se-77m | 3.64E-01 | 9.23E-02 | 2.54E-01 | 3.54E-01 | 9.07E-02 | 1.25E+06 | 1.37 | 1.10E+07 | 4.35E+07 | 1.58E+07 | 1.13E+07 | 4.43E+07 | 1.32E-09 |
| Selenium (34) | Se-79 | 1.53E-05 | 8.69E-06 | 1.42E-05 | 1.53E-05 | 1.91E-05 | 1.07E-05 | 1.25 | 2.29E+05 | 4.02E+05 | 2.46E+05 | 2.29E+05 | 1.83E+05 | 3.29E+00 |
| Selenium (34) | Se-81 | 6.53E-02 | 2.00E-02 | 4.27E-02 | 6.06E-02 | 9.50E-02 | 1.97E+04 | 1.2 | 1.10E+06 | 3.60E+06 | 1.68E+06 | 1.18E+06 | 7.55E+05 | 8.77E-09 |
| Selenium (34) | Se-81m | 4.57E-02 | 1.40E-02 | 3.56E-02 | 4.57E-02 | 1.47E-02 | 6.36E+03 | 1.52 | 4.02E+05 | 1.31E+06 | 5.16E+05 | 4.02E+05 | 1.25E+06 | 9.94E-09 |
| Selenium (34) | Se-83 | 1.44E+01 | 2.69E+00 | 7.74E+00 | 1.23E+01 | 2.67E+00 | 1.62E+04 | 1.17 | 4.21E+03 | 2.26E+04 | 7.84E+03 | 4.92E+03 | 2.27E+04 | 4.19E-11 |
| Silicon (14) | Si-31 | 1.98E-02 | 9.62E-03 | 1.47E-02 | 1.85E-02 | 8.33E-02 | 2.32E+03 | 1.15 | 4.45E+05 | 9.13E+05 | 5.98E+05 | 4.76E+05 | 1.05E+05 | 1.15E-08 |
| Silicon (14) | Si-32 | 2.97E-05 | 1.51E-05 | 2.67E-05 | 2.97E-05 | 2.92E-05 | 1.54E-03 | 1.25 | 1.18E+05 | 2.32E+05 | 1.31E+05 | 1.18E+05 | 1.20E+05 | 4.75E-03 |
| Silicon (14) | Si-32+D | 2.04E-02 | | | | | 1.54E-03 | 1.25 | 1.72E+02 | | | | | 6.93E-06 |
| Silicon (14) | Si-32+E | 2.03E-02 | 1.24E-02 | 1.69E-02 | 1.98E-02 | 9.94E-02 | 1.54E-03 | | | | | | | |
| Samarium (62) | Sm-141 | 8.00E+00 | 1.58E+00 | 4.49E+00 | 7.03E+00 | 1.62E+00 | 3.57E+04 | 1.19 | 1.65E+04 | 8.36E+04 | 2.94E+04 | 1.88E+04 | 8.14E+04 | 1.26E-10 |
| Samarium (62) | Sm-141m | 1.13E+01 | 2.20E+00 | 6.29E+00 | 9.87E+00 | 2.21E+00 | 1.61E+04 | 1.18 | 5.29E+03 | 2.72E+04 | 9.51E+03 | 6.06E+03 | 2.71E+04 | 8.98E-11 |
| Samarium (62) | Sm-142 | 3.79E-01 | 8.84E-02 | 2.29E-01 | 3.43E-01 | 1.04E-01 | 5.02E+03 | 1.23 | 4.71E+04 | 2.02E+05 | 7.78E+04 | 5.20E+04 | 1.71E+05 | 2.59E-09 |
| Samarium (62) | Sm-145 | 5.43E-02 | 3.60E-02 | 5.32E-02 | 5.43E-02 | 6.49E-02 | 7.44E-01 | 1.28 | 8.95E+01 | 1.35E+02 | 9.14E+01 | 8.95E+01 | 7.49E+01 | 3.39E-08 |
| Samarium (62) | Sm-146 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.73E-09 | 0 | | | | | | |
| Samarium (62) | Sm-147 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.54E-12 | 0 | | | | | | |
| Samarium (62) | Sm-151 | 6.75E-07 | 6.68E-07 | 6.75E-07 | 6.75E-07 | 4.13E-06 | 7.70E-03 | 1.34 | 4.86E+06 | 4.91E+06 | 4.86E+06 | 4.86E+06 | 7.94E+05 | 1.85E-01 |
| Samarium (62) | Sm-153 | 1.39E-01 | 5.17E-02 | 1.13E-01 | 1.39E-01 | 7.12E-02 | 1.30E+02 | 1.26 | 3.23E+03 | 8.72E+03 | 3.97E+03 | 3.25E+03 | 6.33E+03 | 7.38E-09 |
| Samarium (62) | Sm-155 | 3.66E-01 | 1.12E-01 | 2.76E-01 | 3.60E-01 | 1.82E-01 | 1.65E+04 | 1.25 | 1.58E+05 | 5.17E+05 | 2.10E+05 | 1.61E+05 | 3.18E+05 | 2.89E-09 |
| Samarium (62) | Sm-156 | 4.83E-01 | 1.25E-01 | 3.36E-01 | 4.68E-01 | 1.31E-01 | 6.46E+02 | 1.25 | 4.68E+03 | 1.81E+04 | 6.74E+03 | 4.83E+03 | 1.73E+04 | 2.20E-09 |
| Tin (50) | Sn-110 | 1.43E+00 | 3.21E-01 | 9.08E-01 | 1.35E+00 | 3.23E-01 | 1.52E+03 | 1.25 | 3.72E+03 | 1.66E+04 | 5.85E+03 | 3.94E+03 | 1.64E+04 | 5.24E-10 |
| Tin (50) | Sn-111 | 2.87E+00 | 5.61E-01 | 1.60E+00 | 2.50E+00 | 5.85E-01 | 1.03E+04 | 1.2 | 1.31E+04 | 6.71E+04 | 2.35E+04 | 1.51E+04 | 6.44E+04 | 2.74E-10 |
| Tin (50) | Sn-113 | 2.65E-02 | 8.39E-03 | 1.82E-02 | 2.54E-02 | 1.90E-02 | 2.20E+00 | 1.32 | 3.10E+02 | 9.79E+02 | 4.51E+02 | 3.24E+02 | 4.32E+02 | 3.10E-08 |
| Tin (50) | Sn-117m | 5.97E-01 | 1.56E-01 | 4.21E-01 | 5.86E-01 | 1.63E-01 | 1.86E+01 | 1.27 | 1.07E+02 | 4.10E+02 | 1.52E+02 | 1.09E+02 | 3.91E+02 | 1.31E-09 |
| Tin (50) | Sn-119m | 2.09E-03 | 2.03E-03 | 2.11E-03 | 2.09E-03 | 8.72E-03 | 8.63E-01 | 1.32 | 2.37E+03 | 2.44E+03 | 2.35E+03 | 2.37E+03 | 5.68E+02 | 6.34E-07 |
| Tin (50) | Sn-121 | 1.71E-04 | 6.79E-05 | 1.41E-04 | 1.70E-04 | 1.03E-04 | 2.24E+02 | 1.25 | 4.58E+06 | 1.15E+07 | 5.54E+06 | 4.62E+06 | 7.60E+06 | 4.80E-06 |
| Tin (50) | Sn-121m | 1.43E-03 | 1.27E-03 | 1.42E-03 | 1.43E-03 | 4.20E-03 | 1.26E-02 | 1.31 | 2.35E+03 | 2.66E+03 | 2.36E+03 | 2.35E+03 | 8.01E+02 | 4.39E-05 |
| Tin (50) | Sn-121m+D | 1.56E-03 | 1.32E-03 | 1.53E-03 | 1.56E-03 | 4.28E-03 | 1.26E-02 | 1 | 2.81E+03 | 3.32E+03 | 2.86E+03 | 2.81E+03 | 1.03E+03 | 5.23E-05 |
| Tin (50) | Sn-121m+E | 1.56E-03 | 1.32E-03 | 1.53E-03 | 1.56E-03 | 4.28E-03 | 1.26E-02 | | | | | | | |
| Tin (50) | Sn-123 | 5.30E-02 | 1.46E-02 | 3.15E-02 | 4.64E-02 | 7.59E-02 | 1.96E+00 | 1.16 | 1.62E+02 | 5.89E+02 | 2.72E+02 | 1.85E+02 | 1.13E+02 | 1.98E-08 |
| Tin (50) | Sn-123m | 5.91E-01 | 1.54E-01 | 4.16E-01 | 5.78E-01 | 2.02E-01 | 9.09E+03 | 1.25 | 5.40E+04 | 2.07E+05 | 7.68E+04 | 5.52E+04 | 1.58E+05 | 1.42E-09 |
| Tin (50) | Sn-125 | 1.92E+00 | 3.66E-01 | 1.02E+00 | 1.63E+00 | 4.46E-01 | 2.62E+01 | 1.16 | 5.15E+01 | 2.71E+02 | 9.66E+01 | 6.06E+01 | 2.22E+02 | 4.76E-10 |
| Tin (50) | Sn-126 | 1.30E-01 | 4.74E-02 | 1.09E-01 | 1.30E-01 | 5.62E-02 | 6.93E-06 | 1.29 | 2.61E+01 | 7.16E+01 | 3.13E+01 | 2.61E+01 | 6.03E+01 | 9.22E-04 |
| Tin (50) | Sn-126+D | 8.84E+00 | 1.81E+00 | 5.13E+00 | 7.93E+00 | 1.87E+00 | 6.93E-06 | 1.19 | 4.18E-01 | 2.05E+00 | 7.21E-01 | 4.66E-01 | 1.98E+00 | 1.48E-05 |
| Tin (50) | Sn-126+E | 1.11E+01 | 2.26E+00 | 6.42E+00 | 9.92E+00 | 2.31E+00 | 6.93E-06 | | | | | | | |
| Tin (50) | Sn-127 | 1.15E+01 | 2.11E+00 | 6.08E+00 | 9.74E+00 | 2.10E+00 | 2.89E+03 | 1.16 | 9.45E+02 | 5.17E+03 | 1.79E+03 | 1.12E+03 | 5.19E+03 | 8.06E-11 |
| Tin (50) | Sn-128 | 3.30E+00 | 7.03E-01 | 1.98E+00 | 3.00E+00 | 7.29E-01 | 6.16E+03 | 1.23 | 6.65E+03 | 3.12E+04 | 1.11E+04 | 7.31E+03 | 3.01E+04 | 2.68E-10 |
| Strontium (38) | Sr-80 | 9.94E-05 | 9.94E-05 | 9.94E-05 | 9.94E-05 | 1.87E-03 | 3.64E+03 | 1.47 | 1.09E+08 | 1.09E+08 | 1.09E+08 | 1.09E+08 | 5.82E+06 | 4.66E-06 |

| | | Toxicity and Isotope-specific Information | | | | | | | Dose Compliance Concentrations for Radionuclides in Outdoor Surfaces (SDCCs) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Element (Atomic No.)** | **Radionuclide** | **Soil Volume External Exposure DCF (Infinite Volume) (mrem/yr per pCi/g)** | **Soil Volume External Exposure DCF (1 cm) (mrem/yr per pCi/g)** | **Soil Volume External Exposure DCF (5 cm) (mrem/yr per pCi/g)** | **External Exposure DCF (15 cm) (mrem/yr per pCi/g)** | **External Exposure DCF (Ground Plane) (mrem/yr per pCi/cm$^2$)** | **Lambda** | **$F_{surf}$** | **Soil Volume Soil Volume SDCC (pCi/g)** | **Soil Volume 1cm SDCC (pCi/g)** | **Soil Volume 5cm SDCC (pCi/g)** | **Soil Volume 15cm SDCC (pCi/g)** | **Ground Plane SDCC (pCi/cm$^2$)** | **Soil Volume SDCC (mg/kg)** |
| Actinium (89) | Ac-223 | 1.98E-02 | 4.81E-03 | 1.31E-02 | 1.87E-02 | 5.16E-03 | 1.66E+05 | 1.46 | 2.51E+07 | 1.03E+08 | 3.79E+07 | 2.66E+07 | 9.61E+07 | 6.55E-08 |
| Strontium (38) | Sr-81 | 7.53E+00 | 1.59E+00 | 4.48E+00 | 6.83E+00 | 1.67E+00 | 1.43E+04 | 1.2 | 6.90E+03 | 3.27E+04 | 1.16E+04 | 7.61E+03 | 3.11E+04 | 7.59E-11 |
| Strontium (38) | Sr-82 | 9.77E-05 | 9.77E-05 | 9.77E-05 | 9.77E-05 | 1.83E-03 | 1.01E+01 | 1.47 | 3.09E+05 | 3.09E+05 | 3.09E+05 | 3.09E+05 | 1.65E+04 | 4.86E-06 |
| Strontium (38) | Sr-82+D | 6.12E+00 | 1.28E+00 | 3.60E+00 | 5.54E+00 | 1.40E+00 | 1.01E+01 | 1.2 | 6.04E+00 | 2.88E+01 | 1.03E+01 | 6.67E+00 | 2.64E+01 | 9.50E-11 |
| Strontium (38) | Sr-82+E | 6.12E+00 | 1.28E+00 | 3.60E+00 | 5.54E+00 | 1.40E+00 | 1.01E+01 | | | | | | | |
| Strontium (38) | Sr-83 | 4.49E+00 | 8.88E-01 | 2.54E+00 | 3.97E+00 | 8.88E-01 | 1.87E+02 | 1.24 | 1.48E+02 | 7.48E+02 | 2.62E+02 | 1.67E+02 | 7.48E+02 | 1.27E-10 |
| Strontium (38) | Sr-85 | 2.76E+00 | 5.71E-01 | 1.63E+00 | 2.50E+00 | 5.65E-01 | 3.90E+00 | 1.25 | 5.04E+00 | 2.44E+01 | 8.54E+00 | 5.56E+00 | 2.46E+01 | 2.13E-10 |
| Strontium (38) | Sr-85m | 1.04E+00 | 2.42E-01 | 6.86E-01 | 9.98E-01 | 2.36E-01 | 5.24E+03 | 1.25 | 1.77E+04 | 7.57E+04 | 2.67E+04 | 1.84E+04 | 7.78E+04 | 5.56E-10 |
| Strontium (38) | Sr-87m | 1.68E+00 | 3.60E-01 | 1.03E+00 | 1.56E+00 | 3.55E-01 | 2.16E+03 | 1.23 | 4.58E+03 | 2.14E+04 | 7.51E+03 | 4.95E+03 | 2.18E+04 | 3.58E-10 |
| Strontium (38) | Sr-89 | 1.51E-02 | 8.97E-03 | 1.24E-02 | 1.47E-02 | 8.01E-02 | 5.01E+00 | 1.17 | 1.25E+03 | 2.10E+03 | 1.51E+03 | 1.28E+03 | 2.35E+02 | 4.31E-08 |
| Strontium (38) | Sr-90 | 6.45E-04 | 2.35E-04 | 5.07E-04 | 6.36E-04 | 1.91E-03 | 2.38E-02 | 1.25 | 5.48E+03 | 1.50E+04 | 6.97E+03 | 5.56E+03 | 1.85E+03 | 4.02E-05 |
| Strontium (38) | Sr-90+D | 4.07E-02 | 2.37E-02 | 3.30E-02 | 3.94E-02 | 1.31E-01 | 2.38E-02 | 1.4 | 7.79E+01 | 1.34E+02 | 9.60E+01 | 8.05E+01 | 2.42E+01 | 5.72E-07 |
| Strontium (38) | Sr-90+E | 4.07E-02 | 2.37E-02 | 3.30E-02 | 3.94E-02 | 1.31E-01 | 2.38E-02 | | | | | | | |
| Strontium (38) | Sr-91 | 4.12E+00 | 7.91E-01 | 2.26E+00 | 3.58E+00 | 8.48E-01 | 6.39E+02 | 1.17 | 5.79E+02 | 3.02E+03 | 1.06E+03 | 6.66E+02 | 2.81E+03 | 1.60E-10 |
| Strontium (38) | Sr-92 | 8.30E+00 | 1.46E+00 | 4.25E+00 | 6.90E+00 | 1.44E+00 | 2.24E+03 | 1.15 | 1.03E+03 | 5.82E+03 | 2.00E+03 | 1.24E+03 | 5.94E+03 | 8.19E-11 |
| Tantalum (73) | Ta-172 | 8.78E+00 | 1.71E+00 | 4.85E+00 | 7.61E+00 | 1.74E+00 | 9.90E+03 | 1.18 | 4.19E+03 | 2.16E+04 | 7.60E+03 | 4.84E+03 | 2.12E+04 | 1.41E-10 |
| Tantalum (73) | Ta-173 | 2.98E+00 | 6.34E-01 | 1.75E+00 | 2.67E+00 | 6.71E-01 | 1.66E+03 | 1.2 | 2.03E+03 | 9.57E+03 | 3.47E+03 | 2.27E+03 | 9.04E+03 | 4.10E-10 |
| Tantalum (73) | Ta-174 | 3.21E+00 | 6.86E-01 | 1.90E+00 | 2.89E+00 | 7.18E-01 | 5.06E+03 | 1.2 | 5.74E+03 | 2.68E+04 | 9.68E+03 | 6.37E+03 | 2.57E+04 | 3.83E-10 |
| Tantalum (73) | Ta-175 | 5.18E+00 | 9.96E-01 | 2.82E+00 | 4.42E+00 | 9.91E-01 | 5.78E+02 | 1.17 | 4.16E+02 | 2.17E+03 | 7.66E+02 | 4.88E+02 | 2.18E+03 | 2.44E-10 |
| Tantalum (73) | Ta-176 | 1.32E+01 | 2.29E+00 | 6.64E+00 | 1.08E+01 | 2.25E+00 | 7.51E+02 | 1.22 | 2.06E+02 | 1.18E+03 | 4.08E+02 | 2.50E+02 | 1.20E+03 | 9.35E-11 |
| Tantalum (73) | Ta-177 | 1.57E-01 | 5.73E-02 | 1.23E-01 | 1.51E-01 | 6.85E-02 | 1.07E+02 | 1.27 | 2.36E+03 | 6.48E+03 | 3.01E+03 | 2.46E+03 | 5.41E+03 | 7.56E-09 |
| Tantalum (73) | Ta-178 | 4.16E-01 | 1.02E-01 | 2.52E-01 | 3.62E-01 | 1.12E-01 | 3.91E+04 | | | | | | | |
| Tantalum (73) | Ta-178m | 4.79E+00 | 1.11E+00 | 3.06E+00 | 4.49E+00 | 1.11E+00 | 2.76E+03 | | | | | | | |
| Tantalum (73) | Ta-179 | 4.87E-02 | 2.48E-02 | 4.57E-02 | 4.87E-02 | 3.21E-02 | 3.80E-01 | 1.3 | 8.34E+01 | 1.64E+02 | 8.89E+01 | 8.34E+01 | 1.27E+02 | 7.62E-08 |
| Tantalum (73) | Ta-180 | 2.57E+00 | 6.04E-01 | 1.67E+00 | 2.44E+00 | 6.05E-01 | 6.93E-14 | 1.23 | 1.38E+00 | 5.89E+00 | 2.13E+00 | 1.46E+00 | 5.89E+00 | 6.98E+03 |
| Tantalum (73) | Ta-180m | 8.17E-02 | 3.86E-02 | 7.46E-02 | 8.17E-02 | 4.94E-02 | 7.49E+02 | 1.28 | 3.13E+04 | 6.62E+04 | 3.43E+04 | 3.13E+04 | 5.18E+04 | 1.46E-08 |
| Tantalum (73) | Ta-182 | 7.50E+00 | 1.41E+00 | 4.03E+00 | 6.40E+00 | 1.40E+00 | 2.20E+00 | 1.17 | 1.24E+00 | 6.58E+00 | 2.30E+00 | 1.45E+00 | 6.63E+00 | 1.99E-10 |
| Tantalum (73) | Ta-182m | 9.42E-01 | 2.56E-01 | 6.70E-01 | 9.18E-01 | 2.63E-01 | 2.30E+04 | 1.25 | 8.53E+04 | 3.14E+05 | 1.20E+05 | 8.75E+04 | 3.06E+05 | 1.31E-09 |
| Tantalum (73) | Ta-183 | 1.20E+00 | 3.04E-01 | 8.11E-01 | 1.15E+00 | 3.13E-01 | 4.96E+01 | 1.24 | 1.46E+02 | 5.74E+02 | 2.15E+02 | 1.52E+02 | 5.58E+02 | 1.05E-09 |
| Tantalum (73) | Ta-184 | 8.80E+00 | 1.80E+00 | 5.13E+00 | 7.89E+00 | 1.81E+00 | 6.98E+02 | 1.19 | 2.91E+02 | 1.42E+03 | 4.99E+02 | 3.24E+02 | 1.42E+03 | 1.49E-10 |
| Tantalum (73) | Ta-185 | 7.98E-01 | 2.09E-01 | 5.39E-01 | 7.57E-01 | 2.92E-01 | 7.43E+03 | 1.24 | 3.29E+04 | 1.26E+05 | 4.88E+04 | 3.47E+04 | 9.01E+04 | 1.59E-09 |
| Tantalum (73) | Ta-186 | 8.43E+00 | 1.76E+00 | 4.98E+00 | 7.61E+00 | 1.84E+00 | 3.47E+04 | 1.2 | 1.50E+04 | 7.19E+04 | 2.55E+04 | 1.67E+04 | 6.88E+04 | 1.57E-10 |
| Terbium (65) | Tb-147 | 9.12E+00 | 1.78E+00 | 5.05E+00 | 7.96E+00 | 1.81E+00 | 3.68E+03 | 1.18 | 1.50E+03 | 7.68E+03 | 2.70E+03 | 1.72E+03 | 7.56E+03 | 1.16E-10 |
| Terbium (65) | Tb-149 | 9.47E+00 | 1.77E+00 | 5.07E+00 | 8.08E+00 | 1.75E+00 | 1.46E+03 | 1.17 | 5.79E+02 | 3.10E+03 | 1.08E+03 | 6.79E+02 | 3.13E+03 | 1.14E-10 |
| Terbium (65) | Tb-150 | 9.75E+00 | 1.88E+00 | 5.35E+00 | 8.45E+00 | 1.89E+00 | 1.86E+03 | 1.18 | 7.08E+02 | 3.66E+03 | 1.29E+03 | 8.17E+02 | 3.65E+03 | 1.11E-10 |
| Terbium (65) | Tb-151 | 4.59E+00 | 9.72E-01 | 2.72E+00 | 4.16E+00 | 9.78E-01 | 3.45E+02 | 1.2 | 2.74E+02 | 1.29E+03 | 4.61E+02 | 3.02E+02 | 1.28E+03 | 2.32E-10 |
| Terbium (65) | Tb-153 | 9.18E-01 | 2.28E-01 | 5.97E-01 | 8.56E-01 | 2.44E-01 | 1.08E+02 | 1.23 | 4.19E+02 | 1.69E+03 | 6.44E+02 | 4.49E+02 | 1.58E+03 | 1.15E-09 |
| Terbium (65) | Tb-154 | 1.47E+01 | 2.50E+00 | 7.24E+00 | 1.19E+01 | 2.43E+00 | 2.84E+02 | 1.14 | 7.41E+01 | 4.35E+02 | 1.50E+02 | 9.15E+01 | 4.48E+02 | 7.80E-11 |
| Terbium (65) | Tb-155 | 4.20E-01 | 1.27E-01 | 3.08E-01 | 4.08E-01 | 1.46E-01 | 4.75E+01 | 1.25 | 3.96E+02 | 1.31E+03 | 5.40E+02 | 4.07E+02 | 1.14E+03 | 2.50E-09 |
| Terbium (65) | Tb-156 | 1.04E+01 | 2.00E+00 | 5.69E+00 | 8.99E+00 | 1.97E+00 | 4.74E+01 | 1.18 | 1.69E+01 | 8.85E+01 | 3.10E+01 | 1.96E+01 | 8.95E+01 | 1.08E-10 |
| Terbium (65) | Tb-156m | 2.97E-02 | 1.76E-02 | 2.89E-02 | 2.97E-02 | 2.58E-02 | 2.49E+02 | 1.27 | 2.90E+04 | 4.89E+04 | 2.98E+04 | 2.90E+04 | 3.33E+04 | 3.53E-08 |
| Terbium (65) | Tb-156n | 5.46E-03 | 2.63E-03 | 4.90E-03 | 5.46E-03 | 3.68E-03 | 1.21E+03 | 1.27 | 7.67E+05 | 1.59E+06 | 8.55E+05 | 7.67E+05 | 1.14E+06 | 1.91E-07 |
| Terbium (65) | Tb-157 | 2.31E-03 | 1.53E-03 | 2.28E-03 | 2.31E-03 | 2.57E-03 | 4.62E-03 | 1.27 | 1.49E+03 | 2.26E+03 | 1.52E+03 | 1.49E+03 | 1.34E+03 | 9.83E-05 |
| Terbium (65) | Tb-158 | 4.46E+00 | 8.67E-01 | 2.46E+00 | 3.86E+00 | 8.74E-01 | 4.62E-03 | 1.18 | 8.35E-01 | 4.29E+00 | 1.51E+00 | 9.65E-01 | 4.26E+00 | 5.54E-08 |
| Terbium (65) | Tb-160 | 6.53E+00 | 1.24E+00 | 3.56E+00 | 5.63E+00 | 1.24E+00 | 3.50E+00 | 1.17 | 2.06E+00 | 1.08E+01 | 3.78E+00 | 2.39E+00 | 1.09E+01 | 1.83E-10 |
| Terbium (65) | Tb-161 | 4.64E-02 | 2.29E-02 | 4.20E-02 | 4.61E-02 | 3.44E-02 | 3.66E+01 | 1.29 | 2.68E+03 | 5.42E+03 | 2.96E+03 | 2.70E+03 | 3.61E+03 | 2.28E-08 |
| Technetium (43) | Tc-101 | 1.73E+00 | 3.80E-01 | 1.08E+00 | 1.62E+00 | 4.26E-01 | 2.57E+04 | 1.22 | 5.33E+04 | 2.43E+05 | 8.56E+04 | 5.71E+04 | 2.17E+05 | 4.08E-10 |
| Technetium (43) | Tc-104 | 1.22E+01 | 2.22E+00 | 6.34E+00 | 1.02E+01 | 2.28E+00 | 2.00E+04 | 1.16 | 6.23E+03 | 3.41E+04 | 1.19E+04 | 7.43E+03 | 3.33E+04 | 6.28E-11 |
| Technetium (43) | Tc-93 | 9.06E+00 | 1.58E+00 | 4.59E+00 | 7.48E+00 | 1.54E+00 | 2.21E+03 | 1.17 | 9.14E+02 | 5.26E+03 | 1.81E+03 | 1.11E+03 | 5.38E+03 | 7.47E-11 |
| Technetium (43) | Tc-93m | 4.49E+00 | 7.65E-01 | 2.24E+00 | 3.66E+00 | 7.35E-01 | 8.37E+03 | 1.16 | 7.03E+03 | 4.13E+04 | 1.41E+04 | 8.64E+03 | 4.30E+04 | 1.51E-10 |

| | | Toxicity and Isotope-specific Information | | | | | | | Dose Compliance Concentrations for Radionuclides in Outdoor Surfaces (SDCCs) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Element (Atomic No.)** | **Radionuclide** | **Soil Volume External Exposure DCF (Infinite Volume) (mrem/yr per pCi/g)** | **Soil Volume External Exposure DCF (1 cm) (mrem/yr per pCi/g)** | **Soil Volume External Exposure DCF (5 cm) (mrem/yr per pCi/g)** | **External Exposure DCF (15 cm) (mrem/yr per pCi/g)** | **External Exposure DCF (Ground Plane) (mrem/yr per pCi/cm$^2$)** | **Lambda** | **$F_{surf}$** | **Soil Volume Soil Volume SDCC (pCi/g)** | **Soil Volume 1cm SDCC (pCi/g)** | **Soil Volume 5cm SDCC (pCi/g)** | **Soil Volume 15cm SDCC (pCi/g)** | **Ground Plane SDCC (pCi/cm$^2$)** | **Soil Volume SDCC (mg/kg)** |
| Actinium (89) | Ac-223 | 1.98E-02 | 4.81E-03 | 1.31E-02 | 1.87E-02 | 5.16E-03 | 1.66E+05 | 1.46 | 2.51E+07 | 1.03E+08 | 3.79E+07 | 2.66E+07 | 9.61E+07 | 6.55E-08 |
| Technetium (43) | Tc-94 | 1.54E+01 | 2.98E+00 | 8.56E+00 | 1.35E+01 | 2.95E+00 | 1.24E+03 | 1.19 | 2.98E+02 | 1.54E+03 | 5.36E+02 | 3.40E+02 | 1.55E+03 | 4.37E-11 |
| Technetium (43) | Tc-94m | 1.09E+01 | 2.09E+00 | 5.95E+00 | 9.42E+00 | 2.12E+00 | 7.00E+03 | 1.18 | 2.39E+03 | 1.24E+04 | 4.37E+03 | 2.76E+03 | 1.22E+04 | 6.23E-11 |
| Technetium (43) | Tc-95 | 4.53E+00 | 8.82E-01 | 2.54E+00 | 3.97E+00 | 8.75E-01 | 3.04E+02 | 1.21 | 2.43E+02 | 1.25E+03 | 4.34E+02 | 2.77E+02 | 1.26E+03 | 1.47E-10 |
| Technetium (43) | Tc-95m | 3.67E+00 | 7.44E-01 | 2.13E+00 | 3.28E+00 | 7.38E-01 | 4.15E+00 | 1.22 | 4.11E+00 | 2.03E+01 | 7.10E+00 | 4.60E+00 | 2.05E+01 | 1.83E-10 |
| Technetium (43) | Tc-96 | 1.45E+01 | 2.80E+00 | 8.02E+00 | 1.27E+01 | 2.77E+00 | 5.91E+01 | 1.19 | 1.50E+01 | 7.80E+01 | 2.72E+01 | 1.72E+01 | 7.88E+01 | 4.74E-11 |
| Technetium (43) | Tc-96m | 2.65E-01 | 5.04E-02 | 1.44E-01 | 2.28E-01 | 5.25E-02 | 7.07E+03 | 1.29 | 9.06E+04 | 4.77E+05 | 1.67E+05 | 1.05E+05 | 4.57E+05 | 2.39E-09 |
| Technetium (43) | Tc-97 | 5.63E-04 | 5.67E-04 | 5.63E-04 | 5.63E-04 | 5.43E-03 | 2.67E-07 | 1.38 | 5.63E+03 | 5.59E+03 | 5.63E+03 | 5.63E+03 | 5.84E+02 | 3.98E+00 |
| Technetium (43) | Tc-97m | 1.53E-03 | 8.82E-04 | 1.34E-03 | 1.53E-03 | 5.19E-03 | 2.91E+00 | 1.37 | 6.43E+03 | 1.12E+04 | 7.35E+03 | 6.42E+03 | 1.90E+03 | 4.16E-07 |
| Technetium (43) | Tc-98 | 8.06E+00 | 1.59E+00 | 4.57E+00 | 7.14E+00 | 1.58E+00 | 1.65E-07 | 1.19 | 4.58E-01 | 2.32E+00 | 8.08E-01 | 5.17E-01 | 2.34E+00 | 5.28E-04 |
| Technetium (43) | Tc-99 | 1.08E-04 | 4.64E-05 | 9.21E-05 | 1.08E-04 | 7.55E-05 | 3.25E-06 | 1.25 | 3.23E+04 | 7.52E+04 | 3.79E+04 | 3.24E+04 | 4.63E+04 | 1.91E+00 |
| Technetium (43) | Tc-99m | 5.02E-01 | 1.35E-01 | 3.64E-01 | 4.96E-01 | 1.33E-01 | 1.01E+03 | 1.26 | 6.99E+03 | 2.61E+04 | 9.65E+03 | 7.07E+03 | 2.64E+04 | 1.33E-09 |
| Tellurium (52) | Te-116 | 1.73E-01 | 5.17E-02 | 1.24E-01 | 1.65E-01 | 7.07E-02 | 2.44E+03 | 1.3 | 4.77E+04 | 1.60E+05 | 6.66E+04 | 4.99E+04 | 1.17E+05 | 4.41E-09 |
| Tellurium (52) | Te-121 | 3.10E+00 | 6.36E-01 | 1.81E+00 | 2.80E+00 | 6.38E-01 | 1.49E+01 | 1.21 | 1.74E+01 | 8.45E+01 | 2.98E+01 | 1.92E+01 | 8.42E+01 | 2.74E-10 |
| Tellurium (52) | Te-121m | 9.90E-01 | 2.28E-01 | 6.36E-01 | 9.34E-01 | 2.31E-01 | 1.64E+00 | 1.24 | 7.25E+00 | 3.15E+01 | 1.13E+01 | 7.68E+00 | 3.11E+01 | 1.04E-09 |
| Tellurium (52) | Te-123 | 4.63E-03 | 4.42E-03 | 4.64E-03 | 4.63E-03 | 1.66E-02 | 6.93E-14 | 1.31 | 7.23E+02 | 7.56E+02 | 7.20E+02 | 7.23E+02 | 2.02E+02 | 2.49E+06 |
| Tellurium (52) | Te-123m | 5.71E-01 | 1.49E-01 | 4.03E-01 | 5.60E-01 | 1.54E-01 | 2.11E+00 | 1.26 | 1.46E+01 | 5.59E+01 | 2.07E+01 | 1.49E+01 | 5.41E+01 | 1.65E-09 |
| Tellurium (52) | Te-125m | 1.11E-02 | 9.59E-03 | 1.08E-02 | 1.11E-02 | 3.10E-02 | 4.36E+00 | 1.31 | 1.34E+03 | 1.55E+03 | 1.37E+03 | 1.34E+03 | 4.78E+02 | 7.43E-08 |
| Tellurium (52) | Te-127 | 2.67E-02 | 5.91E-03 | 1.64E-02 | 2.46E-02 | 1.20E-02 | 6.49E+02 | 1.21 | 8.80E+04 | 3.97E+05 | 1.43E+05 | 9.53E+04 | 1.95E+05 | 3.34E-08 |
| Tellurium (52) | Te-127m | 4.16E-03 | 3.13E-03 | 3.84E-03 | 4.10E-03 | 9.99E-03 | 2.32E+00 | 1.31 | 2.08E+03 | 2.75E+03 | 2.25E+03 | 2.10E+03 | 8.64E+02 | 2.20E-07 |
| Tellurium (52) | Te-129 | 3.13E-01 | 6.98E-02 | 1.87E-01 | 2.83E-01 | 1.33E-01 | 5.23E+03 | 1.23 | 5.97E+04 | 2.68E+05 | 1.00E+05 | 6.60E+04 | 1.41E+05 | 2.85E-09 |
| Tellurium (52) | Te-129m | 1.75E-01 | 3.84E-02 | 1.01E-01 | 1.56E-01 | 6.65E-02 | 7.53E+00 | 1.25 | 1.51E+02 | 6.87E+02 | 2.60E+02 | 1.69E+02 | 3.97E+02 | 5.01E-09 |
| Tellurium (52) | Te-131 | 2.24E+00 | 4.77E-01 | 1.33E+00 | 2.01E+00 | 5.53E-01 | 1.46E+04 | 1.2 | 2.38E+04 | 1.12E+05 | 4.00E+04 | 2.64E+04 | 9.63E+04 | 4.15E-10 |
| Tellurium (52) | Te-131m | 8.24E+00 | 1.58E+00 | 4.53E+00 | 7.16E+00 | 1.56E+00 | 2.02E+02 | 1.18 | 9.12E+01 | 4.75E+02 | 1.66E+02 | 1.05E+02 | 4.81E+02 | 1.15E-10 |
| Tellurium (52) | Te-132 | 9.94E-01 | 2.39E-01 | 6.60E-01 | 9.55E-01 | 2.47E-01 | 7.76E+01 | 1.25 | 2.73E+02 | 1.14E+03 | 4.11E+02 | 2.84E+02 | 1.10E+03 | 9.01E-10 |
| Tellurium (52) | Te-133 | 5.37E+00 | 1.05E+00 | 3.00E+00 | 4.70E+00 | 1.12E+00 | 2.93E+04 | 1.18 | 2.02E+04 | 1.03E+05 | 3.62E+04 | 2.31E+04 | 9.70E+04 | 1.78E-10 |
| Tellurium (52) | Te-133m | 1.36E+01 | 2.57E+00 | 7.39E+00 | 1.17E+01 | 2.61E+00 | 6.57E+03 | 1.17 | 1.81E+03 | 9.54E+03 | 3.32E+03 | 2.10E+03 | 9.39E+03 | 7.10E-11 |
| Tellurium (52) | Te-134 | 4.76E+00 | 9.87E-01 | 2.80E+00 | 4.29E+00 | 9.90E-01 | 8.71E+03 | 1.2 | 6.68E+03 | 3.22E+04 | 1.14E+04 | 7.41E+03 | 3.21E+04 | 1.99E-10 |
| () | Test Isotope | | | | | | | | | | | | | |
| Thorium (90) | Th-226 | 3.02E-02 | 8.21E-03 | 2.18E-02 | 2.95E-02 | 8.46E-03 | 1.18E+04 | 1.39 | 1.23E+06 | 4.52E+06 | 1.70E+06 | 1.26E+06 | 4.38E+06 | 4.56E-08 |
| Thorium (90) | Th-227 | 4.79E-01 | 1.13E-01 | 3.15E-01 | 4.57E-01 | 1.14E-01 | 1.35E+01 | 1.34 | 9.22E+01 | 3.90E+02 | 1.40E+02 | 9.67E+01 | 3.86E+02 | 3.00E-09 |
| Thorium (90) | Th-228 | 7.16E-03 | 2.09E-03 | 5.32E-03 | 7.03E-03 | 2.49E-03 | 3.62E-01 | 1.44 | 5.08E+02 | 1.74E+03 | 6.85E+02 | 5.17E+02 | 1.46E+03 | 6.20E-07 |
| Thorium (90) | Th-229 | 2.89E-01 | 8.69E-02 | 2.20E-01 | 2.85E-01 | 9.21E-02 | 9.44E-05 | 1.4 | 1.08E+01 | 3.61E+01 | 1.42E+01 | 1.10E+01 | 3.40E+01 | 5.10E-05 |
| Thorium (90) | Th-229+D | 1.48E+00 | | | | | 9.44E-05 | 1.16 | 2.56E+00 | | | | | 1.20E-05 |
| Thorium (90) | Th-229+E | 1.48E+00 | 3.47E-01 | 9.38E-01 | 1.37E+00 | 4.04E-01 | 9.44E-05 | | | | | | | |
| Thorium (90) | Th-230 | 1.07E-03 | 3.84E-04 | 8.62E-04 | 1.06E-03 | 7.43E-04 | 9.00E-06 | 1.45 | 2.83E+03 | 7.88E+03 | 3.51E+03 | 2.87E+03 | 4.07E+03 | 1.40E-01 |
| Thorium (90) | Th-231 | 3.21E-02 | 1.16E-02 | 2.63E-02 | 3.19E-02 | 1.81E-02 | 2.38E+02 | 1.41 | 2.30E+04 | 6.38E+04 | 2.81E+04 | 2.32E+04 | 4.08E+04 | 4.34E-08 |
| Thorium (90) | Th-232 | 4.55E-04 | 1.87E-04 | 3.82E-04 | 4.51E-04 | 5.31E-04 | 4.93E-11 | 1.45 | 6.64E+03 | 1.62E+04 | 7.90E+03 | 6.69E+03 | 5.69E+03 | 6.06E+04 |
| Thorium (90) | Th-232+D | | | | | | 4.93E-11 | | | | | | | |
| Thorium (90) | Th-234 | 2.13E-02 | 7.63E-03 | 1.77E-02 | 2.13E-02 | 8.74E-03 | 1.05E+01 | 1.39 | 1.55E+03 | 4.33E+03 | 1.87E+03 | 1.55E+03 | 3.78E+03 | 6.72E-08 |
| Thorium (90) | Th-234+D | 1.55E-01 | 4.59E-02 | 9.96E-02 | 1.40E-01 | 1.41E-01 | 1.05E+01 | 1.15 | 2.57E+02 | 8.71E+02 | 4.01E+02 | 2.85E+02 | 2.83E+02 | 1.11E-08 |
| Thorium (90) | Th-234+E | 1.55E-01 | 4.59E-02 | 9.96E-02 | 1.40E-01 | 1.41E-01 | 1.05E+01 | | | | | | | |
| Titanium (22) | Ti-44 | 3.13E-01 | 1.24E-01 | 2.74E-01 | 3.13E-01 | 1.38E-01 | 1.47E-02 | 1.26 | 1.12E+01 | 2.82E+01 | 1.28E+01 | 1.12E+01 | 2.55E+01 | 6.53E-08 |
| Titanium (22) | Ti-44+D | 1.27E+01 | 2.52E+00 | 7.14E+00 | 1.12E+01 | 2.57E+00 | 1.47E-02 | 1.17 | 2.97E-01 | 1.50E+00 | 5.30E-01 | 3.39E-01 | 1.47E+00 | 1.73E-09 |
| Titanium (22) | Ti-44+E | 1.27E+01 | 2.52E+00 | 7.14E+00 | 1.12E+01 | 2.57E+00 | 1.47E-02 | | | | | | | |
| Titanium (22) | Ti-45 | 4.77E+00 | 9.88E-01 | 2.82E+00 | 4.35E+00 | 1.01E+00 | 1.97E+03 | 1.2 | 1.51E+03 | 7.28E+03 | 2.55E+03 | 1.66E+03 | 7.12E+03 | 6.68E-11 |
| Thallium (81) | Tl-194 | 4.08E+00 | 8.63E-01 | 2.42E+00 | 3.71E+00 | 8.58E-01 | 1.10E+04 | 1.21 | 9.76E+03 | 4.62E+04 | 1.64E+04 | 1.07E+04 | 4.65E+04 | 3.33E-10 |
| Thallium (81) | Tl-194m | 1.26E+01 | 2.61E+00 | 7.39E+00 | 1.14E+01 | 2.60E+00 | 1.11E+04 | 1.2 | 3.20E+03 | 1.55E+04 | 5.48E+03 | 3.56E+03 | 1.55E+04 | 1.08E-10 |
| Thallium (81) | Tl-195 | 7.50E+00 | 1.37E+00 | 3.94E+00 | 6.29E+00 | 1.35E+00 | 5.23E+03 | 1.2 | 2.56E+03 | 1.40E+04 | 4.87E+03 | 3.05E+03 | 1.42E+04 | 1.85E-10 |
| Thallium (81) | Tl-197 | 2.07E+00 | 4.38E-01 | 1.21E+00 | 1.83E+00 | 4.40E-01 | 2.14E+03 | 1.22 | 3.70E+03 | 1.75E+04 | 6.32E+03 | 4.18E+03 | 1.74E+04 | 6.61E-10 |

| | | Toxicity and Isotope-specific Information | | | | | | | Dose Compliance Concentrations for Radionuclides in Outdoor Surfaces (SDCCs) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Element (Atomic No.) | Radionuclide | Soil Volume External Exposure DCF (Infinite Volume) (mrem/yr per pCi/g) | Soil Volume External Exposure DCF (1 cm) (mrem/yr per pCi/g) | Soil Volume External Exposure DCF (5 cm) (mrem/yr per pCi/g) | External Exposure DCF (15 cm) (mrem/yr per pCi/g) | External Exposure DCF (Ground Plane) (mrem/yr per pCi/cm$^2$) | Lambda | $F_{surf}$ | Soil Volume Soil Volume SDCC (pCi/g) | Soil Volume 1cm SDCC (pCi/g) | Soil Volume 5cm SDCC (pCi/g) | Soil Volume 15cm SDCC (pCi/g) | Ground Plane SDCC (pCi/cm$^2$) | Soil Volume SDCC (mg/kg) |
| Actinium (89) | Ac-223 | 1.98E-02 | 4.81E-03 | 1.31E-02 | 1.87E-02 | 5.16E-03 | 1.66E+05 | 1.46 | 2.51E+07 | 1.03E+08 | 3.79E+07 | 2.66E+07 | 9.61E+07 | 6.55E-08 |
| Thallium (81) | Tl-198 | 1.20E+01 | 2.18E+00 | 6.27E+00 | 1.01E+01 | 2.12E+00 | 1.15E+03 | 1.17 | 3.58E+02 | 1.97E+03 | 6.87E+02 | 4.28E+02 | 2.03E+03 | 1.20E-10 |
| Thallium (81) | Tl-198m | 6.34E+00 | 1.33E+00 | 3.77E+00 | 5.76E+00 | 1.32E+00 | 3.25E+03 | 1.22 | 1.84E+03 | 8.76E+03 | 3.10E+03 | 2.02E+03 | 8.85E+03 | 2.18E-10 |
| Thallium (81) | Tl-199 | 1.08E+00 | 2.61E-01 | 7.01E-01 | 1.01E+00 | 2.65E-01 | 8.18E+02 | 1.26 | 2.62E+03 | 1.09E+04 | 4.04E+03 | 2.81E+03 | 1.07E+04 | 1.23E-09 |
| Thallium (81) | Tl-200 | 7.42E+00 | 1.44E+00 | 4.12E+00 | 6.45E+00 | 1.42E+00 | 2.33E+02 | 1.19 | 1.16E+02 | 5.96E+02 | 2.08E+02 | 1.33E+02 | 6.03E+02 | 1.93E-10 |
| Thallium (81) | Tl-201 | 2.44E-01 | 8.54E-02 | 2.00E-01 | 2.42E-01 | 9.29E-02 | 8.31E+01 | 1.36 | 1.10E+03 | 3.13E+03 | 1.34E+03 | 1.10E+03 | 2.88E+03 | 5.14E-09 |
| Thallium (81) | Tl-202 | 2.33E+00 | 5.15E-01 | 1.43E+00 | 2.14E+00 | 5.13E-01 | 2.07E+01 | 1.23 | 3.16E+01 | 1.43E+02 | 5.14E+01 | 3.43E+01 | 1.43E+02 | 5.98E-10 |
| Thallium (81) | Tl-204 | 3.88E-03 | 1.65E-03 | 3.30E-03 | 3.86E-03 | 1.26E-02 | 1.83E-01 | 1.39 | 8.92E+02 | 2.10E+03 | 1.05E+03 | 8.97E+02 | 2.75E+02 | 1.93E-06 |
| Thallium (81) | Tl-206 | 1.26E-02 | 7.48E-03 | 1.04E-02 | 1.23E-02 | 7.08E-02 | 8.67E+04 | 1.34 | 2.26E+07 | 3.80E+07 | 2.73E+07 | 2.32E+07 | 4.02E+06 | 1.04E-07 |
| Thallium (81) | Tl-207 | 2.29E-02 | 8.47E-03 | 1.54E-02 | 2.11E-02 | 6.49E-02 | 7.64E+04 | 1.17 | 1.24E+07 | 3.36E+07 | 1.84E+07 | 1.35E+07 | 4.39E+06 | 6.53E-08 |
| Thallium (81) | Tl-208 | 2.18E+01 | 3.56E+00 | 1.04E+01 | 1.73E+01 | 3.47E+00 | 1.19E+05 | 1.13 | 2.11E+04 | 1.29E+05 | 4.42E+04 | 2.65E+04 | 1.33E+05 | 7.17E-11 |
| Thallium (81) | Tl-209 | 1.22E+01 | 2.22E+00 | 6.40E+00 | 1.03E+01 | 2.24E+00 | 1.66E+05 | 1.16 | 5.11E+04 | 2.81E+05 | 9.76E+04 | 6.09E+04 | 2.79E+05 | 1.25E-10 |
| Thulium (69) | Tm-162 | 1.08E+01 | 1.92E+00 | 5.52E+00 | 8.93E+00 | 1.90E+00 | 1.68E+04 | 1.17 | 5.84E+03 | 3.29E+04 | 1.14E+04 | 7.06E+03 | 3.32E+04 | 1.09E-10 |
| Thulium (69) | Tm-166 | 1.12E+01 | 2.01E+00 | 5.80E+00 | 9.33E+00 | 1.98E+00 | 7.88E+02 | 1.16 | 2.67E+02 | 1.48E+03 | 5.14E+02 | 3.20E+02 | 1.50E+03 | 1.09E-10 |
| Thulium (69) | Tm-167 | 5.07E-01 | 1.40E-01 | 3.52E-01 | 4.89E-01 | 1.53E-01 | 2.74E+01 | 1.24 | 1.90E+02 | 6.90E+02 | 2.73E+02 | 1.97E+02 | 6.30E+02 | 2.25E-09 |
| Thulium (69) | Tm-170 | 1.41E-02 | 6.17E-03 | 1.21E-02 | 1.40E-02 | 3.08E-02 | 1.97E+00 | 1.26 | 5.64E+02 | 1.29E+03 | 6.55E+02 | 5.66E+02 | 2.58E+02 | 9.47E-08 |
| Thulium (69) | Tm-171 | 9.38E-04 | 4.89E-04 | 8.86E-04 | 9.38E-04 | 6.48E-04 | 3.61E-01 | 1.27 | 4.39E+03 | 8.42E+03 | 4.65E+03 | 4.39E+03 | 6.35E+03 | 4.03E-06 |
| Thulium (69) | Tm-172 | 2.91E+00 | 5.26E-01 | 1.51E+00 | 2.42E+00 | 5.68E-01 | 9.55E+01 | 1.15 | 1.25E+02 | 6.89E+02 | 2.41E+02 | 1.50E+02 | 6.38E+02 | 4.36E-10 |
| Thulium (69) | Tm-173 | 2.03E+00 | 4.38E-01 | 1.24E+00 | 1.88E+00 | 4.53E-01 | 7.37E+02 | 1.21 | 1.31E+03 | 6.08E+03 | 2.14E+03 | 1.41E+03 | 5.88E+03 | 5.97E-10 |
| Thulium (69) | Tm-175 | 5.99E+00 | 1.18E+00 | 3.38E+00 | 5.26E+00 | 1.21E+00 | 2.40E+04 | 1.18 | 1.48E+04 | 7.51E+04 | 2.63E+04 | 1.69E+04 | 7.30E+04 | 2.10E-10 |
| Uranium (92) | U-230 | 3.95E-03 | 1.17E-03 | 2.91E-03 | 3.86E-03 | 1.81E-03 | 1.22E+01 | 1.43 | 9.45E+03 | 3.18E+04 | 1.28E+04 | 9.68E+03 | 2.06E+04 | 3.47E-07 |
| Uranium (92) | U-231 | 2.07E-01 | 6.64E-02 | 1.64E-01 | 2.07E-01 | 7.47E-02 | 6.02E+01 | 1.39 | 9.15E+02 | 2.85E+03 | 1.16E+03 | 9.15E+02 | 2.54E+03 | 6.81E-09 |
| Uranium (92) | U-232 | 7.91E-04 | 3.02E-04 | 6.30E-04 | 7.81E-04 | 9.42E-04 | 9.63E-03 | 1.43 | 3.89E+03 | 1.02E+04 | 4.88E+03 | 3.93E+03 | 3.26E+03 | 1.82E-04 |
| Uranium (92) | U-233 | 1.26E-03 | 3.64E-04 | 8.97E-04 | 1.22E-03 | 6.99E-04 | 4.37E-06 | 1.43 | 2.43E+03 | 8.42E+03 | 3.41E+03 | 2.51E+03 | 4.38E+03 | 2.51E-01 |
| Uranium (92) | U-234 | 3.43E-04 | 1.56E-04 | 2.89E-04 | 3.43E-04 | 6.84E-04 | 2.83E-06 | 1.43 | 8.91E+03 | 1.96E+04 | 1.06E+04 | 8.91E+03 | 4.47E+03 | 1.43E+00 |
| Uranium (92) | U-235 | 6.58E-01 | 1.65E-01 | 4.57E-01 | 6.42E-01 | 1.63E-01 | 9.85E-10 | 1.3 | 5.11E+00 | 2.04E+01 | 7.37E+00 | 5.25E+00 | 2.06E+01 | 2.37E+00 |
| Uranium (92) | U-235+D | 6.90E-01 | 1.77E-01 | 4.83E-01 | 6.73E-01 | 1.82E-01 | 9.85E-10 | 1.03 | 6.17E+00 | 2.41E+01 | 8.81E+00 | 6.32E+00 | 2.34E+01 | 2.86E+00 |
| Uranium (92) | U-235+E | 6.90E-01 | 1.77E-01 | 4.83E-01 | 6.73E-01 | 1.82E-01 | 9.85E-10 | | | | | | | |
| Uranium (92) | U-236 | 1.77E-04 | 9.72E-05 | 1.56E-04 | 1.77E-04 | 5.87E-04 | 2.96E-08 | 1.43 | 1.72E+04 | 3.15E+04 | 1.96E+04 | 1.73E+04 | 5.21E+03 | 2.67E+02 |
| Uranium (92) | U-237 | 4.81E-01 | 1.36E-01 | 3.51E-01 | 4.70E-01 | 1.44E-01 | 3.75E+01 | 1.34 | 2.54E+02 | 8.98E+02 | 3.49E+02 | 2.60E+02 | 8.53E+02 | 3.12E-09 |
| Uranium (92) | U-238 | 7.94E-05 | 6.29E-05 | 7.83E-05 | 7.94E-05 | 4.94E-04 | 1.55E-10 | 1.43 | 3.84E+04 | 4.86E+04 | 3.90E+04 | 3.84E+04 | 6.19E+03 | 1.14E+05 |
| Uranium (92) | U-238+D | 1.56E-01 | | | | | 1.55E-10 | 1.23 | 2.29E+01 | | | | | 6.81E+01 |
| Uranium (92) | U-238+E | 1.55E-01 | 4.59E-02 | 9.96E-02 | 1.40E-01 | 1.41E-01 | 1.55E-10 | | | | | | | |
| Uranium (92) | U-239 | 1.58E-01 | 5.17E-02 | 1.19E-01 | 1.51E-01 | 9.63E-02 | 1.55E+04 | 1.32 | 3.26E+05 | 9.98E+05 | 4.34E+05 | 3.42E+05 | 5.35E+05 | 9.78E-09 |
| Uranium (92) | U-240 | 1.11E-03 | 8.06E-04 | 1.08E-03 | 1.11E-03 | 3.72E-03 | 4.31E+02 | 1.41 | 1.21E+06 | 1.66E+06 | 1.24E+06 | 1.21E+06 | 3.59E+05 | 1.31E-06 |
| Vanadium (23) | V-47 | 5.50E+00 | 1.14E+00 | 3.25E+00 | 4.98E+00 | 1.23E+00 | 1.12E+04 | 1.2 | 7.41E+03 | 3.57E+04 | 1.26E+04 | 8.19E+03 | 3.33E+04 | 6.05E-11 |
| Vanadium (23) | V-48 | 1.74E+01 | 3.23E+00 | 9.31E+00 | 1.49E+01 | 3.17E+00 | 1.56E+01 | 1.17 | 3.36E+00 | 1.81E+01 | 6.29E+00 | 3.94E+00 | 1.84E+01 | 2.01E-11 |
| Vanadium (23) | V-49 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.67E-01 | 0 | | | | | | |
| Tungsten (74) | W-176 | 4.18E-01 | 1.59E-01 | 3.52E-01 | 4.18E-01 | 1.80E-01 | 2.64E+03 | 1.27 | 2.17E+04 | 5.71E+04 | 2.57E+04 | 2.17E+04 | 5.05E+04 | 2.81E-09 |
| Tungsten (74) | W-177 | 4.55E+00 | 9.72E-01 | 2.69E+00 | 4.07E+00 | 9.78E-01 | 2.70E+03 | 1.2 | 2.17E+03 | 1.02E+04 | 3.67E+03 | 2.43E+03 | 1.01E+04 | 2.76E-10 |
| Tungsten (74) | W-178 | 2.13E-02 | 1.05E-02 | 1.98E-02 | 2.13E-02 | 1.33E-02 | 1.17E+01 | 1.35 | 1.78E+03 | 3.62E+03 | 1.92E+03 | 1.78E+03 | 2.85E+03 | 5.28E-08 |
| Tungsten (74) | W-178+D | 4.37E-01 | | | | | 1.17E+01 | 1.19 | 9.82E+01 | | | | | 2.91E-09 |
| Tungsten (74) | W-178+E | 4.37E-01 | | | | | 1.17E+01 | | | | | | | |
| Tungsten (74) | W-179 | 8.09E-02 | 4.14E-02 | 7.57E-02 | 8.09E-02 | 5.81E-02 | 9.71E+03 | 1.3 | 4.05E+05 | 7.92E+05 | 4.33E+05 | 4.05E+05 | 5.64E+05 | 1.45E-08 |
| Tungsten (74) | W-181 | 6.49E-02 | 3.17E-02 | 6.04E-02 | 6.49E-02 | 4.01E-02 | 2.09E+00 | 1.29 | 1.25E+02 | 2.55E+02 | 1.34E+02 | 1.25E+02 | 2.02E+02 | 2.10E-08 |
| Tungsten (74) | W-185 | 3.82E-04 | 1.40E-04 | 3.10E-04 | 3.79E-04 | 2.00E-04 | 3.37E+00 | 1.33 | 3.00E+04 | 8.21E+04 | 3.71E+04 | 3.03E+04 | 5.76E+04 | 3.20E-06 |
| Tungsten (74) | W-187 | 2.57E+00 | 5.33E-01 | 1.50E+00 | 2.31E+00 | 5.46E-01 | 2.54E+02 | 1.23 | 3.53E+02 | 1.70E+03 | 6.05E+02 | 3.93E+02 | 1.66E+03 | 5.04E-10 |
| Tungsten (74) | W-188 | 8.90E-03 | 2.11E-03 | 5.84E-03 | 8.47E-03 | 2.12E-03 | 3.64E+00 | 1.26 | 1.47E+03 | 6.20E+03 | 2.24E+03 | 1.54E+03 | 6.15E+03 | 1.47E-07 |
| Xenon (54) | Xe-120 | 2.13E+00 | 4.49E-01 | 1.25E+00 | 1.92E+00 | 4.68E-01 | 9.11E+03 | 1.23 | 1.53E+04 | 7.22E+04 | 2.59E+04 | 1.69E+04 | 6.93E+04 | 3.90E-10 |
| Xenon (54) | Xe-121 | 1.09E+01 | 1.98E+00 | 5.67E+00 | 9.10E+00 | 1.97E+00 | 9.08E+03 | 1.18 | 3.10E+03 | 1.71E+04 | 5.95E+03 | 3.71E+03 | 1.71E+04 | 8.01E-11 |

| | | Toxicity and Isotope-specific Information | | | | | | | Dose Compliance Concentrations for Radionuclides in Outdoor Surfaces (SDCCs) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Element (Atomic No.)** | **Radionuclide** | **Soil Volume External Exposure DCF (Infinite Volume) (mrem/yr per pCi/g)** | **Soil Volume External Exposure DCF (1 cm) (mrem/yr per pCi/g)** | **Soil Volume External Exposure DCF (5 cm) (mrem/yr per pCi/g)** | **External Exposure DCF (15 cm) (mrem/yr per pCi/g)** | **External Exposure DCF (Ground Plane) (mrem/yr per pCi/cm$^2$)** | **Lambda** | **$F_{surf}$** | **Soil Volume Soil Volume SDCC (pCi/g)** | **Soil Volume 1cm SDCC (pCi/g)** | **Soil Volume 5cm SDCC (pCi/g)** | **Soil Volume 15cm SDCC (pCi/g)** | **Ground Plane SDCC (pCi/cm$^2$)** | **Soil Volume SDCC (mg/kg)** |
| Actinium (89) | Ac-223 | 1.98E-02 | 4.81E-03 | 1.31E-02 | 1.87E-02 | 5.16E-03 | 1.66E+05 | 1.46 | 2.51E+07 | 1.03E+08 | 3.79E+07 | 2.66E+07 | 9.61E+07 | 6.55E-08 |
| Xenon (54) | Xe-122 | 2.33E-01 | 5.71E-02 | 1.50E-01 | 2.20E-01 | 7.04E-02 | 3.02E+02 | 1.28 | 4.45E+03 | 1.82E+04 | 6.91E+03 | 4.71E+03 | 1.47E+04 | 3.49E-09 |
| Xenon (54) | Xe-123 | 3.41E+00 | 6.84E-01 | 1.94E+00 | 3.00E+00 | 7.04E-01 | 2.92E+03 | 1.2 | 3.12E+03 | 1.56E+04 | 5.50E+03 | 3.55E+03 | 1.52E+04 | 2.55E-10 |
| Xenon (54) | Xe-125 | 1.19E+00 | 2.74E-01 | 7.59E-01 | 1.12E+00 | 2.88E-01 | 3.57E+02 | 1.25 | 1.06E+03 | 4.58E+03 | 1.65E+03 | 1.12E+03 | 4.35E+03 | 7.18E-10 |
| Xenon (54) | Xe-127 | 1.21E+00 | 2.89E-01 | 7.98E-01 | 1.16E+00 | 2.99E-01 | 6.95E+00 | 1.25 | 2.01E+01 | 8.42E+01 | 3.05E+01 | 2.11E+01 | 8.15E+01 | 7.15E-10 |
| Xenon (54) | Xe-129m | 5.69E-02 | 2.35E-02 | 4.35E-02 | 5.56E-02 | 4.85E-02 | 3.16E+01 | 1.29 | 1.88E+03 | 4.55E+03 | 2.46E+03 | 1.93E+03 | 2.20E+03 | 1.49E-08 |
| Xenon (54) | Xe-131m | 1.92E-02 | 8.58E-03 | 1.52E-02 | 1.88E-02 | 1.87E-02 | 2.13E+01 | 1.3 | 3.74E+03 | 8.37E+03 | 4.74E+03 | 3.81E+03 | 3.85E+03 | 4.47E-08 |
| Xenon (54) | Xe-133 | 8.71E-02 | 3.49E-02 | 7.46E-02 | 8.73E-02 | 4.61E-02 | 4.82E+01 | 1.28 | 1.89E+03 | 4.72E+03 | 2.21E+03 | 1.89E+03 | 3.57E+03 | 1.01E-08 |
| Xenon (54) | Xe-133m | 1.18E-01 | 3.13E-02 | 7.94E-02 | 1.14E-01 | 4.12E-02 | 1.16E+02 | 1.28 | 3.34E+03 | 1.26E+04 | 4.98E+03 | 3.48E+03 | 9.60E+03 | 7.46E-09 |
| Xenon (54) | Xe-135 | 1.23E+00 | 2.78E-01 | 7.89E-01 | 1.16E+00 | 2.92E-01 | 6.68E+02 | 1.23 | 1.95E+03 | 8.59E+03 | 3.03E+03 | 2.05E+03 | 8.18E+03 | 7.63E-10 |
| Xenon (54) | Xe-135m | 2.35E+00 | 4.83E-01 | 1.37E+00 | 2.13E+00 | 4.89E-01 | 2.38E+04 | 1.2 | 3.69E+04 | 1.80E+05 | 6.32E+04 | 4.08E+04 | 1.78E+05 | 4.06E-10 |
| Xenon (54) | Xe-138 | 6.99E+00 | 1.23E+00 | 3.54E+00 | 5.76E+00 | 1.25E+00 | 2.57E+04 | 1.15 | 1.40E+04 | 7.99E+04 | 2.76E+04 | 1.70E+04 | 7.84E+04 | 1.46E-10 |
| Yttrium (39) | Y-86 | 2.14E+01 | 3.95E+00 | 1.14E+01 | 1.83E+01 | 3.89E+00 | 4.12E+02 | 1.17 | 7.18E+01 | 3.90E+02 | 1.35E+02 | 8.41E+01 | 3.96E+02 | 2.91E-11 |
| Yttrium (39) | Y-86m | 1.06E+00 | 2.44E-01 | 6.88E-01 | 1.00E+00 | 2.38E-01 | 7.59E+03 | 1.23 | 2.55E+04 | 1.10E+05 | 3.92E+04 | 2.69E+04 | 1.13E+05 | 5.62E-10 |
| Yttrium (39) | Y-87 | 2.44E+00 | 5.09E-01 | 1.45E+00 | 2.22E+00 | 5.03E-01 | 7.56E+01 | 1.26 | 1.08E+02 | 5.17E+02 | 1.82E+02 | 1.19E+02 | 5.23E+02 | 2.41E-10 |
| Yttrium (39) | Y-88 | 1.69E+01 | 2.91E+00 | 8.45E+00 | 1.38E+01 | 2.81E+00 | 2.37E+00 | 1.16 | 5.85E-01 | 3.40E+00 | 1.17E+00 | 7.14E-01 | 3.51E+00 | 4.21E-11 |
| Yttrium (39) | Y-90 | 4.01E-02 | 2.35E-02 | 3.25E-02 | 3.88E-02 | 1.28E-01 | 9.49E+01 | 1.41 | 7.35E+03 | 1.25E+04 | 9.08E+03 | 7.60E+03 | 2.30E+03 | 1.35E-08 |
| Yttrium (39) | Y-90m | 3.26E+00 | 7.05E-01 | 2.00E+00 | 3.02E+00 | 6.97E-01 | 1.90E+03 | 1.22 | 2.10E+03 | 9.72E+03 | 3.43E+03 | 2.27E+03 | 9.84E+03 | 1.93E-10 |
| Yttrium (39) | Y-91 | 3.79E-02 | 1.36E-02 | 2.46E-02 | 3.39E-02 | 8.71E-02 | 4.32E+00 | 1.16 | 4.38E+02 | 1.22E+03 | 6.74E+02 | 4.89E+02 | 1.91E+02 | 1.79E-08 |
| Yttrium (39) | Y-91m | 2.95E+00 | 6.01E-01 | 1.71E+00 | 2.65E+00 | 5.95E-01 | 7.33E+03 | 1.2 | 9.08E+03 | 4.46E+04 | 1.56E+04 | 1.01E+04 | 4.50E+04 | 2.19E-10 |
| Yttrium (39) | Y-92 | 1.60E+00 | 3.30E-01 | 8.78E-01 | 1.38E+00 | 4.47E-01 | 1.71E+03 | 1.17 | 4.03E+03 | 1.95E+04 | 7.33E+03 | 4.68E+03 | 1.44E+04 | 4.19E-10 |
| Yttrium (39) | Y-93 | 5.97E-01 | 1.33E-01 | 3.32E-01 | 5.11E-01 | 2.45E-01 | 6.01E+02 | 1.16 | 3.80E+03 | 1.71E+04 | 6.82E+03 | 4.43E+03 | 9.24E+03 | 1.14E-09 |
| Yttrium (39) | Y-94 | 6.81E+00 | 1.29E+00 | 3.64E+00 | 5.80E+00 | 1.39E+00 | 1.91E+04 | 1.16 | 1.06E+04 | 5.57E+04 | 1.97E+04 | 1.24E+04 | 5.17E+04 | 1.01E-10 |
| Yttrium (39) | Y-95 | 5.97E+00 | 9.94E-01 | 2.83E+00 | 4.70E+00 | 1.06E+00 | 3.40E+04 | 1.12 | 2.22E+04 | 1.33E+05 | 4.68E+04 | 2.82E+04 | 1.25E+05 | 1.20E-10 |
| Ytterbium (70) | Yb-162 | 4.20E-01 | 1.29E-01 | 3.15E-01 | 4.12E-01 | 1.42E-01 | 1.93E+04 | 1.25 | 1.61E+05 | 5.22E+05 | 2.14E+05 | 1.64E+05 | 4.74E+05 | 2.62E-09 |
| Ytterbium (70) | Yb-166 | 1.27E-01 | 6.47E-02 | 1.18E-01 | 1.27E-01 | 8.68E-02 | 1.07E+02 | 1.27 | 2.91E+03 | 5.73E+03 | 3.13E+03 | 2.91E+03 | 4.27E+03 | 8.77E-09 |
| Ytterbium (70) | Yb-167 | 7.98E-01 | 2.48E-01 | 5.93E-01 | 7.74E-01 | 2.77E-01 | 2.08E+04 | 1.25 | 9.16E+04 | 2.95E+05 | 1.23E+05 | 9.45E+04 | 2.64E+05 | 1.43E-09 |
| Ytterbium (70) | Yb-169 | 9.96E-01 | 2.95E-01 | 7.25E-01 | 9.70E-01 | 3.24E-01 | 7.90E+00 | 1.25 | 2.79E+01 | 9.42E+01 | 3.83E+01 | 2.86E+01 | 8.56E+01 | 1.16E-09 |
| Ytterbium (70) | Yb-175 | 1.94E-01 | 4.38E-02 | 1.23E-01 | 1.82E-01 | 4.36E-02 | 6.04E+01 | 1.22 | 1.12E+03 | 4.95E+03 | 1.77E+03 | 1.19E+03 | 4.97E+03 | 6.29E-09 |
| Ytterbium (70) | Yb-177 | 1.04E+00 | 2.09E-01 | 5.86E-01 | 9.10E-01 | 2.53E-01 | 3.20E+03 | 1.18 | 1.14E+04 | 5.69E+04 | 2.03E+04 | 1.31E+04 | 4.70E+04 | 1.22E-09 |
| Ytterbium (70) | Yb-178 | 1.82E-01 | 3.95E-02 | 1.12E-01 | 1.69E-01 | 4.20E-02 | 4.92E+03 | 1.22 | 9.75E+04 | 4.48E+05 | 1.58E+05 | 1.05E+05 | 4.22E+05 | 6.84E-09 |
| Zinc (30) | Zn-62 | 2.35E+00 | 4.87E-01 | 1.38E+00 | 2.13E+00 | 4.84E-01 | 6.56E+02 | 1.2 | 1.02E+03 | 4.91E+03 | 1.73E+03 | 1.12E+03 | 4.94E+03 | 1.87E-10 |
| Zinc (30) | Zn-63 | 6.14E+00 | 1.27E+00 | 3.58E+00 | 5.52E+00 | 1.35E+00 | 9.56E+03 | 1.2 | 5.71E+03 | 2.76E+04 | 9.78E+03 | 6.34E+03 | 2.59E+04 | 7.30E-11 |
| Zinc (30) | Zn-65 | 3.51E+00 | 6.43E-01 | 1.86E+00 | 2.97E+00 | 6.31E-01 | 1.04E+00 | 1.16 | 1.73E+00 | 9.41E+00 | 3.26E+00 | 2.04E+00 | 9.59E+00 | 2.10E-10 |
| Zinc (30) | Zn-69 | 2.93E-03 | 1.51E-03 | 2.39E-03 | 2.87E-03 | 2.43E-02 | 6.39E+03 | 1.2 | 7.96E+06 | 1.55E+07 | 9.76E+06 | 8.11E+06 | 9.60E+05 | 1.67E-07 |
| Zinc (30) | Zn-69m | 2.24E+00 | 4.72E-01 | 1.34E+00 | 2.05E+00 | 4.64E-01 | 4.41E+02 | 1.21 | 7.16E+02 | 3.40E+03 | 1.19E+03 | 7.81E+02 | 3.45E+03 | 2.17E-10 |
| Zinc (30) | Zn-71m | 8.60E+00 | 1.76E+00 | 5.02E+00 | 7.74E+00 | 1.80E+00 | 1.55E+03 | 1.2 | 6.60E+02 | 3.22E+03 | 1.13E+03 | 7.33E+02 | 3.16E+03 | 5.87E-11 |
| Zinc (30) | Zn-72 | 5.97E-01 | 1.58E-01 | 4.27E-01 | 5.86E-01 | 1.56E-01 | 1.31E+02 | 1.29 | 7.45E+02 | 2.82E+03 | 1.04E+03 | 7.59E+02 | 2.84E+03 | 7.97E-10 |
| Zirconium (40) | Zr-86 | 1.32E+00 | 2.98E-01 | 8.43E-01 | 1.25E+00 | 2.99E-01 | 3.68E+02 | 1.33 | 9.22E+02 | 4.07E+03 | 1.44E+03 | 9.75E+02 | 4.06E+03 | 4.18E-10 |
| Zirconium (40) | Zr-88 | 2.09E+00 | 4.46E-01 | 1.27E+00 | 1.92E+00 | 4.40E-01 | 3.03E+00 | 1.27 | 5.27E+00 | 2.47E+01 | 8.67E+00 | 5.73E+00 | 2.50E+01 | 2.96E-10 |
| Zirconium (40) | Zr-89 | 6.73E+00 | 1.30E+00 | 3.73E+00 | 5.87E+00 | 1.28E+00 | 7.74E+01 | 1.2 | 4.20E+01 | 2.18E+02 | 7.59E+01 | 4.82E+01 | 2.20E+02 | 9.38E-11 |
| Zirconium (40) | Zr-93 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 4.53E-07 | 0 | | | | | | |
| Zirconium (40) | Zr-95 | 4.23E+00 | 8.32E-01 | 2.39E+00 | 3.75E+00 | 8.22E-01 | 3.95E+00 | 1.18 | 3.53E+00 | 1.79E+01 | 6.25E+00 | 3.98E+00 | 1.82E+01 | 1.64E-10 |
| Zirconium (40) | Zr-97 | 1.08E+00 | 2.13E-01 | 5.91E-01 | 9.33E-01 | 2.92E-01 | 3.59E+02 | 1.17 | 1.24E+03 | 6.32E+03 | 2.27E+03 | 1.44E+03 | 4.61E+03 | 6.50E-10 |