Table 4-42 (Page 1 of 4)

Child Meat $R_i$

$m^2$*mrem*sec/yr*µCi

| Nuclide | Bone | Liver | T Body | Thyroid | Kidney | Lung | GI-LLI | Skin |
|---|---|---|---|---|---|---|---|---|
| H-3 | 0.00E+00 | 1.34E+02 | 1.34E+02 | 1.34E+02 | 1.34E+02 | 1.34E+02 | 1.34E+02 | 0.00E+00 |
| C-14 | 5.29E+05 | 1.06E+05 | 1.06E+05 | 1.06E+05 | 1.06E+05 | 1.06E+05 | 1.06E+05 | 0.00E+00 |
| NA-22 | 1.75E+09 | 1.75E+09 | 1.75E+09 | 1.75E+09 | 1.75E+09 | 1.75E+09 | 1.75E+09 | 0.00E+00 |
| NA-24 | 1.72E-03 | 1.72E-03 | 1.72E-03 | 1.72E-03 | 1.72E-03 | 1.72E-03 | 1.72E-03 | 0.00E+00 |
| P-32 | 7.42E+09 | 3.47E+08 | 2.86E+08 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.05E+08 | 0.00E+00 |
| CA-41 | 1.42E+09 | 0.00E+00 | 1.55E+08 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.77E+05 | 0.00E+00 |
| SC-46 | 2.34E+05 | 3.21E+05 | 1.24E+05 | 0.00E+00 | 2.84E+05 | 0.00E+00 | 4.69E+08 | 0.00E+00 |
| CR-51 | 0.00E+00 | 0.00E+00 | 8.79E+03 | 4.88E+03 | 1.33E+03 | 8.91E+03 | 4.66E+05 | 0.00E+00 |
| MN-54 | 0.00E+00 | 8.01E+06 | 2.13E+06 | 0.00E+00 | 2.25E+06 | 0.00E+00 | 6.72E+06 | 0.00E+00 |
| FE-55 | 4.57E+08 | 2.42E+08 | 7.51E+07 | 0.00E+00 | 0.00E+00 | 1.37E+08 | 4.49E+07 | 0.00E+00 |
| MN-56 | 0.00E+00 | 1.64E-53 | 3.70E-54 | 0.00E+00 | 1.98E-53 | 0.00E+00 | 2.38E-51 | 0.00E+00 |
| CO-57 | 0.00E+00 | 5.92E+06 | 1.20E+07 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 4.85E+07 | 0.00E+00 |
| CO-58 | 0.00E+00 | 1.64E+07 | 5.02E+07 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 9.58E+07 | 0.00E+00 |
| FE-59 | 3.76E+08 | 6.09E+08 | 3.03E+08 | 0.00E+00 | 0.00E+00 | 1.77E+08 | 6.34E+08 | 0.00E+00 |
| CO-60 | 0.00E+00 | 6.93E+07 | 2.04E+08 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.84E+08 | 0.00E+00 |
| NI-59 | 2.18E+08 | 5.80E+07 | 3.69E+07 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.85E+06 | 0.00E+00 |
| NI-63 | 2.91E+09 | 1.56E+08 | 9.91E+07 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.05E+07 | 0.00E+00 |
| CU-64 | 0.00E+00 | 2.97E-07 | 1.80E-07 | 0.00E+00 | 7.19E-07 | 0.00E+00 | 1.40E-05 | 0.00E+00 |
| NI-65 | 3.52E-53 | 3.31E-54 | 1.93E-54 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 4.06E-52 | 0.00E+00 |
| ZN-65 | 3.75E+08 | 1.00E+09 | 6.22E+08 | 0.00E+00 | 6.30E+08 | 0.00E+00 | 1.76E+08 | 0.00E+00 |
| ZN-69m | 2.61E-05 | 4.45E-05 | 5.25E-06 | 0.00E+00 | 2.58E-05 | 0.00E+00 | 1.45E-03 | 0.00E+00 |
| ZN-69 | 2.87E-153 | 4.15E-153 | 3.83E-154 | 0.00E+00 | 2.52E-153 | 0.00E+00 | 2.61E-151 | 0.00E+00 |
| SE-79 | 0.00E+00 | 1.29E+08 | 2.87E+07 | 0.00E+00 | 2.10E+08 | 0.00E+00 | 8.48E+06 | 0.00E+00 |
| BR-82 | 0.00E+00 | 0.00E+00 | 1.52E+03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| BR-83 | 0.00E+00 | 0.00E+00 | 9.52E-57 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| BR-84 | 0.00E+00 | 0.00E+00 | 9.37E-270 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| BR-85 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RB-86 | 0.00E+00 | 5.77E+08 | 3.55E+08 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.71E+07 | 0.00E+00 |
| RB-87 | 0.00E+00 | 1.25E+09 | 5.80E+08 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.88E+07 | 0.00E+00 |
| RB-88 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RB-89 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| SR-89 | 4.82E+08 | 0.00E+00 | 1.38E+07 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.87E+07 | 0.00E+00 |
| SR-90 | 1.57E+10 | 0.00E+00 | 3.15E+08 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.40E+08 | 0.00E+00 |
| Y-90 | 1.71E+02 | 0.00E+00 | 4.59E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 4.88E+05 | 0.00E+00 |
| SR-91 | 2.40E-10 | 0.00E+00 | 9.05E-12 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.29E-10 | 0.00E+00 |
| Y-91m | 1.09E-174 | 0.00E+00 | 3.98E-176 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.14E-171 | 0.00E+00 |
| Y-91 | 1.80E+06 | 0.00E+00 | 4.82E+04 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.40E+08 | 0.00E+00 |

Table 4-42 (Page 2 of 4)

Child Meat $R_i$

$m^2$*mrem*sec/yr*µCi

| Nuclide | Bone | Liver | T Body | Thyroid | Kidney | Lung | GI-LLI | Skin |
|---|---|---|---|---|---|---|---|---|
| SR-92 | 1.84E-49 | 0.00E+00 | 7.39E-51 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.49E-48 | 0.00E+00 |
| Y-92 | 2.41E-39 | 0.00E+00 | 6.89E-41 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.96E-35 | 0.00E+00 |
| Y-93 | 7.44E-12 | 0.00E+00 | 2.04E-13 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.11E-07 | 0.00E+00 |
| NB-93m | 2.99E+07 | 7.46E+06 | 2.45E+06 | 0.00E+00 | 8.06E+06 | 0.00E+00 | 1.12E+09 | 0.00E+00 |
| NB-95 | 3.10E+06 | 1.21E+06 | 8.62E+05 | 0.00E+00 | 1.13E+06 | 0.00E+00 | 2.23E+09 | 0.00E+00 |
| NB-97 | 9.14E-119 | 1.65E-119 | 7.71E-120 | 0.00E+00 | 1.83E-119 | 0.00E+00 | 5.10E-114 | 0.00E+00 |
| ZR-93 | 5.80E+06 | 2.17E+06 | 1.55E+06 | 0.00E+00 | 8.41E+06 | 0.00E+00 | 8.24E+08 | 0.00E+00 |
| ZR-95 | 2.66E+06 | 5.85E+05 | 5.21E+05 | 0.00E+00 | 8.38E+05 | 0.00E+00 | 6.11E+08 | 0.00E+00 |
| ZR-97 | 3.21E-05 | 4.63E-06 | 2.73E-06 | 0.00E+00 | 6.65E-06 | 0.00E+00 | 7.02E-01 | 0.00E+00 |
| MO-93 | 0.00E+00 | 1.97E+08 | 7.07E+06 | 0.00E+00 | 5.19E+07 | 0.00E+00 | 9.98E+06 | 0.00E+00 |
| MO-99 | 0.00E+00 | 1.15E+05 | 2.84E+04 | 0.00E+00 | 2.46E+05 | 0.00E+00 | 9.51E+04 | 0.00E+00 |
| TC-99 | 2.19E+08 | 2.44E+08 | 8.75E+07 | 0.00E+00 | 2.87E+09 | 2.15E+07 | 2.56E+09 | 0.00E+00 |
| TC-99m | 6.20E-21 | 1.22E-20 | 2.01E-19 | 0.00E+00 | 1.77E-19 | 6.17E-21 | 6.91E-18 | 0.00E+00 |
| TC-101 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RU-103 | 1.55E+08 | 0.00E+00 | 5.96E+07 | 0.00E+00 | 3.90E+08 | 0.00E+00 | 4.01E+09 | 0.00E+00 |
| RU-105 | 9.02E-28 | 0.00E+00 | 3.27E-28 | 0.00E+00 | 7.93E-27 | 0.00E+00 | 5.88E-25 | 0.00E+00 |
| RU-106 | 4.44E+09 | 0.00E+00 | 5.54E+08 | 0.00E+00 | 5.99E+09 | 0.00E+00 | 6.90E+10 | 0.00E+00 |
| RH-105 | 6.08E+00 | 3.27E+00 | 2.79E+00 | 0.00E+00 | 1.30E+01 | 0.00E+00 | 2.02E+02 | 0.00E+00 |
| PD-107 | 0.00E+00 | 1.93E+06 | 1.64E+05 | 0.00E+00 | 1.62E+07 | 0.00E+00 | 3.83E+06 | 0.00E+00 |
| PD-109 | 0.00E+00 | 1.58E-06 | 4.72E-07 | 0.00E+00 | 8.45E-06 | 0.00E+00 | 9.31E-05 | 0.00E+00 |
| AG-110m | 8.39E+06 | 5.67E+06 | 4.53E+06 | 0.00E+00 | 1.06E+07 | 0.00E+00 | 6.74E+08 | 0.00E+00 |
| AG-111 | 2.33E+05 | 7.29E+04 | 4.81E+04 | 0.00E+00 | 2.20E+05 | 0.00E+00 | 4.46E+07 | 0.00E+00 |
| CD-113m | 0.00E+00 | 5.50E+06 | 2.34E+05 | 0.00E+00 | 5.66E+06 | 0.00E+00 | 1.42E+07 | 0.00E+00 |
| CD-115m | 0.00E+00 | 1.78E+06 | 7.58E+04 | 0.00E+00 | 1.32E+06 | 0.00E+00 | 2.42E+07 | 0.00E+00 |
| SN-123 | 8.81E+09 | 1.09E+08 | 2.15E+08 | 1.16E+08 | 0.00E+00 | 0.00E+00 | 4.32E+09 | 0.00E+00 |
| SN-125 | 2.81E+08 | 4.23E+06 | 1.26E+07 | 4.39E+06 | 0.00E+00 | 0.00E+00 | 8.69E+08 | 0.00E+00 |
| SN-126 | 2.72E+10 | 3.39E+08 | 7.74E+08 | 9.32E+07 | 0.00E+00 | 0.00E+00 | 2.04E+09 | 0.00E+00 |
| SB-124 | 2.92E+07 | 3.79E+05 | 1.02E+07 | 6.45E+04 | 0.00E+00 | 1.62E+07 | 1.83E+08 | 0.00E+00 |
| SB-125 | 2.85E+07 | 2.20E+05 | 5.97E+06 | 2.64E+04 | 0.00E+00 | 1.59E+07 | 6.80E+07 | 0.00E+00 |
| SB-126 | 2.76E+06 | 4.22E+04 | 9.91E+05 | 1.62E+04 | 0.00E+00 | 1.32E+06 | 5.56E+07 | 0.00E+00 |
| SB-127 | 2.54E+04 | 3.93E+02 | 8.82E+03 | 2.83E+02 | 0.00E+00 | 1.10E+04 | 1.43E+06 | 0.00E+00 |
| TE-125m | 5.69E+08 | 1.54E+08 | 7.59E+07 | 1.60E+08 | 0.00E+00 | 0.00E+00 | 5.49E+08 | 0.00E+00 |
| TE-127m | 1.77E+09 | 4.78E+08 | 2.11E+08 | 4.24E+08 | 5.06E+09 | 0.00E+00 | 1.44E+09 | 0.00E+00 |
| TE-127 | 3.39E-10 | 9.13E-11 | 7.26E-11 | 2.34E-10 | 9.63E-10 | 0.00E+00 | 1.32E-08 | 0.00E+00 |
| TE-129m | 1.79E+09 | 5.00E+08 | 2.78E+08 | 5.77E+08 | 5.26E+09 | 0.00E+00 | 2.18E+09 | 0.00E+00 |
| TE-129 | 7.10E-121 | 1.98E-121 | 1.69E-121 | 5.07E-121 | 2.08E-120 | 0.00E+00 | 4.42E-119 | 0.00E+00 |
| TE-133m | 8.56E-153 | 3.46E-153 | 4.29E-153 | 6.64E-153 | 3.29E-152 | 0.00E+00 | 2.64E-151 | 0.00E+00 |

Table 4-42 (Page 3 of 4)

Child Meat $R_i$

$m^2$*mrem*sec/yr*µCi

| Nuclide | Bone | Liver | T Body | Thyroid | Kidney | Lung | GI-LLI | Skin |
|---|---|---|---|---|---|---|---|---|
| TE-134 | 4.72E-204 | 2.12E-204 | 2.83E-204 | 3.73E-204 | 1.97E-203 | 0.00E+00 | 2.16E-203 | 0.00E+00 |
| I-129 | 2.06E+08 | 1.26E+08 | 1.13E+08 | 8.27E+10 | 2.13E+08 | 0.00E+00 | 6.36E+06 | 0.00E+00 |
| I-130 | 3.04E-06 | 6.13E-06 | 3.16E-06 | 6.76E-04 | 9.17E-06 | 0.00E+00 | 2.87E-06 | 0.00E+00 |
| I-131 | 1.65E+07 | 1.66E+07 | 9.46E+06 | 5.50E+09 | 2.73E+07 | 0.00E+00 | 1.48E+06 | 0.00E+00 |
| TE-131m | 7.00E+02 | 2.42E+02 | 2.58E+02 | 4.98E+02 | 2.34E+03 | 0.00E+00 | 9.82E+03 | 0.00E+00 |
| TE-131 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| I-132 | 1.02E-58 | 1.88E-58 | 8.65E-59 | 8.72E-57 | 2.88E-58 | 0.00E+00 | 2.21E-58 | 0.00E+00 |
| TE-132 | 2.12E+06 | 9.38E+05 | 1.13E+06 | 1.37E+06 | 8.71E+06 | 0.00E+00 | 9.45E+06 | 0.00E+00 |
| I-133 | 5.67E-01 | 7.02E-01 | 2.66E-01 | 1.30E+02 | 1.17E+00 | 0.00E+00 | 2.83E-01 | 0.00E+00 |
| CS-134m | 3.86E-47 | 5.72E-47 | 3.73E-47 | 0.00E+00 | 3.02E-47 | 4.99E-48 | 7.23E-47 | 0.00E+00 |
| CS-134 | 9.22E+08 | 1.51E+09 | 3.19E+08 | 0.00E+00 | 4.69E+08 | 1.68E+08 | 8.16E+06 | 0.00E+00 |
| I-134 | 1.57E-161 | 2.91E-161 | 1.34E-161 | 6.70E-160 | 4.45E-161 | 0.00E+00 | 1.93E-161 | 0.00E+00 |
| I-135 | 6.52E-17 | 1.17E-16 | 5.55E-17 | 1.04E-14 | 1.80E-16 | 0.00E+00 | 8.94E-17 | 0.00E+00 |
| CS-135 | 3.39E+08 | 2.36E+08 | 2.42E+07 | 0.00E+00 | 8.34E+07 | 2.78E+07 | 1.77E+06 | 0.00E+00 |
| CS-136 | 1.62E+07 | 4.46E+07 | 2.88E+07 | 0.00E+00 | 2.37E+07 | 3.54E+06 | 1.57E+06 | 0.00E+00 |
| CS-137 | 1.33E+09 | 1.28E+09 | 1.88E+08 | 0.00E+00 | 4.16E+08 | 1.50E+08 | 7.99E+06 | 0.00E+00 |
| CS-138 | 4.13E-267 | 5.75E-267 | 3.64E-267 | 0.00E+00 | 4.04E-267 | 4.35E-268 | 2.65E-267 | 0.00E+00 |
| CS-139 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| BA-139 | 1.98E-101 | 1.06E-104 | 5.73E-103 | 0.00E+00 | 9.22E-105 | 6.21E-105 | 1.14E-99 | 0.00E+00 |
| BA-140 | 4.38E+07 | 3.84E+04 | 2.56E+06 | 0.00E+00 | 1.25E+04 | 2.29E+04 | 2.22E+07 | 0.00E+00 |
| LA-140 | 5.59E-02 | 1.95E-02 | 6.58E-03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.44E+02 | 0.00E+00 |
| BA-141 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| LA-141 | 6.19E-37 | 1.44E-37 | 3.13E-38 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.21E-32 | 0.00E+00 |
| CE-141 | 2.22E+04 | 1.11E+04 | 1.64E+03 | 0.00E+00 | 4.86E+03 | 0.00E+00 | 1.38E+07 | 0.00E+00 |
| BA-142 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| LA-142 | 5.26E-92 | 1.68E-92 | 5.25E-93 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.32E-87 | 0.00E+00 |
| CE-143 | 3.17E-02 | 1.72E+01 | 2.49E-03 | 0.00E+00 | 7.21E-03 | 0.00E+00 | 2.52E+02 | 0.00E+00 |
| PR-143 | 3.34E+04 | 1.00E+04 | 1.66E+03 | 0.00E+00 | 5.43E+03 | 0.00E+00 | 3.60E+07 | 0.00E+00 |
| CE-144 | 2.32E+06 | 7.26E+05 | 1.24E+05 | 0.00E+00 | 4.02E+05 | 0.00E+00 | 1.89E+08 | 0.00E+00 |
| PR-144 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ND-147 | 1.17E+04 | 9.47E+03 | 7.33E+02 | 0.00E+00 | 5.19E+03 | 0.00E+00 | 1.50E+07 | 0.00E+00 |
| PM-147 | 1.52E+06 | 1.08E+05 | 5.81E+04 | 0.00E+00 | 1.91E+05 | 0.00E+00 | 4.38E+07 | 0.00E+00 |
| PM-148m | 2.70E+05 | 5.37E+04 | 5.37E+04 | 0.00E+00 | 7.96E+04 | 0.00E+00 | 1.51E+08 | 0.00E+00 |
| PM-148 | 3.10E+03 | 3.72E+02 | 2.41E+02 | 0.00E+00 | 6.33E+02 | 0.00E+00 | 9.95E+06 | 0.00E+00 |
| PM-149 | 8.18E+00 | 8.69E-01 | 4.71E-01 | 0.00E+00 | 1.54E+00 | 0.00E+00 | 5.93E+04 | 0.00E+00 |
| PM-151 | 9.00E-03 | 1.09E-03 | 7.12E-04 | 0.00E+00 | 1.86E-03 | 0.00E+00 | 1.24E+02 | 0.00E+00 |
| SM-151 | 1.31E+06 | 1.95E+05 | 6.13E+04 | 0.00E+00 | 2.01E+05 | 0.00E+00 | 2.82E+07 | 0.00E+00 |

Table 4-42 (Page 4 of 4)

Child Meat $R_i$

$m^2$*mrem*sec/yr*µCi

| Nuclide | Bone | Liver | T Body | Thyroid | Kidney | Lung | GI-LLI | Skin |
|---|---|---|---|---|---|---|---|---|
| SM-153 | 1.82E+00 | 1.13E+00 | 1.09E-01 | 0.00E+00 | 3.44E-01 | 0.00E+00 | 1.50E+04 | 0.00E+00 |
| EU-152 | 3.00E+06 | 5.46E+05 | 6.49E+05 | 0.00E+00 | 2.31E+06 | 0.00E+00 | 8.98E+07 | 0.00E+00 |
| EU-154 | 1.12E+07 | 1.01E+06 | 9.19E+05 | 0.00E+00 | 4.42E+06 | 0.00E+00 | 2.34E+08 | 0.00E+00 |
| EU-155 | 2.33E+06 | 1.68E+05 | 1.31E+05 | 0.00E+00 | 6.28E+05 | 0.00E+00 | 4.20E+08 | 0.00E+00 |
| EU-156 | 5.75E+04 | 3.08E+04 | 6.38E+03 | 0.00E+00 | 1.99E+04 | 0.00E+00 | 6.99E+07 | 0.00E+00 |
| TB-160 | 5.16E+05 | 0.00E+00 | 6.41E+04 | 0.00E+00 | 1.54E+05 | 0.00E+00 | 1.14E+08 | 0.00E+00 |
| HO-166m | 4.86E+06 | 1.02E+06 | 8.59E+05 | 0.00E+00 | 1.45E+06 | 0.00E+00 | 4.50E-12 | 0.00E+00 |
| W-181 | 4.49E+04 | 1.10E+04 | 1.52E+03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 4.02E+05 | 0.00E+00 |
| W-185 | 1.61E+06 | 4.02E+05 | 5.63E+04 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.50E+07 | 0.00E+00 |
| W-187 | 3.21E-02 | 1.90E-02 | 8.53E-03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.67E+00 | 0.00E+00 |
| NP-239 | 4.26E-01 | 3.06E-02 | 2.15E-02 | 0.00E+00 | 8.85E-02 | 0.00E+00 | 2.26E+03 | 0.00E+00 |
| U-232 | 6.11E+09 | 0.00E+00 | 4.37E+08 | 0.00E+00 | 4.65E+08 | 0.00E+00 | 2.42E+07 | 0.00E+00 |
| U-233 | 1.29E+09 | 0.00E+00 | 7.82E+07 | 0.00E+00 | 2.12E+08 | 0.00E+00 | 2.24E+07 | 0.00E+00 |
| U-234 | 1.24E+09 | 0.00E+00 | 7.68E+07 | 0.00E+00 | 2.08E+08 | 0.00E+00 | 2.20E+07 | 0.00E+00 |
| U-235 | 1.19E+09 | 0.00E+00 | 7.19E+07 | 0.00E+00 | 1.95E+08 | 0.00E+00 | 2.79E+07 | 0.00E+00 |
| U-236 | 1.19E+09 | 0.00E+00 | 7.37E+07 | 0.00E+00 | 1.99E+08 | 0.00E+00 | 2.06E+07 | 0.00E+00 |
| U-237 | 3.41E+03 | 0.00E+00 | 9.07E+02 | 0.00E+00 | 9.85E+03 | 0.00E+00 | 3.01E+05 | 0.00E+00 |
| U-238 | 1.14E+09 | 0.00E+00 | 6.74E+07 | 0.00E+00 | 1.82E+08 | 0.00E+00 | 1.97E+07 | 0.00E+00 |
| NP-237 | 4.56E+08 | 3.01E+07 | 2.00E+07 | 0.00E+00 | 1.24E+08 | 0.00E+00 | 1.67E+07 | 0.00E+00 |
| NP-238 | 2.23E+00 | 4.50E-02 | 3.47E-02 | 0.00E+00 | 1.44E-01 | 0.00E+00 | 1.54E+03 | 0.00E+00 |
| PU-238 | 1.70E+07 | 1.97E+06 | 4.52E+05 | 0.00E+00 | 1.64E+06 | 0.00E+00 | 1.07E+06 | 0.00E+00 |
| PU-239 | 1.85E+07 | 1.97E+06 | 4.74E+05 | 0.00E+00 | 1.75E+06 | 0.00E+00 | 9.80E+05 | 0.00E+00 |
| PU-240 | 1.83E+07 | 2.05E+06 | 4.74E+05 | 0.00E+00 | 1.75E+06 | 0.00E+00 | 9.99E+05 | 0.00E+00 |
| PU-241 | 5.51E+05 | 2.25E+04 | 1.14E+04 | 0.00E+00 | 4.21E+04 | 0.00E+00 | 2.05E+04 | 0.00E+00 |
| PU-242 | 1.70E+07 | 1.97E+06 | 4.57E+05 | 0.00E+00 | 1.67E+06 | 0.00E+00 | 9.60E+05 | 0.00E+00 |
| PU-244 | 1.99E+07 | 2.26E+07 | 5.22E+05 | 0.00E+00 | 1.93E+06 | 0.00E+00 | 1.43E+06 | 0.00E+00 |
| AM-241 | 2.78E+08 | 2.39E+08 | 2.08E+07 | 0.00E+00 | 1.27E+08 | 0.00E+00 | 1.56E+07 | 0.00E+00 |
| AM-242m | 2.86E+08 | 2.29E+08 | 2.13E+07 | 0.00E+00 | 1.29E+08 | 0.00E+00 | 1.96E+07 | 0.00E+00 |
| AM-243 | 2.74E+08 | 2.31E+08 | 2.01E+07 | 0.00E+00 | 1.24E+08 | 0.00E+00 | 1.83E+07 | 0.00E+00 |
| CM-242 | 1.52E+07 | 1.21E+07 | 1.01E+06 | 0.00E+00 | 3.23E+06 | 0.00E+00 | 1.41E+07 | 0.00E+00 |
| CM-243 | 2.61E+08 | 2.12E+08 | 1.68E+07 | 0.00E+00 | 6.28E+07 | 0.00E+00 | 1.64E+07 | 0.00E+00 |
| CM-244 | 2.20E+08 | 1.78E+08 | 1.41E+07 | 0.00E+00 | 5.17E+07 | 0.00E+00 | 1.58E+07 | 0.00E+00 |
| CM-245 | 3.41E+08 | 2.74E+08 | 2.15E+07 | 0.00E+00 | 8.40E+07 | 0.00E+00 | 1.48E+07 | 0.00E+00 |
| CM-246 | 3.37E+08 | 2.74E+08 | 2.15E+07 | 0.00E+00 | 8.38E+07 | 0.00E+00 | 1.45E+07 | 0.00E+00 |
| CM-247 | 3.29E+08 | 2.70E+08 | 2.11E+07 | 0.00E+00 | 8.26E+07 | 0.00E+00 | 1.91E+07 | 0.00E+00 |
| CM-248 | 2.74E+09 | 2.23E+09 | 1.74E+08 | 0.00E+00 | 6.81E+08 | 0.00E+00 | 3.09E+08 | 0.00E+00 |
| CF-252 | 2.09E+08 | 0.00E+00 | 5.05E+06 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.88E+07 | 0.00E+00 |

Table 4-43 (Page 1 of 4)

Teen Meat $R_i$

$m^2$*mrem*sec/yr*µCi

| Nuclide | Bone | Liver | T Body | Thyroid | Kidney | Lung | GI-LLI | Skin |
|---|---|---|---|---|---|---|---|---|
| H-3 | 0.00E+00 | 1.10E+02 | 1.10E+02 | 1.10E+02 | 1.10E+02 | 1.10E+02 | 1.10E+02 | 0.00E+00 |
| C-14 | 2.81E+05 | 5.62E+04 | 5.62E+04 | 5.62E+04 | 5.62E+04 | 5.62E+04 | 5.62E+04 | 0.00E+00 |
| NA-22 | 1.10E+09 | 1.10E+09 | 1.10E+09 | 1.10E+09 | 1.10E+09 | 1.10E+09 | 1.10E+09 | 0.00E+00 |
| NA-24 | 1.08E-03 | 1.08E-03 | 1.08E-03 | 1.08E-03 | 1.08E-03 | 1.08E-03 | 1.08E-03 | 0.00E+00 |
| P-32 | 3.93E+09 | 2.44E+08 | 1.53E+08 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.31E+08 | 0.00E+00 |
| CA-41 | 1.28E+09 | 0.00E+00 | 1.38E+08 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.26E+06 | 0.00E+00 |
| SC-46 | 1.36E+05 | 2.65E+05 | 7.87E+04 | 0.00E+00 | 2.54E+05 | 0.00E+00 | 9.04E+08 | 0.00E+00 |
| CR-51 | 0.00E+00 | 0.00E+00 | 5.64E+03 | 3.13E+03 | 1.24E+03 | 8.05E+03 | 9.47E+05 | 0.00E+00 |
| MN-54 | 0.00E+00 | 7.00E+06 | 1.39E+06 | 0.00E+00 | 2.09E+06 | 0.00E+00 | 1.44E+07 | 0.00E+00 |
| FE-55 | 2.38E+08 | 1.69E+08 | 3.94E+07 | 0.00E+00 | 0.00E+00 | 1.07E+08 | 7.31E+07 | 0.00E+00 |
| MN-56 | 0.00E+00 | 1.23E-53 | 2.19E-54 | 0.00E+00 | 1.56E-53 | 0.00E+00 | 8.10E-52 | 0.00E+00 |
| CO-57 | 0.00E+00 | 4.53E+06 | 7.59E+06 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 8.45E+07 | 0.00E+00 |
| CO-58 | 0.00E+00 | 1.41E+07 | 3.24E+07 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.94E+08 | 0.00E+00 |
| FE-59 | 2.12E+08 | 4.95E+08 | 1.91E+08 | 0.00E+00 | 0.00E+00 | 1.56E+08 | 1.17E+09 | 0.00E+00 |
| CO-60 | 0.00E+00 | 5.83E+07 | 1.31E+08 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.60E+08 | 0.00E+00 |
| NI-59 | 1.13E+08 | 4.00E+07 | 1.92E+07 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.28E+06 | 0.00E+00 |
| NI-63 | 1.52E+09 | 1.07E+08 | 5.15E+07 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.71E+07 | 0.00E+00 |
| CU-64 | 0.00E+00 | 2.21E-07 | 1.04E-07 | 0.00E+00 | 5.60E-07 | 0.00E+00 | 1.72E-05 | 0.00E+00 |
| NI-65 | 1.88E-53 | 2.41E-54 | 1.10E-54 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.30E-52 | 0.00E+00 |
| ZN-65 | 2.50E+08 | 8.69E+08 | 4.05E+08 | 0.00E+00 | 5.56E+08 | 0.00E+00 | 3.68E+08 | 0.00E+00 |
| ZN-69m | 1.40E-05 | 3.30E-05 | 3.02E-06 | 0.00E+00 | 2.00E-05 | 0.00E+00 | 1.81E-03 | 0.00E+00 |
| ZN-69 | 1.53E-153 | 2.91E-153 | 2.04E-154 | 0.00E+00 | 1.90E-153 | 0.00E+00 | 5.36E-153 | 0.00E+00 |
| SE-79 | 0.00E+00 | 9.07E+07 | 1.52E+07 | 0.00E+00 | 1.58E+08 | 0.00E+00 | 1.39E+07 | 0.00E+00 |
| BR-82 | 0.00E+00 | 0.00E+00 | 9.72E+02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| BR-83 | 0.00E+00 | 0.00E+00 | 5.07E-57 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| BR-84 | 0.00E+00 | 0.00E+00 | 5.42E-270 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| BR-85 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RB-86 | 0.00E+00 | 4.07E+08 | 1.91E+08 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.02E+07 | 0.00E+00 |
| RB-87 | 0.00E+00 | 8.79E+08 | 3.07E+08 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.07E+07 | 0.00E+00 |
| RB-88 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RB-89 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| SR-89 | 2.55E+08 | 0.00E+00 | 7.29E+06 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.03E+07 | 0.00E+00 |
| SR-90 | 9.89E+09 | 0.00E+00 | 1.98E+08 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.26E+08 | 0.00E+00 |
| Y-90 | 9.06E+01 | 0.00E+00 | 2.44E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.47E+05 | 0.00E+00 |
| SR-91 | 1.28E-10 | 0.00E+00 | 5.08E-12 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.79E-10 | 0.00E+00 |
| Y-91m | 5.85E-175 | 0.00E+00 | 2.24E-176 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.76E-173 | 0.00E+00 |
| Y-91 | 9.54E+05 | 0.00E+00 | 2.56E+04 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.91E+08 | 0.00E+00 |

Table 4-43 (Page 2 of 4)

Teen Meat $R_i$

$m^2$*mrem*sec/yr*µCi

| Nuclide | Bone | Liver | T Body | Thyroid | Kidney | Lung | GI-LLI | Skin |
|---|---|---|---|---|---|---|---|---|
| SR-92 | 9.88E-50 | 0.00E+00 | 4.21E-51 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.52E-48 | 0.00E+00 |
| Y-92 | 1.28E-39 | 0.00E+00 | 3.71E-41 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.52E-35 | 0.00E+00 |
| Y-93 | 3.96E-12 | 0.00E+00 | 1.09E-13 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.21E-07 | 0.00E+00 |
| NB-93m | 1.55E+07 | 5.10E+06 | 1.28E+06 | 0.00E+00 | 5.96E+06 | 0.00E+00 | 1.84E+09 | 0.00E+00 |
| NB-95 | 1.79E+06 | 9.95E+05 | 5.48E+05 | 0.00E+00 | 9.65E+05 | 0.00E+00 | 4.26E+09 | 0.00E+00 |
| NB-97 | 4.92E-119 | 1.22E-119 | 4.46E-120 | 0.00E+00 | 1.43E-119 | 0.00E+00 | 2.92E-115 | 0.00E+00 |
| ZR-93 | 3.05E+06 | 1.50E+06 | 8.21E+05 | 0.00E+00 | 5.32E+06 | 0.00E+00 | 1.42E+09 | 0.00E+00 |
| ZR-95 | 1.50E+06 | 4.73E+05 | 3.25E+05 | 0.00E+00 | 6.95E+05 | 0.00E+00 | 1.09E+09 | 0.00E+00 |
| ZR-97 | 1.72E-05 | 3.41E-06 | 1.57E-06 | 0.00E+00 | 5.17E-06 | 0.00E+00 | 9.23E-01 | 0.00E+00 |
| MO-93 | 0.00E+00 | 1.37E+08 | 3.76E+06 | 0.00E+00 | 3.94E+07 | 0.00E+00 | 1.67E+07 | 0.00E+00 |
| MO-99 | 0.00E+00 | 8.27E+04 | 1.58E+04 | 0.00E+00 | 1.89E+05 | 0.00E+00 | 1.48E+05 | 0.00E+00 |
| TC-99 | 1.16E+08 | 1.70E+08 | 4.65E+07 | 0.00E+00 | 2.17E+09 | 1.76E+07 | 4.17E+09 | 0.00E+00 |
| TC-99m | 3.53E-21 | 9.86E-21 | 1.28E-19 | 0.00E+00 | 1.47E-19 | 5.47E-21 | 6.47E-18 | 0.00E+00 |
| TC-101 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RU-103 | 8.57E+07 | 0.00E+00 | 3.66E+07 | 0.00E+00 | 3.02E+08 | 0.00E+00 | 7.16E+09 | 0.00E+00 |
| RU-105 | 4.83E-28 | 0.00E+00 | 1.87E-28 | 0.00E+00 | 6.09E-27 | 0.00E+00 | 3.90E-25 | 0.00E+00 |
| RU-106 | 2.36E+09 | 0.00E+00 | 2.97E+08 | 0.00E+00 | 4.55E+09 | 0.00E+00 | 1.13E+11 | 0.00E+00 |
| RH-105 | 3.25E+00 | 2.35E+00 | 1.54E+00 | 0.00E+00 | 9.96E+00 | 0.00E+00 | 2.98E+02 | 0.00E+00 |
| PD-107 | 0.00E+00 | 1.35E+06 | 8.69E+04 | 0.00E+00 | 1.22E+07 | 0.00E+00 | 6.26E+06 | 0.00E+00 |
| PD-109 | 0.00E+00 | 1.11E-06 | 2.51E-07 | 0.00E+00 | 6.39E-06 | 0.00E+00 | 1.11E-04 | 0.00E+00 |
| AG-110m | 5.06E+06 | 4.79E+06 | 2.91E+06 | 0.00E+00 | 9.13E+06 | 0.00E+00 | 1.34E+09 | 0.00E+00 |
| AG-111 | 1.24E+05 | 5.13E+04 | 2.58E+04 | 0.00E+00 | 1.67E+05 | 0.00E+00 | 7.15E+07 | 0.00E+00 |
| CD-113m | 0.00E+00 | 3.85E+06 | 1.24E+05 | 0.00E+00 | 4.26E+06 | 0.00E+00 | 2.31E+07 | 0.00E+00 |
| CD-115m | 0.00E+00 | 1.25E+06 | 4.02E+04 | 0.00E+00 | 9.96E+05 | 0.00E+00 | 3.94E+07 | 0.00E+00 |
| SN-123 | 4.66E+09 | 7.66E+07 | 1.13E+08 | 6.14E+07 | 0.00E+00 | 0.00E+00 | 7.05E+09 | 0.00E+00 |
| SN-125 | 1.49E+08 | 2.97E+06 | 6.73E+06 | 2.33E+06 | 0.00E+00 | 0.00E+00 | 1.40E+09 | 0.00E+00 |
| SN-126 | 1.50E+10 | 2.80E+08 | 4.28E+08 | 7.38E+07 | 0.00E+00 | 0.00E+00 | 3.34E+09 | 0.00E+00 |
| SB-124 | 1.62E+07 | 2.98E+05 | 6.31E+06 | 3.67E+04 | 0.00E+00 | 1.41E+07 | 3.26E+08 | 0.00E+00 |
| SB-125 | 1.56E+07 | 1.71E+05 | 3.66E+06 | 1.49E+04 | 0.00E+00 | 1.37E+07 | 1.22E+08 | 0.00E+00 |
| SB-126 | 1.58E+06 | 3.23E+04 | 5.68E+05 | 8.94E+03 | 0.00E+00 | 1.13E+06 | 9.35E+07 | 0.00E+00 |
| SB-127 | 1.38E+04 | 2.95E+02 | 5.21E+03 | 1.55E+02 | 0.00E+00 | 9.39E+03 | 2.34E+06 | 0.00E+00 |
| TE-125m | 3.03E+08 | 1.09E+08 | 4.05E+07 | 8.47E+07 | 0.00E+00 | 0.00E+00 | 8.94E+08 | 0.00E+00 |
| TE-127m | 9.41E+08 | 3.34E+08 | 1.12E+08 | 2.24E+08 | 3.82E+09 | 0.00E+00 | 2.35E+09 | 0.00E+00 |
| TE-127 | 1.80E-10 | 6.38E-11 | 3.88E-11 | 1.24E-10 | 7.29E-10 | 0.00E+00 | 1.39E-08 | 0.00E+00 |
| TE-129m | 9.50E+08 | 3.53E+08 | 1.50E+08 | 3.07E+08 | 3.97E+09 | 0.00E+00 | 3.57E+09 | 0.00E+00 |
| TE-129 | 3.76E-121 | 1.40E-121 | 9.16E-122 | 2.69E-121 | 1.58E-120 | 0.00E+00 | 2.06E-120 | 0.00E+00 |
| TE-133m | 4.67E-153 | 2.66E-153 | 2.58E-153 | 3.71E-153 | 2.63E-152 | 0.00E+00 | 1.07E-152 | 0.00E+00 |

Table 4-43 (Page 3 of 4)

Teen Meat $R_i$

$m^2$*mrem*sec/yr*µCi

| Nuclide | Bone | Liver | T Body | Thyroid | Kidney | Lung | GI-LLI | Skin |
|---|---|---|---|---|---|---|---|---|
| TE-134 | 2.59E-204 | 1.67E-204 | 1.74E-204 | 2.13E-204 | 1.59E-203 | 0.00E+00 | 9.63E-206 | 0.00E+00 |
| I-129 | 1.10E+08 | 9.21E+07 | 1.54E+08 | 1.12E+11 | 1.65E+08 | 0.00E+00 | 1.07E+07 | 0.00E+00 |
| I-130 | 1.70E-06 | 4.91E-06 | 1.96E-06 | 4.00E-04 | 7.56E-06 | 0.00E+00 | 3.77E-06 | 0.00E+00 |
| I-131 | 8.92E+06 | 1.25E+07 | 6.71E+06 | 3.65E+09 | 2.15E+07 | 0.00E+00 | 2.47E+06 | 0.00E+00 |
| TE-131m | 3.76E+02 | 1.80E+02 | 1.50E+02 | 2.71E+02 | 1.88E+03 | 0.00E+00 | 1.45E+04 | 0.00E+00 |
| TE-131 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| I-132 | 5.66E-59 | 1.48E-58 | 5.31E-59 | 4.99E-57 | 2.33E-58 | 0.00E+00 | 6.45E-59 | 0.00E+00 |
| TE-132 | 1.16E+06 | 7.36E+05 | 6.92E+05 | 7.76E+05 | 7.06E+06 | 0.00E+00 | 2.33E+07 | 0.00E+00 |
| I-133 | 3.05E-01 | 5.18E-01 | 1.58E-01 | 7.23E+01 | 9.09E-01 | 0.00E+00 | 3.92E-01 | 0.00E+00 |
| CS-134m | 2.13E-47 | 4.42E-47 | 2.27E-47 | 0.00E+00 | 2.46E-47 | 4.32E-48 | 2.94E-47 | 0.00E+00 |
| CS-134 | 5.23E+08 | 1.23E+09 | 5.71E+08 | 0.00E+00 | 3.91E+08 | 1.49E+08 | 1.53E+07 | 0.00E+00 |
| I-134 | 8.66E-162 | 2.30E-161 | 8.24E-162 | 3.83E-160 | 3.62E-161 | 0.00E+00 | 3.02E-163 | 0.00E+00 |
| I-135 | 3.60E-17 | 9.27E-17 | 3.44E-17 | 5.96E-15 | 1.46E-16 | 0.00E+00 | 1.03E-16 | 0.00E+00 |
| CS-135 | 1.80E+08 | 1.65E+08 | 3.86E+07 | 0.00E+00 | 6.31E+07 | 2.28E+07 | 2.89E+06 | 0.00E+00 |
| CS-136 | 9.40E+06 | 3.70E+07 | 2.48E+07 | 0.00E+00 | 2.01E+07 | 3.17E+06 | 2.98E+06 | 0.00E+00 |
| CS-137 | 7.24E+08 | 9.63E+08 | 3.36E+08 | 0.00E+00 | 3.28E+08 | 1.27E+08 | 1.37E+07 | 0.00E+00 |
| CS-138 | 2.23E-267 | 4.28E-267 | 2.14E-267 | 0.00E+00 | 3.16E-267 | 3.68E-268 | 1.94E-270 | 0.00E+00 |
| CS-139 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| BA-139 | 1.05E-101 | 7.41E-105 | 3.07E-103 | 0.00E+00 | 6.98E-105 | 5.10E-105 | 9.39E-101 | 0.00E+00 |
| BA-140 | 2.38E+07 | 2.91E+04 | 1.53E+06 | 0.00E+00 | 9.87E+03 | 1.96E+04 | 3.66E+07 | 0.00E+00 |
| LA-140 | 3.05E-02 | 1.50E-02 | 3.99E-03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 8.61E+02 | 0.00E+00 |
| BA-141 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| LA-141 | 3.29E-37 | 1.01E-37 | 1.67E-38 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.79E-32 | 0.00E+00 |
| CE-141 | 1.18E+04 | 7.87E+03 | 9.04E+02 | 0.00E+00 | 3.71E+03 | 0.00E+00 | 2.25E+07 | 0.00E+00 |
| BA-142 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| LA-142 | 2.85E-92 | 1.26E-92 | 3.15E-93 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.85E-88 | 0.00E+00 |
| CE-143 | 1.69E-02 | 1.23E+01 | 1.37E-03 | 0.00E+00 | 5.51E-03 | 0.00E+00 | 3.69E+02 | 0.00E+00 |
| PR-143 | 1.76E+04 | 7.04E+03 | 8.78E+02 | 0.00E+00 | 4.09E+03 | 0.00E+00 | 5.80E+07 | 0.00E+00 |
| CE-144 | 1.23E+06 | 5.08E+05 | 6.60E+04 | 0.00E+00 | 3.04E+05 | 0.00E+00 | 3.09E+08 | 0.00E+00 |
| PR-144 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ND-147 | 6.23E+03 | 6.77E+03 | 4.06E+02 | 0.00E+00 | 3.98E+03 | 0.00E+00 | 2.44E+07 | 0.00E+00 |
| PM-147 | 7.93E+05 | 7.53E+04 | 3.07E+04 | 0.00E+00 | 1.44E+05 | 0.00E+00 | 7.16E+07 | 0.00E+00 |
| PM-148m | 1.72E+05 | 4.36E+04 | 3.41E+04 | 0.00E+00 | 6.60E+04 | 0.00E+00 | 2.74E+08 | 0.00E+00 |
| PM-148 | 1.66E+03 | 2.70E+02 | 1.36E+02 | 0.00E+00 | 4.88E+02 | 0.00E+00 | 1.61E+07 | 0.00E+00 |
| PM-149 | 4.33E+00 | 6.09E-01 | 2.50E-01 | 0.00E+00 | 1.16E+00 | 0.00E+00 | 8.97E+04 | 0.00E+00 |
| PM-151 | 4.82E-03 | 7.96E-04 | 4.03E-04 | 0.00E+00 | 1.43E-03 | 0.00E+00 | 1.79E+02 | 0.00E+00 |
| SM-151 | 7.07E+05 | 1.36E+05 | 3.19E+04 | 0.00E+00 | 1.49E+05 | 0.00E+00 | 4.61E+07 | 0.00E+00 |

Table 4-43 (Page 4 of 4)

Teen Meat $R_i$

$m^2$*mrem*sec/yr*µCi

| Nuclide | Bone | Liver | T Body | Thyroid | Kidney | Lung | GI-LLI | Skin |
|---|---|---|---|---|---|---|---|---|
| SM-153 | 9.63E-01 | 7.97E-01 | 5.87E-02 | 0.00E+00 | 2.61E-01 | 0.00E+00 | 2.25E+04 | 0.00E+00 |
| EU-152 | 1.90E+06 | 4.56E+05 | 4.02E+05 | 0.00E+00 | 2.12E+06 | 0.00E+00 | 1.68E+08 | 0.00E+00 |
| EU-154 | 6.10E+06 | 7.87E+05 | 5.54E+05 | 0.00E+00 | 3.52E+06 | 0.00E+00 | 4.16E+08 | 0.00E+00 |
| EU-155 | 1.33E+06 | 1.29E+05 | 7.97E+04 | 0.00E+00 | 5.03E+05 | 0.00E+00 | 7.38E+08 | 0.00E+00 |
| EU-156 | 3.12E+04 | 2.34E+04 | 3.81E+03 | 0.00E+00 | 1.57E+04 | 0.00E+00 | 1.19E+08 | 0.00E+00 |
| TB-160 | 3.19E+05 | 0.00E+00 | 3.98E+04 | 0.00E+00 | 1.26E+05 | 0.00E+00 | 2.07E+08 | 0.00E+00 |
| HO-166m | 2.55E+06 | 7.84E+05 | 5.68E+05 | 0.00E+00 | 1.15E+06 | 0.00E+00 | 7.13E-12 | 0.00E+00 |
| W-181 | 2.39E+04 | 7.71E+03 | 8.06E+02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.57E+05 | 0.00E+00 |
| W-185 | 8.55E+05 | 2.82E+05 | 2.98E+04 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.44E+07 | 0.00E+00 |
| W-187 | 1.73E-02 | 1.41E-02 | 4.95E-03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.82E+00 | 0.00E+00 |
| NP-239 | 2.26E-01 | 2.14E-02 | 1.19E-02 | 0.00E+00 | 6.70E-02 | 0.00E+00 | 3.44E+03 | 0.00E+00 |
| U-232 | 3.24E+09 | 0.00E+00 | 2.32E+08 | 0.00E+00 | 3.51E+08 | 0.00E+00 | 3.96E+07 | 0.00E+00 |
| U-233 | 6.83E+08 | 0.00E+00 | 4.15E+07 | 0.00E+00 | 1.60E+08 | 0.00E+00 | 3.66E+07 | 0.00E+00 |
| U-234 | 6.56E+08 | 0.00E+00 | 4.07E+07 | 0.00E+00 | 1.57E+08 | 0.00E+00 | 3.59E+07 | 0.00E+00 |
| U-235 | 6.28E+08 | 0.00E+00 | 3.82E+07 | 0.00E+00 | 1.47E+08 | 0.00E+00 | 4.56E+07 | 0.00E+00 |
| U-236 | 6.28E+08 | 0.00E+00 | 3.91E+07 | 0.00E+00 | 1.50E+08 | 0.00E+00 | 3.37E+07 | 0.00E+00 |
| U-237 | 1.81E+03 | 0.00E+00 | 4.82E+02 | 0.00E+00 | 7.43E+03 | 0.00E+00 | 4.79E+05 | 0.00E+00 |
| U-238 | 6.01E+08 | 0.00E+00 | 3.58E+07 | 0.00E+00 | 1.38E+08 | 0.00E+00 | 3.21E+07 | 0.00E+00 |
| NP-237 | 4.31E+08 | 3.10E+07 | 1.90E+07 | 0.00E+00 | 1.40E+08 | 0.00E+00 | 2.73E+07 | 0.00E+00 |
| NP-238 | 1.18E+00 | 3.16E-02 | 1.84E-02 | 0.00E+00 | 1.08E-01 | 0.00E+00 | 2.32E+03 | 0.00E+00 |
| PU-238 | 1.52E+07 | 1.94E+06 | 4.13E+05 | 0.00E+00 | 1.77E+06 | 0.00E+00 | 1.75E+06 | 0.00E+00 |
| PU-239 | 1.74E+07 | 2.11E+06 | 4.56E+05 | 0.00E+00 | 1.94E+06 | 0.00E+00 | 1.60E+06 | 0.00E+00 |
| PU-240 | 1.73E+07 | 2.10E+06 | 4.56E+05 | 0.00E+00 | 1.94E+06 | 0.00E+00 | 1.63E+06 | 0.00E+00 |
| PU-241 | 3.95E+05 | 1.90E+04 | 8.33E+03 | 0.00E+00 | 3.86E+04 | 0.00E+00 | 3.34E+04 | 0.00E+00 |
| PU-242 | 1.61E+07 | 2.03E+06 | 4.40E+05 | 0.00E+00 | 1.87E+06 | 0.00E+00 | 1.57E+06 | 0.00E+00 |
| PU-244 | 1.88E+07 | 2.31E+06 | 5.04E+05 | 0.00E+00 | 2.14E+06 | 0.00E+00 | 2.34E+06 | 0.00E+00 |
| AM-241 | 2.59E+08 | 2.44E+08 | 1.86E+07 | 0.00E+00 | 1.40E+08 | 0.00E+00 | 2.55E+07 | 0.00E+00 |
| AM-242m | 2.61E+08 | 2.30E+08 | 1.88E+07 | 0.00E+00 | 1.39E+08 | 0.00E+00 | 3.21E+07 | 0.00E+00 |
| AM-243 | 2.58E+08 | 2.38E+08 | 1.82E+07 | 0.00E+00 | 1.37E+08 | 0.00E+00 | 2.99E+07 | 0.00E+00 |
| CM-242 | 8.06E+06 | 8.50E+06 | 5.35E+05 | 0.00E+00 | 2.44E+06 | 0.00E+00 | 2.30E+07 | 0.00E+00 |
| CM-243 | 2.10E+08 | 1.95E+08 | 1.32E+07 | 0.00E+00 | 6.17E+07 | 0.00E+00 | 2.68E+07 | 0.00E+00 |
| CM-244 | 1.63E+08 | 1.54E+08 | 1.03E+07 | 0.00E+00 | 4.81E+07 | 0.00E+00 | 2.58E+07 | 0.00E+00 |
| CM-245 | 3.21E+08 | 2.82E+08 | 1.98E+07 | 0.00E+00 | 9.24E+07 | 0.00E+00 | 2.42E+07 | 0.00E+00 |
| CM-246 | 3.18E+08 | 2.82E+08 | 1.97E+07 | 0.00E+00 | 9.20E+07 | 0.00E+00 | 2.38E+07 | 0.00E+00 |
| CM-247 | 3.10E+08 | 2.78E+08 | 1.94E+07 | 0.00E+00 | 9.08E+07 | 0.00E+00 | 3.12E+07 | 0.00E+00 |
| CM-248 | 2.58E+09 | 2.29E+09 | 1.60E+08 | 0.00E+00 | 7.49E+08 | 0.00E+00 | 5.02E+08 | 0.00E+00 |
| CF-252 | 1.09E+08 | 0.00E+00 | 2.64E+06 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 9.60E+07 | 0.00E+00 |

Table 4-44 (Page 1 of 4)

Adult Meat $R_i$

$m^2$*mrem*sec/yr*µCi

| Nuclide | Bone | Liver | T Body | Thyroid | Kidney | Lung | GI-LLI | Skin |
|---|---|---|---|---|---|---|---|---|
| H-3 | 0.00E+00 | 1.85E+02 | 1.85E+02 | 1.85E+02 | 1.85E+02 | 1.85E+02 | 1.85E+02 | 0.00E+00 |
| C-14 | 3.33E+05 | 6.66E+04 | 6.66E+04 | 6.66E+04 | 6.66E+04 | 6.66E+04 | 6.66E+04 | 0.00E+00 |
| NA-22 | 1.39E+09 | 1.39E+09 | 1.39E+09 | 1.39E+09 | 1.39E+09 | 1.39E+09 | 1.39E+09 | 0.00E+00 |
| NA-24 | 1.36E-03 | 1.36E-03 | 1.36E-03 | 1.36E-03 | 1.36E-03 | 1.36E-03 | 1.36E-03 | 0.00E+00 |
| P-32 | 4.66E+09 | 2.90E+08 | 1.80E+08 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.24E+08 | 0.00E+00 |
| CA-41 | 2.03E+09 | 0.00E+00 | 2.19E+08 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.02E+06 | 0.00E+00 |
| SC-46 | 1.76E+05 | 3.41E+05 | 9.91E+04 | 0.00E+00 | 3.18E+05 | 0.00E+00 | 1.66E+09 | 0.00E+00 |
| CR-51 | 0.00E+00 | 0.00E+00 | 7.05E+03 | 4.21E+03 | 1.55E+03 | 9.35E+03 | 1.77E+06 | 0.00E+00 |
| MN-54 | 0.00E+00 | 9.18E+06 | 1.75E+06 | 0.00E+00 | 2.73E+06 | 0.00E+00 | 2.81E+07 | 0.00E+00 |
| FE-55 | 2.93E+08 | 2.03E+08 | 4.72E+07 | 0.00E+00 | 0.00E+00 | 1.13E+08 | 1.16E+08 | 0.00E+00 |
| MN-56 | 0.00E+00 | 1.52E-53 | 2.69E-54 | 0.00E+00 | 1.92E-53 | 0.00E+00 | 4.84E-52 | 0.00E+00 |
| CO-57 | 0.00E+00 | 5.64E+06 | 9.37E+06 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.43E+08 | 0.00E+00 |
| CO-58 | 0.00E+00 | 1.82E+07 | 4.09E+07 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.69E+08 | 0.00E+00 |
| FE-59 | 2.66E+08 | 6.24E+08 | 2.39E+08 | 0.00E+00 | 0.00E+00 | 1.74E+08 | 2.08E+09 | 0.00E+00 |
| CO-60 | 0.00E+00 | 7.52E+07 | 1.66E+08 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.41E+09 | 0.00E+00 |
| NI-59 | 1.42E+08 | 4.87E+07 | 2.37E+07 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.00E+07 | 0.00E+00 |
| NI-63 | 1.89E+09 | 1.31E+08 | 6.33E+07 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.73E+07 | 0.00E+00 |
| CU-64 | 0.00E+00 | 2.71E-07 | 1.27E-07 | 0.00E+00 | 6.84E-07 | 0.00E+00 | 2.31E-05 | 0.00E+00 |
| NI-65 | 2.25E-53 | 2.92E-54 | 1.33E-54 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.40E-53 | 0.00E+00 |
| ZN-65 | 3.56E+08 | 1.13E+09 | 5.12E+08 | 0.00E+00 | 7.57E+08 | 0.00E+00 | 7.13E+08 | 0.00E+00 |
| ZN-69m | 1.68E-05 | 4.02E-05 | 3.68E-06 | 0.00E+00 | 2.43E-05 | 0.00E+00 | 2.45E-03 | 0.00E+00 |
| ZN-69 | 1.81E-153 | 3.46E-153 | 2.41E-154 | 0.00E+00 | 2.25E-153 | 0.00E+00 | 5.20E-154 | 0.00E+00 |
| SE-79 | 0.00E+00 | 1.08E+08 | 1.81E+07 | 0.00E+00 | 1.87E+08 | 0.00E+00 | 2.21E+07 | 0.00E+00 |
| BR-82 | 0.00E+00 | 0.00E+00 | 1.22E+03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.40E+03 | 0.00E+00 |
| BR-83 | 0.00E+00 | 0.00E+00 | 6.00E-57 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 8.65E-57 | 0.00E+00 |
| BR-84 | 0.00E+00 | 0.00E+00 | 6.62E-270 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.19E-275 | 0.00E+00 |
| BR-85 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RB-86 | 0.00E+00 | 4.87E+08 | 2.27E+08 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 9.60E+07 | 0.00E+00 |
| RB-87 | 0.00E+00 | 1.05E+09 | 3.64E+08 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 4.90E+07 | 0.00E+00 |
| RB-88 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RB-89 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| SR-89 | 3.02E+08 | 0.00E+00 | 8.66E+06 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 4.84E+07 | 0.00E+00 |
| SR-90 | 1.43E+10 | 0.00E+00 | 2.87E+08 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.59E+08 | 0.00E+00 |
| Y-90 | 1.08E+02 | 0.00E+00 | 2.89E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.14E+06 | 0.00E+00 |
| SR-91 | 1.52E-10 | 0.00E+00 | 6.14E-12 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.23E-10 | 0.00E+00 |
| Y-91m | 6.98E-175 | 0.00E+00 | 2.70E-176 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.05E-174 | 0.00E+00 |
| Y-91 | 1.13E+06 | 0.00E+00 | 3.03E+04 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.23E+08 | 0.00E+00 |

Table 4-44 (Page 2 of 4)

Adult Meat $R_i$

$m^2$*mrem*sec/yr*µCi

| Nuclide | Bone | Liver | T Body | Thyroid | Kidney | Lung | GI-LLI | Skin |
|---|---|---|---|---|---|---|---|---|
| SR-92 | 1.18E-49 | 0.00E+00 | 5.10E-51 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.33E-48 | 0.00E+00 |
| Y-92 | 1.52E-39 | 0.00E+00 | 4.43E-41 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.66E-35 | 0.00E+00 |
| Y-93 | 4.69E-12 | 0.00E+00 | 1.30E-13 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.49E-07 | 0.00E+00 |
| NB-93m | 1.95E+07 | 6.36E+06 | 1.57E+06 | 0.00E+00 | 7.31E+06 | 0.00E+00 | 2.93E+09 | 0.00E+00 |
| NB-95 | 2.30E+06 | 1.28E+06 | 6.87E+05 | 0.00E+00 | 1.26E+06 | 0.00E+00 | 7.76E+09 | 0.00E+00 |
| NB-97 | 5.90E-119 | 1.49E-119 | 5.45E-120 | 0.00E+00 | 1.74E-119 | 0.00E+00 | 5.50E-116 | 0.00E+00 |
| ZR-93 | 3.90E+06 | 2.18E+05 | 1.02E+05 | 0.00E+00 | 8.27E+05 | 0.00E+00 | 2.27E+08 | 0.00E+00 |
| ZR-95 | 1.87E+06 | 6.01E+05 | 4.07E+05 | 0.00E+00 | 9.42E+05 | 0.00E+00 | 1.90E+09 | 0.00E+00 |
| ZR-97 | 2.07E-05 | 4.17E-06 | 1.91E-06 | 0.00E+00 | 6.30E-06 | 0.00E+00 | 1.29E+00 | 0.00E+00 |
| MO-93 | 0.00E+00 | 1.65E+08 | 4.45E+06 | 0.00E+00 | 4.67E+07 | 0.00E+00 | 2.68E+07 | 0.00E+00 |
| MO-99 | 0.00E+00 | 1.00E+05 | 1.90E+04 | 0.00E+00 | 2.26E+05 | 0.00E+00 | 2.32E+05 | 0.00E+00 |
| TC-99 | 1.37E+08 | 2.04E+08 | 5.51E+07 | 0.00E+00 | 2.57E+09 | 1.73E+07 | 6.67E+09 | 0.00E+00 |
| TC-99m | 4.45E-21 | 1.26E-20 | 1.60E-19 | 0.00E+00 | 1.91E-19 | 6.16E-21 | 7.44E-18 | 0.00E+00 |
| TC-101 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RU-103 | 1.05E+08 | 0.00E+00 | 4.53E+07 | 0.00E+00 | 4.01E+08 | 0.00E+00 | 1.23E+10 | 0.00E+00 |
| RU-105 | 5.78E-28 | 0.00E+00 | 2.28E-28 | 0.00E+00 | 7.46E-27 | 0.00E+00 | 3.53E-25 | 0.00E+00 |
| RU-106 | 2.80E+09 | 0.00E+00 | 3.54E+08 | 0.00E+00 | 5.40E+09 | 0.00E+00 | 1.81E+11 | 0.00E+00 |
| RH-105 | 3.84E+00 | 2.81E+00 | 1.85E+00 | 0.00E+00 | 1.19E+01 | 0.00E+00 | 4.48E+02 | 0.00E+00 |
| PD-107 | 0.00E+00 | 1.61E+06 | 1.03E+05 | 0.00E+00 | 1.45E+07 | 0.00E+00 | 9.99E+06 | 0.00E+00 |
| PD-109 | 0.00E+00 | 1.32E-06 | 2.97E-07 | 0.00E+00 | 7.53E-06 | 0.00E+00 | 1.46E-04 | 0.00E+00 |
| AG-110m | 6.68E+06 | 6.18E+06 | 3.67E+06 | 0.00E+00 | 1.22E+07 | 0.00E+00 | 2.52E+09 | 0.00E+00 |
| AG-111 | 1.47E+05 | 6.13E+04 | 3.05E+04 | 0.00E+00 | 1.98E+05 | 0.00E+00 | 1.12E+08 | 0.00E+00 |
| CD-113m | 0.00E+00 | 4.60E+06 | 1.47E+05 | 0.00E+00 | 5.06E+06 | 0.00E+00 | 3.70E+07 | 0.00E+00 |
| CD-115m | 0.00E+00 | 1.49E+06 | 4.76E+04 | 0.00E+00 | 1.18E+06 | 0.00E+00 | 6.27E+07 | 0.00E+00 |
| SN-123 | 5.53E+09 | 9.16E+07 | 1.35E+08 | 7.79E+07 | 0.00E+00 | 0.00E+00 | 1.13E+10 | 0.00E+00 |
| SN-125 | 1.77E+08 | 3.56E+06 | 8.01E+06 | 2.95E+06 | 0.00E+00 | 0.00E+00 | 2.21E+09 | 0.00E+00 |
| SN-126 | 1.85E+10 | 3.66E+08 | 5.27E+08 | 1.08E+08 | 0.00E+00 | 0.00E+00 | 5.33E+09 | 0.00E+00 |
| SB-124 | 1.98E+07 | 3.74E+05 | 7.84E+06 | 4.80E+04 | 0.00E+00 | 1.54E+07 | 5.62E+08 | 0.00E+00 |
| SB-125 | 1.91E+07 | 2.13E+05 | 4.55E+06 | 1.94E+04 | 0.00E+00 | 1.47E+07 | 2.10E+08 | 0.00E+00 |
| SB-126 | 1.93E+06 | 3.94E+04 | 6.98E+05 | 1.18E+04 | 0.00E+00 | 1.19E+06 | 1.58E+08 | 0.00E+00 |
| SB-127 | 1.66E+04 | 3.63E+02 | 6.37E+03 | 1.99E+02 | 0.00E+00 | 9.84E+03 | 3.80E+06 | 0.00E+00 |
| TE-125m | 3.59E+08 | 1.30E+08 | 4.81E+07 | 1.08E+08 | 1.46E+09 | 0.00E+00 | 1.43E+09 | 0.00E+00 |
| TE-127m | 1.12E+09 | 3.99E+08 | 1.36E+08 | 2.85E+08 | 4.53E+09 | 0.00E+00 | 3.74E+09 | 0.00E+00 |
| TE-127 | 2.12E-10 | 7.62E-11 | 4.59E-11 | 1.57E-10 | 8.64E-10 | 0.00E+00 | 1.67E-08 | 0.00E+00 |
| TE-129m | 1.13E+09 | 4.23E+08 | 1.79E+08 | 3.90E+08 | 4.73E+09 | 0.00E+00 | 5.71E+09 | 0.00E+00 |
| TE-129 | 4.47E-121 | 1.68E-121 | 1.09E-121 | 3.43E-121 | 1.88E-120 | 0.00E+00 | 3.37E-121 | 0.00E+00 |
| TE-133m | 5.67E-153 | 3.32E-153 | 3.19E-153 | 4.80E-153 | 3.28E-152 | 0.00E+00 | 1.14E-153 | 0.00E+00 |

Table 4-44 (Page 3 of 4)

Adult Meat $R_i$

$m^2$*mrem*sec/yr*µCi

| Nuclide | Bone | Liver | T Body | Thyroid | Kidney | Lung | GI-LLI | Skin |
|---|---|---|---|---|---|---|---|---|
| TE-134 | 3.18E-204 | 2.08E-204 | 1.28E-204 | 2.78E-204 | 2.01E-203 | 0.00E+00 | 3.53E-207 | 0.00E+00 |
| I-129 | 1.30E+08 | 1.12E+08 | 3.66E+08 | 2.88E+11 | 2.40E+08 | 0.00E+00 | 1.77E+07 | 0.00E+00 |
| I-130 | 2.11E-06 | 6.22E-06 | 2.45E-06 | 5.27E-04 | 9.71E-06 | 0.00E+00 | 5.35E-06 | 0.00E+00 |
| I-131 | 1.07E+07 | 1.54E+07 | 8.80E+06 | 5.03E+09 | 2.63E+07 | 0.00E+00 | 4.05E+06 | 0.00E+00 |
| TE-131m | 4.51E+02 | 2.21E+02 | 1.84E+02 | 3.49E+02 | 2.23E+03 | 0.00E+00 | 2.19E+04 | 0.00E+00 |
| TE-131 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| I-132 | 6.97E-59 | 1.86E-58 | 6.52E-59 | 6.52E-57 | 2.97E-58 | 0.00E+00 | 3.50E-59 | 0.00E+00 |
| TE-132 | 1.42E+06 | 9.18E+05 | 8.62E+05 | 1.01E+06 | 8.84E+06 | 0.00E+00 | 4.34E+07 | 0.00E+00 |
| I-133 | 3.65E-01 | 6.35E-01 | 1.94E-01 | 9.34E+01 | 1.11E+00 | 0.00E+00 | 5.71E-01 | 0.00E+00 |
| CS-134m | 2.62E-47 | 5.50E-47 | 2.81E-47 | 0.00E+00 | 2.98E-47 | 4.70E-48 | 1.94E-47 | 0.00E+00 |
| CS-134 | 6.58E+08 | 1.56E+09 | 1.28E+09 | 0.00E+00 | 5.06E+08 | 1.68E+08 | 2.74E+07 | 0.00E+00 |
| I-134 | 1.06E-161 | 2.89E-161 | 1.03E-161 | 5.01E-160 | 4.60E-161 | 0.00E+00 | 2.52E-164 | 0.00E+00 |
| I-135 | 4.43E-17 | 1.16E-16 | 4.28E-17 | 7.64E-15 | 1.86E-16 | 0.00E+00 | 1.31E-16 | 0.00E+00 |
| CS-135 | 2.14E+08 | 1.97E+08 | 8.76E+07 | 0.00E+00 | 7.47E+07 | 2.24E+07 | 4.62E+06 | 0.00E+00 |
| CS-136 | 1.21E+07 | 4.76E+07 | 3.43E+07 | 0.00E+00 | 2.65E+07 | 3.63E+06 | 5.41E+06 | 0.00E+00 |
| CS-137 | 8.72E+08 | 1.19E+09 | 7.81E+08 | 0.00E+00 | 4.05E+08 | 1.35E+08 | 2.31E+07 | 0.00E+00 |
| CS-138 | 2.68E-267 | 5.30E-267 | 2.63E-267 | 0.00E+00 | 3.90E-267 | 3.85E-268 | 2.26E-272 | 0.00E+00 |
| CS-139 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| BA-139 | 1.24E-101 | 8.86E-105 | 3.64E-103 | 0.00E+00 | 8.28E-105 | 5.02E-105 | 2.20E-101 | 0.00E+00 |
| BA-140 | 2.87E+07 | 3.61E+04 | 1.88E+06 | 0.00E+00 | 1.23E+04 | 2.07E+04 | 5.92E+07 | 0.00E+00 |
| LA-140 | 3.71E-02 | 1.87E-02 | 4.94E-03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.37E+03 | 0.00E+00 |
| BA-141 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| LA-141 | 3.90E-37 | 1.21E-37 | 1.98E-38 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.44E-32 | 0.00E+00 |
| CE-141 | 1.40E+04 | 9.50E+03 | 1.08E+03 | 0.00E+00 | 4.41E+03 | 0.00E+00 | 3.63E+07 | 0.00E+00 |
| BA-142 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| LA-142 | 3.45E-92 | 1.57E-92 | 3.90E-93 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.14E-88 | 0.00E+00 |
| CE-143 | 2.01E-02 | 1.48E+01 | 1.64E-03 | 0.00E+00 | 6.53E-03 | 0.00E+00 | 5.55E+02 | 0.00E+00 |
| PR-143 | 2.10E+04 | 8.41E+03 | 1.04E+03 | 0.00E+00 | 4.85E+03 | 0.00E+00 | 9.18E+07 | 0.00E+00 |
| CE-144 | 1.46E+06 | 6.09E+05 | 7.83E+04 | 0.00E+00 | 3.61E+05 | 0.00E+00 | 4.93E+08 | 0.00E+00 |
| PR-144 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ND-147 | 7.07E+03 | 8.17E+03 | 4.89E+02 | 0.00E+00 | 4.78E+03 | 0.00E+00 | 3.92E+07 | 0.00E+00 |
| PM-147 | 9.64E+05 | 9.07E+04 | 3.67E+04 | 0.00E+00 | 1.71E+05 | 0.00E+00 | 1.14E+08 | 0.00E+00 |
| PM-148m | 2.16E+05 | 5.58E+04 | 4.27E+04 | 0.00E+00 | 8.43E+04 | 0.00E+00 | 4.73E+08 | 0.00E+00 |
| PM-148 | 1.97E+03 | 3.28E+02 | 1.65E+02 | 0.00E+00 | 6.19E+02 | 0.00E+00 | 2.57E+07 | 0.00E+00 |
| PM-149 | 5.14E+00 | 7.27E-01 | 2.97E-01 | 0.00E+00 | 1.37E+00 | 0.00E+00 | 1.36E+05 | 0.00E+00 |
| PM-151 | 5.76E-03 | 9.67E-04 | 4.89E-04 | 0.00E+00 | 1.73E-03 | 0.00E+00 | 2.66E+02 | 0.00E+00 |
| SM-151 | 9.45E+05 | 1.63E+05 | 3.90E+04 | 0.00E+00 | 1.82E+05 | 0.00E+00 | 7.19E+07 | 0.00E+00 |

Table 4-44 (Page 4 of 4)

Adult Meat $R_i$

$m^2$*mrem*sec/yr*µCi

| Nuclide | Bone | Liver | T Body | Thyroid | Kidney | Lung | GI-LLI | Skin |
|---|---|---|---|---|---|---|---|---|
| SM-153 | 1.15E+00 | 9.55E-01 | 6.97E-02 | 0.00E+00 | 3.09E-01 | 0.00E+00 | 3.41E+04 | 0.00E+00 |
| EU-152 | 2.55E+06 | 5.81E+05 | 5.11E+05 | 0.00E+00 | 3.60E+06 | 0.00E+00 | 3.35E+08 | 0.00E+00 |
| EU-154 | 8.03E+06 | 9.87E+05 | 7.02E+05 | 0.00E+00 | 4.72E+06 | 0.00E+00 | 7.15E+08 | 0.00E+00 |
| EU-155 | 1.11E+06 | 1.58E+05 | 1.02E+05 | 0.00E+00 | 7.30E+05 | 0.00E+00 | 1.24E+08 | 0.00E+00 |
| EU-156 | 3.76E+04 | 2.91E+04 | 4.70E+03 | 0.00E+00 | 1.94E+04 | 0.00E+00 | 1.99E+08 | 0.00E+00 |
| TB-160 | 3.92E+05 | 0.00E+00 | 4.89E+04 | 0.00E+00 | 1.62E+05 | 0.00E+00 | 2.14E+08 | 0.00E+00 |
| HO-166m | 3.26E+06 | 1.02E+06 | 7.72E+05 | 0.00E+00 | 1.52E+06 | 0.00E+00 | 1.21E-11 | 0.00E+00 |
| W-181 | 2.82E+04 | 9.20E+03 | 9.86E+02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.05E+06 | 0.00E+00 |
| W-185 | 1.01E+06 | 3.37E+05 | 3.55E+04 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.90E+07 | 0.00E+00 |
| W-187 | 2.07E-02 | 1.73E-02 | 6.04E-03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.66E+00 | 0.00E+00 |
| NP-239 | 2.59E-01 | 2.55E-02 | 1.40E-02 | 0.00E+00 | 7.95E-02 | 0.00E+00 | 5.23E+03 | 0.00E+00 |
| U-232 | 3.85E+09 | 0.00E+00 | 2.75E+08 | 0.00E+00 | 4.16E+08 | 0.00E+00 | 6.32E+07 | 0.00E+00 |
| U-233 | 8.12E+08 | 0.00E+00 | 4.92E+07 | 0.00E+00 | 1.89E+08 | 0.00E+00 | 5.85E+07 | 0.00E+00 |
| U-234 | 7.80E+08 | 0.00E+00 | 4.82E+07 | 0.00E+00 | 1.86E+08 | 0.00E+00 | 5.73E+07 | 0.00E+00 |
| U-235 | 7.47E+08 | 0.00E+00 | 4.53E+07 | 0.00E+00 | 1.74E+08 | 0.00E+00 | 7.28E+07 | 0.00E+00 |
| U-236 | 7.47E+08 | 0.00E+00 | 4.62E+07 | 0.00E+00 | 1.78E+08 | 0.00E+00 | 5.37E+07 | 0.00E+00 |
| U-237 | 2.14E+03 | 0.00E+00 | 5.70E+02 | 0.00E+00 | 8.81E+03 | 0.00E+00 | 7.53E+05 | 0.00E+00 |
| U-238 | 7.15E+08 | 0.00E+00 | 4.23E+07 | 0.00E+00 | 1.63E+08 | 0.00E+00 | 5.13E+07 | 0.00E+00 |
| NP-237 | 6.91E+08 | 4.91E+07 | 3.04E+07 | 0.00E+00 | 2.26E+08 | 0.00E+00 | 4.36E+07 | 0.00E+00 |
| NP-238 | 1.40E+00 | 3.78E-02 | 2.18E-02 | 0.00E+00 | 1.28E-01 | 0.00E+00 | 3.51E+03 | 0.00E+00 |
| PU-238 | 2.42E+07 | 3.06E+06 | 6.56E+05 | 0.00E+00 | 2.81E+06 | 0.00E+00 | 2.80E+06 | 0.00E+00 |
| PU-239 | 2.78E+07 | 3.34E+06 | 7.33E+05 | 0.00E+00 | 3.11E+06 | 0.00E+00 | 2.56E+06 | 0.00E+00 |
| PU-240 | 2.78E+07 | 3.34E+06 | 7.33E+05 | 0.00E+00 | 3.11E+06 | 0.00E+00 | 2.60E+06 | 0.00E+00 |
| PU-241 | 6.00E+05 | 2.85E+04 | 1.27E+04 | 0.00E+00 | 5.84E+04 | 0.00E+00 | 5.35E+04 | 0.00E+00 |
| PU-242 | 2.58E+07 | 3.22E+06 | 7.06E+05 | 0.00E+00 | 3.00E+06 | 0.00E+00 | 2.51E+06 | 0.00E+00 |
| PU-244 | 3.01E+07 | 3.69E+06 | 8.10E+05 | 0.00E+00 | 3.44E+06 | 0.00E+00 | 3.74E+06 | 0.00E+00 |
| AM-241 | 4.14E+08 | 3.87E+08 | 2.97E+07 | 0.00E+00 | 2.23E+08 | 0.00E+00 | 4.07E+07 | 0.00E+00 |
| AM-242m | 4.17E+08 | 3.63E+08 | 2.98E+07 | 0.00E+00 | 2.22E+08 | 0.00E+00 | 5.12E+07 | 0.00E+00 |
| AM-243 | 4.14E+08 | 3.78E+08 | 2.91E+07 | 0.00E+00 | 2.19E+08 | 0.00E+00 | 4.77E+07 | 0.00E+00 |
| CM-242 | 9.56E+06 | 1.02E+07 | 6.36E+05 | 0.00E+00 | 2.89E+06 | 0.00E+00 | 3.67E+07 | 0.00E+00 |
| CM-243 | 3.28E+08 | 3.00E+08 | 2.05E+07 | 0.00E+00 | 9.57E+07 | 0.00E+00 | 4.27E+07 | 0.00E+00 |
| CM-244 | 2.49E+08 | 2.33E+08 | 1.57E+07 | 0.00E+00 | 7.32E+07 | 0.00E+00 | 4.12E+07 | 0.00E+00 |
| CM-245 | 5.14E+08 | 4.48E+08 | 3.16E+07 | 0.00E+00 | 1.48E+08 | 0.00E+00 | 3.86E+07 | 0.00E+00 |
| CM-246 | 5.10E+08 | 4.48E+08 | 3.15E+07 | 0.00E+00 | 1.47E+08 | 0.00E+00 | 3.79E+07 | 0.00E+00 |
| CM-247 | 4.97E+08 | 4.41E+08 | 3.11E+07 | 0.00E+00 | 1.45E+08 | 0.00E+00 | 4.99E+07 | 0.00E+00 |
| CM-248 | 4.14E+09 | 3.64E+09 | 2.56E+08 | 0.00E+00 | 1.20E+09 | 0.00E+00 | 8.06E+08 | 0.00E+00 |
| CF-252 | 1.39E+08 | 0.00E+00 | 3.35E+06 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.53E+08 | 0.00E+00 |

# 5.0 TOTAL DOSE

Radioactivity contained within tanks, pipes or other systems and contained radioactive material or waste stored on site can produce radiation at offsite locations. Annual offsite radiation doses near the station due to such sources were judged to be negligible in comparison with applicable limits except for doses due to BWR turbine skyshine, Independent Spent Fuel Storage Installations (ISFSI), and potential doses due to radioactive waste storage facilities (excludes radioactive material storage). Changes or modifications to the power station that may impact the offsite dose through increases to the direct radiation levels need to be evaluated on a case-by-case basis and added to the Radiological Effluent Controls (RECS) to the ODCM when applicable.

## 5.1 Total Dose Calculation Requirements

### 5.1.1 Total Effective Dose Equivalent Limits; 10CFR20 and 40CFR190

LaSalle Station is required to determine the total dose to a member of the public due to all uranium fuel cycle sources in order to assess compliance with 40CFR190 as part of demonstrating compliance with 10CFR20.

The total dose for the uranium fuel cycle is the sum of doses due to radioactivity in airborne and liquid effluents and the doses due to direct radiation from contained sources at the nuclear power station. When evaluation of total dose is required for a station, the following contributions are summed:

- Doses due to airborne and liquid effluents from the station.
- Doses due to liquid effluents from nuclear power stations upstream.
- Doses due to any onsite radioactive waste storage facilities, if applicable.
- Doses due to any onsite Independent Spent Fuel Storage Installations (ISFSI)
- Doses due to nitrogen – 16 ($N^{16}$) skyshine.

10CFR20 requires compliance to dose limits expressed as "Total Effective Dose Equivalent" (TEDE). Although annual dose limits in 10CFR20 are now expressed in terms of TEDEs, 40CFR190 limits remain stated as organ dose. The NRC continues to require 10CFR50 Appendix I and 40CFR190 doses to be reported in terms of organ dose and not TEDE. Due to the fact that organ dose limits set forth in 40CFR190 are substantially lower than those of 10CFR20 (25 mrem/yr vs. 100 mrem/yr), the NRC has stated that demonstration of compliance with the dose limits in 40CFR190 will be deemed as demonstration of compliance with the dose limits of

10CFR20 for most facilities (Reference 104). In addition to compliance with 40CFR190, it may be necessary for a nuclear power plant to address dose from on-site activity by members of the public.

### 5.1.2 Total Dose Calculation Methodology

There are presently two types of contained sources of radioactivity that are of concern in LaSalle Station's offsite radiological dose assessments. The first source is that due to gamma rays from nitrogen-16 ($^{16}N$) carried over to the turbine in BWR (boiling water reactor) steam. The second source is that due to gamma rays associated with radioactive material resident in onsite Independent Spent Fuel Storage Installations (ISFSI) and radwaste storage facilities.

Gamma radiation from these sources contributes to the total body dose (deep dose equivalent). In addition to the total body, skin and single organ dose assessments previously described, an additional assessment is required. The additional assessment addresses radiation dose due to radioactivity contained within the nuclear power station and its structures.

### 5.1.3 BWR Skyshine

The most significant dose component to members of the public produced by "contained sources" is nitrogen-16 ($^{16}N$) within the turbine building of BWRs. Although primary side shielding is around the turbine and its piping, $^{16}N$ gamma rays scattered by air molecules in the overhead air space above the turbine and piping cause a measurable "skyshine" radiation dose in the local power plant environs.

Equation 5-1 is used to evaluate skyshine dose. A complicating factor in the calculation is the practice at some stations of adding hydrogen to reactor coolant to improve coolant chemistry. The addition of hydrogen can increase the dose rate due to skyshine up to a factor of 10 times expected levels depending on injection rates and power levels (Reference 39). Increasing the hydrogen injection rate will increase the dose rates even further. (See Reference 102) The skyshine dose determined by Equation 5-1 depends on the following factors:

- The distance of the dose recipient location from the turbine.
- The number of hours per year that the location is occupied by a dose recipient.

- The total energy [MWe-hr] generated by the nuclear power station with hydrogen addition.
- The total energy [MWe-hr] generated by the nuclear power station without hydrogen addition.

### 5.1.4 Independent Spent Fuel Storage Installation (ISFSI)

10CFR72.104 dose limits are the same as those specified by 40CFR190.

Even a fully loaded ISFSI is not expected to become the prominent contributor to the limits in this section. ISFSI dose contribution is in the form of direct radiation as no liquid or gas releases are expected to occur. The 10CFR72.212 report prepared in accordance with ISFSI requirements assumes a certain array of casks exists on the pad. The dose contribution from this array of casks, in combination with historical uranium fuel cycle operations (e.g. LSCS 1 & 2) prior to ISFSI operations, was analyzed to be within the 40CFR190 and 10CFR72.104 limits.

If the dose limits of 40CFR190 or 10CFR72.104 are exceeded, a special report to the NRC as well as an appropriate request for exemption/variance is required to be submitted to the NRC.

The requirement that the dose limits of 10CFR72.104 apply to "any real individual" is controlled for ISFSI activities in the ISFSI 72.212 report. The nearest real individual to the ISFSI was also determined to be the nearest real individual to the plant. Therefore, for the purposes of analyzing dose, the member of the public as defined in 40CFR190 is the same as the real individual identified in the 72.212 report. The dose rate calculated to the nearest real individual from a fully loaded ISFSI (as listed in the 10CFR72.212 report) is 5.87E-02 mRem/year. To ensure compliance in a conservative fashion, one half of the annual ISFSI dose will be added to each Unit's external body dose, assuming a fully loaded ISFSI under the conditions listed in the LaSalle 10CFR72.212 report.

### 5.1.5 Non Fuel Waste (NFW) Storage

LaSalle has implemented Non Fuel Waste (NFW) storage on site. The waste is stored in above ground Non Fuel Waste Canisters (NFWCs) known as HI-SAFE storage modules. The waste is stored on the turning pads at the existing LaSalle ISFSI. A bounding study was performed based on data provided by the HI-

SAFE manufacturer and Site Engineering. No liquid or gaseous releases are expected to occur, as the NFWCs are sealed under vacuum. Thus, only dose contributions due to direct radiation are considered. The study concluded that in accordance with NRC guidance, there would not be a significant contribution to offsite doses with regard to the NFW storage.

## 5.2 BWR Skyshine Calculation

The contained onsite radioactivity source that results in the most significant offsite radiation levels at LaSalle Station is skyshine resulting from $^{16}N$ decay inside turbines and steam piping.

The $^{16}N$ that produces the skyshine effect is formulated through neutron activation of the oxygen atoms (oxygen-16, or $^{16}O$) in reactor coolant as the coolant passes through the operating reactor core. The $^{16}N$ travels with the steam produced in the reactor to the steam driven turbine. While the $^{16}N$ is in transport, it radioactively decays with a half-life of about 7 seconds and produces 6 to 7 MeV gamma rays. Typically, offsite dose points are shielded from a direct view of components containing $^{16}N$, but there can be skyshine radiation at offsite locations due to scattering of gamma rays off the mass of air above the steamlines and turbine.

The offsite dose rate due to skyshine has been found to have the following dependencies:

- The dose rate decreases as distance from the station increases.
- The dose rate increases non-linearly as the power production level increases.
- The dose rate increases when hydrogen is added to the reactor coolant, an action taken to improve reactor coolant chemistry characteristics (see Reference 39).

To calculate offsite dose due to skyshine in a given time period due to skyshine, LaSalle Station must track the following parameters:

- The total gross energy $E_h$ produced with hydrogen being added.
- The total gross energy $E_o$ produced without hydrogen being added.

The turbines at the site are sufficiently close to each other that energy generated by the two operating units at may be summed.

An initial estimate of skyshine dose is calculated per the following equation:

$$D^{Sky} = (K)(E_o + M_h E_h) \Sigma \{OF_K \; SF_K \; e^{-0.007 R_K}\} \quad (5\text{-}1)$$

The summation is over all locations **k** occupied by a hypothetical maximally exposed member of the public characterized by the parameters specified in ODCM Table 4-8. The parameters in Equation 5-1 are defined as follows:

| | | |
|---|---|---|
| $D^{Ssky}$ | Dose Due to N-16 Skyshine | [mrem] |
| | Gamma External direct gamma dose (deep dose equivalent) due to BWR N-16 skyshine for the time period of interest. | |
| K | Empirical Constant | [mrem/(MWe-hr)] |
| | A constant determined by fitting data measured at the each station. | |
| $E_o$ | Electrical Energy Generated Without Hydrogen Addition | [MWe-hr] |
| | Total gross electrical energy generated without hydrogen addition in the time period of interest. | |
| $E_h$ | Electrical Energy Generated with Hydrogen Addition | [MWe-hr] |
| | Total gross electrical energy generated with hydrogen addition in the period of interest. | |
| $M_h$ | Multiplication Factor for Hydrogen Addition | [dimensionless] |
| | Factor applied to offsite dose rate when skyshine is present. Hydrogen addition increases main steam line radiation levels typically up to a factor of approximately 5 (see Page 8-1 of Reference 39). $M_h$ is station specific and is given in ODCM Table 4-8. | |
| $OF_k$ | Occupancy Factor | [dimensionless] |

The fraction of time that the dose recipient spends at location **k** during the period of interest. See ODCM Table 4-8.

**$SF_k$** Shielding Factor [dimensionless]

A dimensionless factor that accounts for shielding due to occupancy of structures.

$SF_k$ = 0.7 if there is a structure at location **k**;

$SF_k$ = 1.0 otherwise. See ODCM Table 4-8.

**0.007** Empirical Constant [$m^{-1}$]

A constant determined by fitting data measured at the LaSalle station (see Reference 45).

**$R_k$** Distance [m]

Distance from the turbine to location **k**. See ODCM Table 4-8.

## 5.3 Onsite Radwaste and Rad Material Storage Facilities

### 5.3.1 Process Waste Storage Facilities

- Interim Radwaste Storage Facility (IRSF) structure
- Concrete vaults containing radwaste liners

### 5.3.2 DAW Storage Facilities

- Dry Active Waste (DAW) facilities (may include Butler buildings/warehouses)
- Seavans or other temporary warehouses

### 5.3.3 ISFSI Facilities

- Independent spent fuel storage installation facilities.

## 5.4 Methodology

The external total body dose is comprised of the following parts:

1) Total body dose due to noble gas radionuclides in gaseous effluents (Section 4.2.1.1),
2) Dose due to $^{16}N$ skyshine (section 0) and other contained sources (section 5.3) and
3) Total body dose due to radioactivity deposited on the ground (Section 4.2.3.1).

The external total body dose due to radioactivity deposited on the ground is accounted for in the determination of the non-noble gas dose and is considered in section 5.5.

The total external total body dose, $D^{Ex}$, is given by:

$$D^{Ex} = D^{TB} + D^{Sky} + D^{OSF} \quad (5\text{-}2)$$

| | | |
|---|---|---|
| $D^{Ex}$ | Total External Total Body Dose | [mrem] |
| | Total external total body dose due to irradiation by external sources at the location of interest. | |
| $D^{TB}$ | Noble Gas Total Body Dose | [mrem] |
| | External total body dose due to gamma radiation from noble gas radionuclides released in gaseous effluents at the location of interest. See Section 4.2.2.3. | |
| $D^{Sky}$ | Dose Due to N-16 Skyshine Total Body Dose | [mrem] |
| | External total body dose due to N-16 skyshine for the period and location of interest. See Equation 5-1. | |
| $D^{OSF}$ | Dose From On-Site Storage Facilities | [mrem] |
| | External total body dose due to gamma radiation from on-site storage facilities at the location of interest. See Section 5.3. | |

## 5.5 Total Dose

The total dose, $D^{Tot}$, in the unrestricted area to a member of the public due to plant operations is given by:

$$D^{Tot} = D^{Ex} + D_{a|}^{Liq} + D_{a|}^{NNG} \quad (5\text{-}3)$$

where:

| | | |
|---|---|---|
| $D^{Tot}$ | Total Dose To Member of Public | [mrem] |
| | Total off-site dose to a member of public due to plant operations. | |
| $D^{Ex}$ | Total External Total Body Dose | [mrem] |

Total body dose due to external exposure to noble gases, N-16 skyshine and on-site storage facilities.

$D_{aj}^{Liq}$ Liquid Effluent Dose [mrem]

Dose due to liquid effluents to age group **a** and organ **j**. The age group and organ with the highest dose from liquid effluents is used.

$D_{aj}^{NNG}$ Non-Noble Gaseous Effluent Dose [mrem]

Dose due to non-noble gaseous effluents to age group **a** and organ **j**. The age group and organ with the highest dose from non-noble gas effluents is used.

## 5.6 COMPLIANCE TO TOTAL DOSE LIMITS

### 5.6.1 Total Effective Dose Equivalent Limit - 10CFR20 Compliance

Each station's RECS limits the Total Effective Dose Equivalent (TEDE) to an annual limit of 100 mrem, as required by 10CFR20.1301 (a)(1). Demonstration of compliance with the limits of 40CFR190 (per Section 4.2.2) will be considered to demonstrate compliance with the 100 mrem/year limit.

### 5.6.2 Dose to a MEMBER OF THE PUBLIC in the Unrestricted Area

The NRC has stated that demonstration of compliance with the limits of 40CFR190 or with the design objectives of Appendix I to 10CFR50 will be deemed to demonstrate compliance with the limits of 10CFR20.1301(a)(1). Power reactors that comply with Appendix I may also have to demonstrate that they are within the 25 mrem limit of 40CFR190 (See Reference 104).

### 5.6.3 Dose to a MEMBER OF THE PUBLIC in the Restricted Area

In August of 1995, a revision to 10CFR20 was implemented that changed the definition of a member of the public. As a result, for each nuclear station, estimated doses were calculated for a member of the public who enters the site boundary, but is not authorized for unescorted access to the protected area of the site and does not enter any radiologically posted areas on the site.

Realistic assumptions were made for occupancy times and locations visited while within the site boundary.

These evaluations indicate that the doses estimated for these members of the public are well within the 10CFR20 limits.

Evaluation of the 40CFR190 dose is used to demonstrate compliance to 10CFR20 and satisfy station RECS and Technical Specifications (see ODCM Part I).

### 5.6.4 Total Dose due to the Uranium Fuel Cycle (40CFR190)

RECS and 40CFR190 limit the annual (calendar year) dose or dose commitment to any member of the public due to releases of radioactivity and to radiation from uranium fuel cycle sources to the following:

- Less than or equal to 25 mrem to the total body.
- Less than or equal to 25 mrem to any organ except the thyroid.
- Less than or equal to 75 mrem to the thyroid.

Total Dose Components

This requirement includes the total dose from operations at the nuclear power station. This includes doses due to radioactive effluents (airborne and liquid) and dose due to direct radiation from non-effluent sources (e.g., sources contained in systems on site). It also includes dose due to plants under consideration, neighboring plants and dose due to other facilities in the uranium fuel cycle.

The operations comprising the uranium fuel cycle are specified in 40CFR190.02(b). The following are included to the extent that they directly support the production of electrical power for public use utilizing nuclear energy:

- Milling of uranium ore.
- Chemical conversion of uranium.
- Isotopic enrichment of uranium.
- Fabrication of uranium fuel.
- Generation of electricity by a light-watered-cooled nuclear power plant using uranium fuel.
- Reprocessing of spent uranium fuel.

Excluded are:

- Mining operations.
- Operations at waste disposal sites.
- Transportation of any radioactive material in support of these operations.
- The re-use of recovered non-uranium special nuclear and by-product materials from the cycle.

## 5.7 When Compliance Assessment is Required

Compliance with the 40CFR190 regulations is now required as part of demonstration of compliance to 10CFR20 regulations per 10CFR20.1301(d).

The dose due to the uranium fuel cycle is determined by equation 5-3

# 6.0 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

The Radiological Environmental Monitoring Program for the environs around LaSalle Station is given in Table 6-1.

Figure 6-1 through Figure 6-3 show sampling and monitoring locations.

Table 6-1 (Page 1 of 7)
Radiological Environmental Monitoring Program

| Exposure Pathway and/or Sample | Sample or Monitoring Location | Sampling or Collection Frequency | Type and Frequency of Analysis |
|---|---|---|---|
| 1. Airborne<br><br>a. Radioiodine and Particulates | 1). Indicators-Near Field<br><br>L-01, Nearsite No. 1, 1.5 mi (2.4 km) NNW (N 41° 16.016', W 88° 40.920')<br>L-03, Onsite No. 3, 1.0 mi (1.6 km) ENE (N 41° 15.145', W 88° 39.174')<br>L-05, Onsite No. 5, 0.3 mi (0.5 km) ESE (N 41° 14.520', W 88° 39.355')<br>L-06, Nearsite No. 6, 0.4 mi (0.6 km) W (N 41° 14.602', W 88° 41.056')<br><br>2. Indicators-Far Field<br><br>L-04, Rte 170, 3.2 mi (5.1 km) E (N 41° 15.243', W 88° 36.451')<br>L-07, Seneca, 5.2 mi (8.4 km ) NNE (N 41° 19.093', W 88° 36.473')<br>L-08, Marseilles, 6.0 mi (9.7 km) NNW (N 41° 19.645', W 88° 42.925')<br>L-11, Ransom, 6.0 mi (9.7 km) S (N 41° 09.405', W 88° 39.533)<br><br>3. Controls<br><br>L-10, Streator, 13.5 mi (21.7 km) SW (N 41° 06.642', W 88° 49.481') | Continuous sampler operation with particulate sample collection weekly, or more frequently if required by dust loading, and radioiodine canister collection biweekly. | Radioiodine Canisters:<br><br>I-131 analysis biweekly on near field and control samples[1].<br><br>Particulate Sampler:<br><br>Gross beta analysis following weekly filter change[2] and gamma isotopic analysis[3] quarterly on composite filters by location on near field and control samples.[1] |

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Table 6-1 (Page 2 of 7)
Radiological Environmental Monitoring Program

| Exposure Pathway and/or Sample | Sample or Monitoring Location | Sampling or Collection Frequency | Type and Frequency of Analysis |
|---|---|---|---|
| 2. Direct Radiation<br>a. Field Dosimeter | 1) Indicators-Inner Ring<br>L-101-1, 0.5 mi (0.8 km) N (N 41° 15.084', W 88°40.087')<br>L-101-2, 0.5 mi (0.8 km) N (N 41° 15.084', W 88°40.087')<br>L-102-1, 0.6 mi (1.0 km) NNE (N 41° 15.226', W 88°39.915'<br>L-102-2, 0.6 mi (1.0 km) NNE (N 41° 15.226', W 88°39.915'<br>L-103-1, 0.7 mi (1.1 km) NE (N 41° 15.168', W 88°39.492')<br>L-103-2, 0.7 mi (1.1 km) NE (N 41° 15.168', W 88°39.492')<br>L-104-1, 0.8 mi (1.3 km) ENE (N 41° 15.138', W 88°39.185')<br>L-104-2, 0.8 mi (1.3 km) ENE (N 41° 15.138', W 88°39.185')<br>L-105-1, 0.7 mi (1.1 km) E (N 41° 14.724', W 88°39.425')<br>L-105-2, 0.7 mi (1.1 km) E (N 41° 14.724', W 88°39.425')<br>L-106-1, 1.4 mi (2.2 km) ESE (N 41° 14.328', W 88°38.751')<br>L-106-2, 1.4 mi (2.2 km) ESE (N 41° 14.328', W 88°38.751')<br>L-107-1, 0.8 mi (1.3 km) SE (N 41° 14.308', W 88°39.502')<br>L-107-2, 0.8 mi (1.3 km) SE (N 41° 14.308', W 88°39.502')<br>L-108-1, 0.5 mi (0.8 km) SSE (N 41° 14.305', W 88°39.825')<br>L-108-2, 0.5 mi (0.8 km) SSE (N 41° 14.305', W 88°39.825')<br>L-109-1, 0.6 mi (1.0 km) S (N 41° 14.299', W 88°40.106')<br>L-109-2, 0.6 mi (1.0 km) S (N 41° 14.299', W 88°40.106')<br>L-110-1, 0.6 mi (1.0 km) SSW (N 41° 14.290', W 88°40.388')<br>L-110-2, 0.6 mi (1.0 km) SSW (N 41° 14.290', W 88°40.388')<br>L-111b-1, 0.8 mi (1.3 km) SW (N 41° 14.277', W 88°40.878')<br>L-111b-2, 0.8 mi (1.3 km) SW (N 41° 14.277', W 88°40.878')<br>L-112-1, 0.9 mi (1.4 km) WSW (N 41° 14.403', W 88°41.050')<br>L-112-2, 0.9 mi (1.4 km) WSW (N 41° 14.403', W 88°41.050')<br>L-113a-1, 0.8 mi (1.3 km) W (N 41° 14.658', W 88°41.055')<br>L-113a-2, 0.8 mi (1.3 km) W (N 41° 14.658', W 88°41.055')<br>L-114-1, 0.9 mi (1.4 km) WNW (N 41° 14.991', W 88°41.070')<br>L-114-2, 0.9 mi (1.4 km) WNW (N 41° 14.991', W 88°41.070')<br>L-115-1, 0.7 mi (1.1 km) NW (N 41° 15.054', W 88°40.529')<br>L-115-2, 0.7 mi (1.1 km) NW (N 41° 15.054', W 88°40.529')<br>L-116-1, 0.6 mi (1.0 km) NNW (N 41° 15.210', W 88°40.366')<br>L-116-2, 0.6 mi (1.0 km) NNW (N 41° 15.210', W 88°40.366') | Quarterly | Gamma dose on each Field Dosimeter quarterly. |

Table 6-1 (Page 3 of 7)
Radiological Environmental Monitoring Program

| Exposure Pathway and/or Sample | Sample or Monitoring Location | Sampling or Collection Frequency | Type and Frequency of Analysis |
|---|---|---|---|
| 2. Direct Radiation (Cont'd)<br>a. Field Dosimeter | 2) Indicators-Outer Ring<br>L-201-3, 4.0 mi (6.4 km) N (N 41° 18.205', W 88°40.162')<br>L-201-4, 4.0 mi (6.4 km) N (N 41° 18.205', W 88°40.162')<br>L-202-3, 3.6 mi (5.8 km) NNE (N 41° 17.793', W 88°38.287')<br>L-202-4, 3.6 mi (5.8 km) NNE (N 41° 17.793', W 88°38.287')<br>L-203-1, 4.0 mi (6.4 km) NE (N 41° 17.291', W 88°36.311')<br>L-203-2, 4.0 mi (6.4 km) NE (N 41° 17.291', W 88°36.311')<br>L-204-1, 3.2 mi (5.2 km) ENE (N 41° 15.346', W 88°36.442')<br>L-204-2, 3.2 mi (5.2 km) ENE (N 41° 15.346', W 88°36.442')<br>L-205-1, 3.2 mi (5.2 km) ESE (N 41° 14.144', W 88°36.410')<br>L-205-2, 3.2 mi (5.2 km) ESE (N 41° 14.144', W 88°36.410')<br>L-205-3, 5.1 mi (8.2 km) E (N 41° 14.774', W 88°34.209')<br>L-205-4, 5.1 mi (8.2 km) E (N 41° 14.774', W 88°34.209')<br>L-206-1, 4.3 mi (6.9 km) SE (N 41° 12.825', W 88°36.388')<br>L-206-2, 4.3 mi (6.9 km) SE (N 41° 12.825', W 88°36.388')<br>L-207-1, 4.5 mi (7.2 km) SSE (N 41° 11.476', W 88°37.546')<br>L-207-2, 4.5 mi (7.2 km) SSE (N 41° 11.476', W 88°37.546')<br>L-208-1, 4.5 mi (7.2 km) S (N 41° 10.818', W 88°39.432')<br>L-208-2, 4.5 mi (7.2 km) S (N 41° 10.818', W 88°39.432')<br>L-209-1, 4.0 mi (6.4 km) SSW (N 41° 11.662', W 88°41.173')<br>L-209-2, 4.0 mi (6.4 km) SSW (N 41° 11.662', W 88°41.173')<br>L-210-1, 3.3 mi (5.3 km) SW (N 41° 12.519', W 88°42.364')<br>L-210-2, 3.3 mi (5.3 km) SW (N 41° 12.519', W 88°42.364')<br>L-211-1, 4.5 mi (7.2 km) WSW (N 41° 12.557', W 88°44.489')<br>L-211-2, 4.5 mi (7.2 km) WSW (N 41° 12.557', W 88°44.489')<br>L-212-1, 4.0 mi (6.4 km) W(N 41° 14.095', W 88°44.508')<br>L-212-2, 4.0 mi (6.4 km) W (N 41° 14.095', W 88°44.508')<br>L-213-3, 4.9 mi (7.9 km) W (N 41° 14.402', W 88°45.674')<br>L-213-4, 4.9 mi (7.9 km) W (N 41° 14.402', W 88°45.674')<br>L-214-3, 5.1 mi (8.2 km) WNW (N 41° 16.028', W 88°45.708')<br>L-214-4, 5.1 mi (8.2 km) WNW (N 41° 16.028', W 88°45.708')<br>L-215-3, 5.0 mi (8.0 km) NW (N 41° 17.760', W 88°44.133')<br>L-215-4, 5.0 mi (8.0 km) NW (N 41° 17.760', W 88°44.133')<br>L-216-3, 5.0 mi (8.0 km) NNW (N 41° 18.823', W 88°42.087')<br>L-216-4, 5.0 mi (8.0 km)NNW (N 41° 18.823', W 88°42.087') | Quarterly | Gamma dose on each Field Dosimeter quarterly. |

Table 6-1 (Page 4 of 7)
Radiological Environmental Monitoring Program

| Exposure Pathway and/or Sample | Sample or Monitoring Location | Sampling or Collection Frequency | Type and Frequency of Analysis |
|---|---|---|---|
| 2. Direct Radiation (Cont'd)<br>a. Field Dosimeter | 3) Indicators - Other<br><br>One at each of the airborne location given in part 1.a.1 and 1.a.2<br><br>4). Controls<br><br>One at each airborne control location given in part 1.a.3 | | |

## Table 6-1 (Page 5 of 7)
## Radiological Environmental Monitoring Program

| Exposure Pathway and/or Sample | Sample or Monitoring Location | Sampling or Collection Frequency | Type and Frequency of Analysis |
|---|---|---|---|
| 3. Waterborne | | | |
| a. Ground/Well | 1) Indicators<br>L-27, LSCS Onsite Well at Station (N 41° 14.665', W 88° 40.127')<br>L-28 #6, Marseilles Well, 4.1 mi (11.3 km ) N (N 41° 18.215', W 88° 39.430') | Quarterly | Gamma isotopic[3] and tritium analysis quarterly. |
| | 2) Control<br>L-28 #4, Marseilles Well, 7.0 mi (10.9 km) NNW (N 41° 20.367', W 88° 42.054')<br>L-28 #5, Marseilles Well, 6.7 mi (10.km) NNW (N 41° 20.142', W 88° 42.563') | | Alternate based on availability |
| b. Drinking Water | There is no drinking water pathway within 6.2 mi (10 km) downstream of station. | | |
| c. Surface Water | 1) Indicator<br>L-40, Illinois River downstream, 5.2 mi (8.4 km) NNW (N 41° 19.230', W 88° 42.048') | Weekly grab sample | Gross beta and gamma isotopic analysis[3] on monthly composite; tritium analysis on quarterly composite. |
| | 2) Control<br>L-21, Illinois River at Seneca, 4.0 mi (6.4 km) NE (N 41°17.892', W 88° 36.308') | | |
| d. Sediments | 1) Indicators<br>L-40, Illinois River downstream, 5.2 mi (8.4 km) NNW (N 41° 19.230', W 88° 42.048')<br>L-41, Illinois River downstream 4.6 mi (7.4 km) N (N 41° 18.678', W 88° 40.368') | Semiannually | Gamma isotopic analysis[3] semiannually. |
| | 2) Control<br>L-21, Illinois River at Seneca 4.0 mi (6.4 km) NE (N 41° 17.892', W 88° 36.308') | | |

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## Table 6-1 (Page 6 of 7)
## Radiological Environmental Monitoring Program

| Exposure Pathway and/or Sample | Sample or Monitoring Location | Sampling or Collection Frequency | Type and Frequency of Analysis |
|---|---|---|---|
| 4. Ingestion | 1) Indicators | | |
| a. Milk | At the time of this revision, there are no dairies within 6.2 miles which consistently produce milk.<br>2) Controls<br>L-42, Biros Dairy, 14.2 mi (22.9 km)E (N 41° 15.379', W 88° 23.823') | Biweekly: May through October; monthly: November through April | Gamma isotopic[3] and I-131 analysis[4] biweekly May through October, monthly November through April. |
| b. Fish | 1) Indicator<br>L-35, Marseilles Pool of Illinois River, 6.5 mi (10.5 km)NNW (N 41° 19.386', W 88° 42.492')<br>L-34, LaSalle Lake 2 mi (3.2 km) E<br>2) Control<br>L-36, Illinois River upstream of discharge, 4.3 mi (6.9 km) NE (N 41° 17.892', W 88° 36.308') | Two times annually | Gamma isotopic analysis[3] on edible portions of each |
| c. Food Products | a. Indicators<br>Two samples from each of the four major quadrants within 6.2 miles of the station, if available.<br>Sample locations for food products may vary based on availability and therefore are not required to be identified here but shall be taken. Refer to most recent Land Use Census for specific garden locations.<br>b. Controls<br>Two samples within 9.3 to 18.6 miles of the station, if available. Refer to most recent Land Use Census for specific garden locations. | Annually | Gamma isotopic analysis[3] and I-131 analysis each sample. |

## Table 6-1 (Page 7 of 7)
## Radiological Environmental Monitoring Program

[1] Far field samples are analyzed when near field results are inconsistent with previous measurements and radioactivity is confirmed as having its origin in airborne effluents released from the station, or at the discretion of the ODCM Specialist.

[2] Airborne particulate sample filters shall be analyzed for gross beta radioactivity 24 hours or more after sampling to allow for radon and thorium daughter decay. If gross beta activity in air particulate samples is greater than 10 times the yearly mean of control samples, gamma isotopic analysis shall be performed on the individual samples.

[3] Gamma isotopic analysis means the identification and quantification of gamma emitting radionuclides that may be attributable to the effluents from the station.

[4] I-131 analysis means the analytical separation and counting procedure are specific for this radionuclide.

Figure 6-1
Fixed Air Sampling Sites and Outer Ring Field Dosimeter Locations

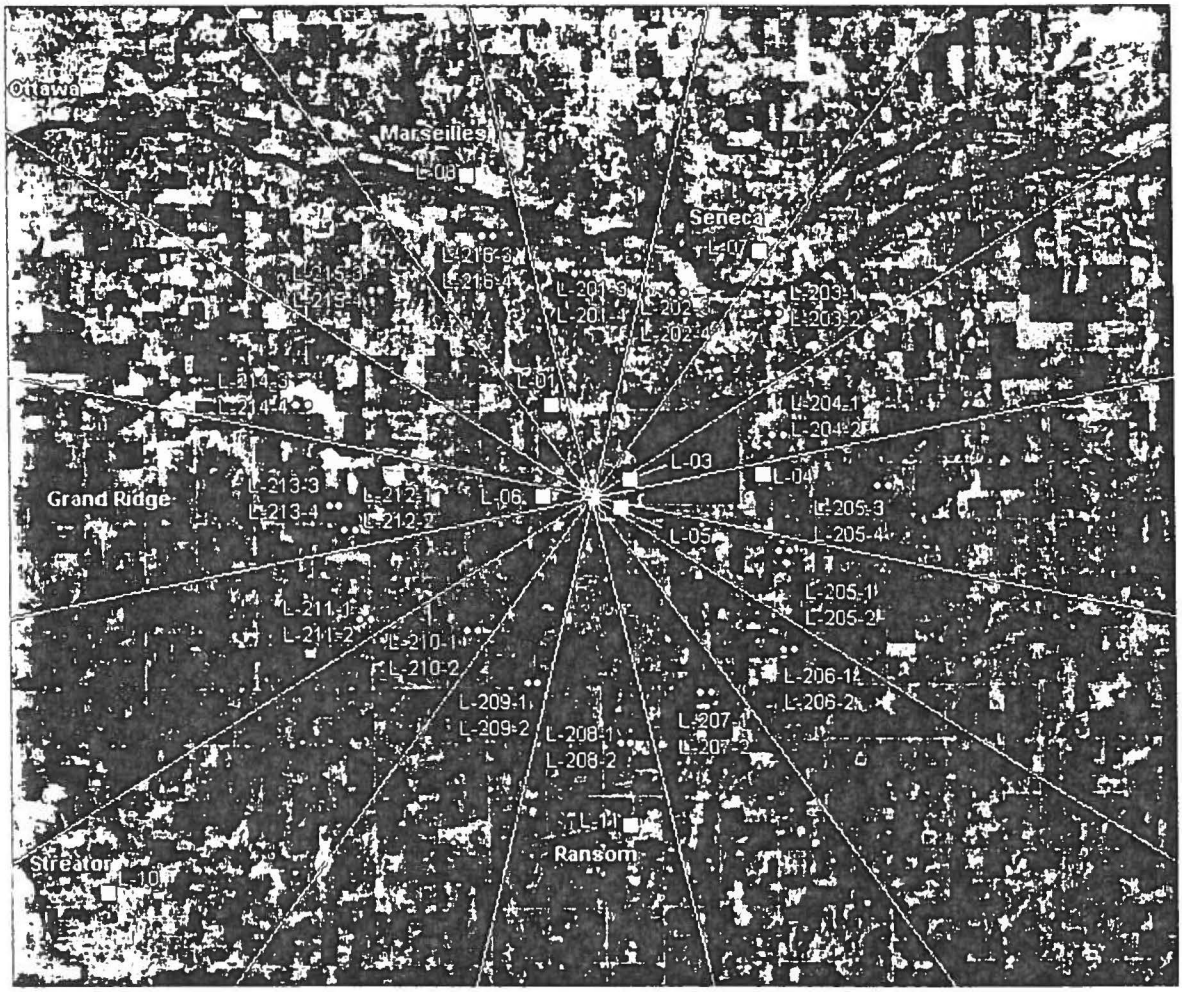

Figure 6-2
Inner Ring Field Dosimeters Locations

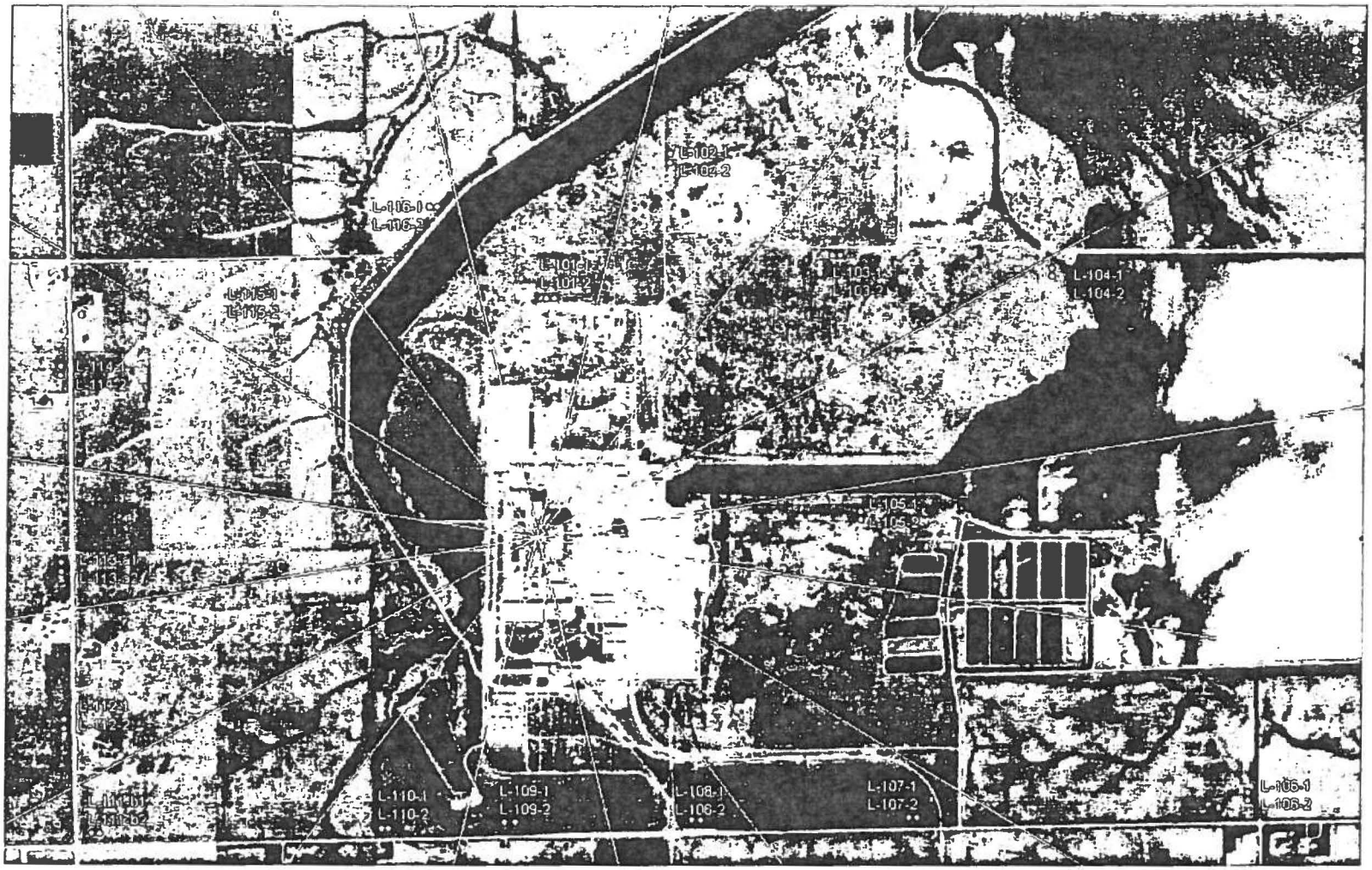

Figure 6-3
Ingestion and Waterborne Exposure Pathway Sample Locations