

# LEAFY VEGETABLE PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, R<sub>i</sub>

R<sub>i</sub> factors for Teen age group by nuclide.

Waterford Steam Electric Station

Pathway : Gaseous Release Leafy/Produce Vegetation Pathway R<sub>i</sub>

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Np-238	1.36e+04	3.63e+02	2.11e+02	0.00e+00	1.24e+03	0.00e+00	2.66e+07
Np-239	1.38e+03	1.31e+02	7.25e+01	0.00e+00	4.10e+02	0.00e+00	2.10e+07
Pu-238	6.08e+10	7.79e+09	1.65e+09	0.00e+00	7.08e+09	0.00e+00	7.01e+09
Pu-239	6.95e+10	8.44e+09	1.83e+09	0.00e+00	7.79e+09	0.00e+00	6.42e+09
Pu-240	6.94e+10	8.42e+09	1.83e+09	0.00e+00	7.78e+09	0.00e+00	6.53e+09
Pu-241	1.58e+09	7.56e+07	3.32e+07	0.00e+00	1.54e+08	0.00e+00	1.33e+08
Pu-242	6.44e+10	8.13e+09	1.76e+09	0.00e+00	7.50e+09	0.00e+00	6.29e+09
Pu-244	7.53e+10	9.27e+09	2.02e+09	0.00e+00	8.59e+09	0.00e+00	9.36e+09
Am-241	7.02e+10	6.62e+10	5.06e+09	0.00e+00	3.79e+10	0.00e+00	6.92e+09
Am-242m	7.33e+10	6.46e+10	5.27e+09	0.00e+00	3.90e+10	0.00e+00	8.99e+09
Am-243	7.23e+10	6.68e+10	5.11e+09	0.00e+00	3.84e+10	0.00e+00	8.39e+09
Cm-242	1.95e+09	2.06e+09	1.29e+08	0.00e+00	5.90e+08	0.00e+00	5.57e+09
Cm-243	5.88e+10	5.45e+10	3.70e+09	0.00e+00	1.73e+10	0.00e+00	7.49e+09
Cm-244	4.54e+10	4.30e+10	2.88e+09	0.00e+00	1.34e+10	0.00e+00	7.21e+09
Cm-245	9.00e+10	7.92e+10	5.54e+09	0.00e+00	2.59e+10	0.00e+00	6.78e+09
Cm-246	8.92e+10	7.91e+10	5.53e+09	0.00e+00	2.58e+10	0.00e+00	6.66e+09
Cm-247	8.70e+10	7.79e+10	5.45e+09	0.00e+00	2.54e+10	0.00e+00	8.75e+09
Cm-248	7.23e+11	6.42e+11	4.50e+10	0.00e+00	2.10e+11	0.00e+00	1.41e+11
Cf-252	2.98e+10	0.00e+00	7.18e+08	0.00e+00	0.00e+00	0.00e+00	2.62e+10

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

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H-3	0.00e+00	2.29e+03	2.29e+03	2.29e+03	2.29e+03	2.29e+03	2.29e+03
Be-10	9.92e+08	1.15e+08	2.49e+07	0.00e+00	8.16e+07	0.00e+00	2.02e+09
C-14	8.89e+08	1.78e+08	1.78e+08	1.78e+08	1.78e+08	1.78e+08	1.78e+08
N-13	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
F-18	6.90e+00	0.00e+00	6.84e-01	0.00e+00	0.00e+00	0.00e+00	1.87e+00
Na-22	4.09e+09	4.09e+09	4.09e+09	4.09e+09	4.09e+09	4.09e+09	4.09e+09
Na-24	3.71e+05	3.71e+05	3.71e+05	3.71e+05	3.71e+05	3.71e+05	3.71e+05
P-32	3.37e+09	1.58e+08	1.30e+08	0.00e+00	0.00e+00	0.00e+00	9.30e+07
Ca-41	2.55e+10	0.00e+00	2.79e+09	0.00e+00	0.00e+00	0.00e+00	1.40e+07
Sc-46	7.85e+05	1.08e+06	4.14e+05	0.00e+00	9.52e+05	0.00e+00	1.57e+09
Cr-51	0.00e+00	0.00e+00	1.17e+05	6.50e+04	1.78e+04	1.19e+05	6.21e+06
Mn-54	0.00e+00	6.65e+08	1.77e+08	0.00e+00	1.86e+08	0.00e+00	5.58e+08
Mn-56	0.00e+00	1.81e+01	4.08e+00	0.00e+00	2.19e+01	0.00e+00	2.62e+03
Fe-55	8.01e+08	4.25e+08	1.32e+08	0.00e+00	0.00e+00	2.40e+08	7.87e+07
Fe-59	3.97e+08	6.43e+08	3.20e+08	0.00e+00	0.00e+00	1.86e+08	6.69e+08
Co-57	0.00e+00	2.98e+07	6.04e+07	0.00e+00	0.00e+00	0.00e+00	2.44e+08
Co-58	0.00e+00	6.44e+07	1.97e+08	0.00e+00	0.00e+00	0.00e+00	3.75e+08
Co-60	0.00e+00	3.78e+08	1.12e+09	0.00e+00	0.00e+00	0.00e+00	2.10e+09
Ni-59	2.95e+09	7.86e+08	5.01e+08	0.00e+00	0.00e+00	0.00e+00	5.22e+07
Ni-63	3.95e+10	2.11e+09	1.34e+09	0.00e+00	0.00e+00	0.00e+00	1.42e+08
Ni-65	1.02e+02	9.59e+00	5.60e+00	0.00e+00	0.00e+00	0.00e+00	1.17e+03
Cu-64	0.00e+00	1.09e+04	6.60e+03	0.00e+00	2.64e+04	0.00e+00	5.13e+05
Zn-65	8.12e+08	2.16e+09	1.35e+09	0.00e+00	1.36e+09	0.00e+00	3.80e+08
Zn-69	8.73e-06	1.26e-05	1.17e-06	0.00e+00	7.66e-06	0.00e+00	7.96e-04
Zn-69m	3.81e+04	6.49e+04	7.67e+03	0.00e+00	3.77e+04	0.00e+00	2.11e+06
Se-79	0.00e+00	6.20e+08	1.37e+08	0.00e+00	1.01e+09	0.00e+00	4.06e+07
Br-82	0.00e+00	0.00e+00	2.03e+06	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Br-83	0.00e+00	0.00e+00	5.20e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Br-84	0.00e+00	0.00e+00	3.30e-11	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

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	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Rb-86	0.00e+00	4.52e+08	2.78e+08	0.00e+00	0.00e+00	0.00e+00	2.90e+07
Rb-87	0.00e+00	2.90e+09	1.35e+09	0.00e+00	0.00e+00	0.00e+00	4.35e+07
Rb-88	0.00e+00	3.37e-22	2.34e-22	0.00e+00	0.00e+00	0.00e+00	1.65e-23
Rb-89	0.00e+00	3.42e-26	3.04e-26	0.00e+00	0.00e+00	0.00e+00	2.98e-28
Sr-89	3.59e+10	0.00e+00	1.03e+09	0.00e+00	0.00e+00	0.00e+00	1.39e+09
Sr-90	1.87e+12	0.00e+00	3.77e+10	0.00e+00	0.00e+00	0.00e+00	1.67e+10
Sr-91	5.20e+05	0.00e+00	1.96e+04	0.00e+00	0.00e+00	0.00e+00	1.15e+06
Sr-92	7.07e+02	0.00e+00	2.84e+01	0.00e+00	0.00e+00	0.00e+00	1.34e+04
Y-90	2.30e+04	0.00e+00	6.17e+02	0.00e+00	0.00e+00	0.00e+00	6.56e+07
Y-91	1.86e+07	0.00e+00	4.98e+05	0.00e+00	0.00e+00	0.00e+00	2.48e+09
Y-91m	8.12e-09	0.00e+00	2.95e-10	0.00e+00	0.00e+00	0.00e+00	1.59e-05
Y-92	1.55e+00	0.00e+00	4.43e-02	0.00e+00	0.00e+00	0.00e+00	4.48e+04
Y-93	2.91e+02	0.00e+00	7.98e+00	0.00e+00	0.00e+00	0.00e+00	4.34e+06
Zr-93	1.23e+07	4.59e+05	3.27e+05	0.00e+00	1.78e+06	0.00e+00	1.74e+08
Zr-95	3.86e+06	8.48e+05	7.54e+05	0.00e+00	1.21e+06	0.00e+00	8.84e+08
Zr-97	5.68e+02	8.20e+01	4.84e+01	0.00e+00	1.18e+02	0.00e+00	1.24e+07
Nb-93m	7.64e+06	1.91e+06	6.26e+05	0.00e+00	2.06e+06	0.00e+00	2.87e+08
Nb-95	4.10e+05	1.60e+05	1.14e+05	0.00e+00	1.50e+05	0.00e+00	2.95e+08
Nb-97	4.80e-06	8.68e-07	4.05e-07	0.00e+00	9.63e-07	0.00e+00	2.68e-01
Mo-93	0.00e+00	1.77e+09	6.36e+07	0.00e+00	4.67e+08	0.00e+00	8.97e+07
Mo-99	0.00e+00	7.70e+06	1.91e+06	0.00e+00	1.64e+07	0.00e+00	6.37e+06
Tc-101	1.02e-30	1.06e-30	1.35e-29	0.00e+00	1.81e-29	5.62e-31	3.38e-30
Tc-99	3.93e+07	4.38e+07	1.57e+07	0.00e+00	5.16e+08	3.87e+06	4.59e+08
Tc-99m	4.65e+00	9.12e+00	1.51e+02	0.00e+00	1.32e+02	4.63e+00	5.19e+03
Ru-103	1.53e+07	0.00e+00	5.89e+06	0.00e+00	3.86e+07	0.00e+00	3.96e+08
Ru-105	9.01e+01	0.00e+00	3.27e+01	0.00e+00	7.92e+02	0.00e+00	5.88e+04
Ru-106	7.45e+08	0.00e+00	9.30e+07	0.00e+00	1.01e+09	0.00e+00	1.16e+10
Rh-105	1.38e+05	7.43e+04	6.35e+04	0.00e+00	2.96e+05	0.00e+00	4.60e+06
Pd-107	0.00e+00	3.47e+07	2.95e+06	0.00e+00	2.90e+08	0.00e+00	6.89e+07
Pd-109	0.00e+00	2.90e+04	8.69e+03	0.00e+00	1.55e+05	0.00e+00	1.71e+06

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	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Ag-110m	3.21e+07	2.17e+07	1.73e+07	0.00e+00	4.04e+07	0.00e+00	2.58e+09
Ag-111	3.78e+05	1.18e+05	7.81e+04	0.00e+00	3.57e+05	0.00e+00	7.25e+07
Cd-113m	0.00e+00	7.42e+08	3.16e+07	0.00e+00	7.64e+08	0.00e+00	1.91e+09
Cd-115m	0.00e+00	1.42e+08	6.04e+06	0.00e+00	1.05e+08	0.00e+00	1.93e+09
Sn-123	6.54e+09	8.11e+07	1.59e+08	8.60e+07	0.00e+00	0.00e+00	3.20e+09
Sn-125	7.43e+07	1.12e+06	3.33e+06	1.16e+06	0.00e+00	0.00e+00	2.30e+08
Sn-126	2.45e+10	3.05e+08	6.95e+08	8.38e+07	0.00e+00	0.00e+00	1.84e+09
Sb-124	3.52e+08	4.56e+06	1.23e+08	7.76e+05	0.00e+00	1.95e+08	2.20e+09
Sb-125	4.99e+08	3.85e+06	1.05e+08	4.62e+05	0.00e+00	2.78e+08	1.19e+09
Sb-126	1.40e+07	2.15e+05	5.04e+06	8.24e+04	0.00e+00	6.70e+06	2.83e+08
Sb-127	8.72e+05	1.35e+04	3.03e+05	9.71e+03	0.00e+00	3.78e+05	4.91e+07
Te-125m	3.50e+08	9.50e+07	4.67e+07	9.83e+07	0.00e+00	0.00e+00	3.38e+08
Te-127	9.76e+03	2.63e+03	2.09e+03	6.76e+03	2.78e+04	0.00e+00	3.81e+05
Te-127m	1.32e+09	3.56e+08	1.57e+08	3.16e+08	3.77e+09	0.00e+00	1.07e+09
Te-129	1.24e-03	3.45e-04	2.94e-04	8.82e-04	3.62e-03	0.00e+00	7.70e-02
Te-129m	8.40e+08	2.35e+08	1.30e+08	2.71e+08	2.47e+09	0.00e+00	1.03e+09
Te-131	2.14e-15	6.51e-16	6.35e-16	1.63e-15	6.46e-15	0.00e+00	1.12e-14
Te-131m	1.54e+06	5.32e+05	5.66e+05	1.09e+06	5.15e+06	0.00e+00	2.16e+07
Te-132	6.99e+06	3.10e+06	3.74e+06	4.51e+06	2.87e+07	0.00e+00	3.12e+07
Te-133m	3.48e-05	1.41e-05	1.74e-05	2.70e-05	1.34e-04	0.00e+00	1.07e-03
Te-134	5.16e-08	2.32e-08	3.10e-08	4.08e-08	2.15e-07	0.00e+00	2.36e-07
I-129	5.11e+09	3.13e+09	2.80e+09	2.05e+12	5.29e+09	0.00e+00	1.58e+08
I-130	6.12e+05	1.24e+06	6.37e+05	1.36e+08	1.85e+06	0.00e+00	5.78e+05
I-131	1.43e+08	1.44e+08	8.16e+07	4.75e+10	2.36e+08	0.00e+00	1.28e+07
I-132	8.91e+01	1.64e+02	7.53e+01	7.60e+03	2.51e+02	0.00e+00	1.93e+02
I-133	3.52e+06	4.35e+06	1.65e+06	8.08e+08	7.25e+06	0.00e+00	1.75e+06
I-134	1.42e-04	2.64e-04	1.21e-04	6.07e-03	4.03e-04	0.00e+00	1.75e-04
I-135	6.18e+04	1.11e+05	5.26e+04	9.86e+06	1.71e+05	0.00e+00	8.48e+04
Cs-134	1.60e+10	2.63e+10	5.55e+09	0.00e+00	8.15e+09	2.93e+09	1.42e+08
Cs-134m	1.06e+01	1.57e+01	1.02e+01	0.00e+00	8.26e+00	1.37e+00	1.98e+01

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Cs-135	6.10e+09	4.25e+09	4.36e+08	0.00e+00	1.50e+09	5.01e+08	3.18e+07
Cs-136	8.23e+07	2.26e+08	1.46e+08	0.00e+00	1.21e+08	1.80e+07	7.95e+06
Cs-137	2.39e+10	2.29e+10	3.38e+09	0.00e+00	7.46e+09	2.68e+09	1.43e+08
Cs-138	5.69e-11	7.91e-11	5.02e-11	0.00e+00	5.57e-11	5.99e-12	3.64e-11
Cs-139	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Ba-139	4.69e-02	2.50e-05	1.36e-03	0.00e+00	2.18e-05	1.47e-05	2.70e+00
Ba-140	2.76e+08	2.42e+05	1.61e+07	0.00e+00	7.88e+04	1.44e+05	1.40e+08
Ba-141	1.54e-21	8.64e-25	5.02e-23	0.00e+00	7.47e-25	5.07e-24	8.79e-22
Ba-142	6.46e-39	0.00e+00	3.61e-40	0.00e+00	0.00e+00	0.00e+00	0.00e+00
La-140	3.24e+03	1.13e+03	3.82e+02	0.00e+00	0.00e+00	0.00e+00	3.16e+07
La-141	1.04e+00	2.41e-01	5.24e-02	0.00e+00	0.00e+00	0.00e+00	5.37e+04
La-142	3.20e-04	1.02e-04	3.19e-05	0.00e+00	0.00e+00	0.00e+00	2.02e+01
Ce-141	6.55e+05	3.27e+05	4.85e+04	0.00e+00	1.43e+05	0.00e+00	4.08e+08
Ce-143	1.71e+03	9.29e+05	1.35e+02	0.00e+00	3.90e+02	0.00e+00	1.36e+07
Ce-144	1.27e+08	3.98e+07	6.78e+06	0.00e+00	2.21e+07	0.00e+00	1.04e+10
Pr-143	1.45e+05	4.37e+04	7.22e+03	0.00e+00	2.36e+04	0.00e+00	1.57e+08
Pr-144	4.11e-26	1.27e-26	2.07e-27	0.00e+00	6.73e-27	0.00e+00	2.74e-23
Nd-147	7.14e+04	5.78e+04	4.48e+03	0.00e+00	3.17e+04	0.00e+00	9.16e+07
Pm-147	2.21e+07	1.58e+06	8.48e+05	0.00e+00	2.79e+06	0.00e+00	6.39e+08
Pm-148	3.36e+04	4.04e+03	2.62e+03	0.00e+00	6.87e+03	0.00e+00	1.08e+08
Pm-148m	2.28e+06	4.54e+05	4.54e+05	0.00e+00	6.73e+05	0.00e+00	1.28e+09
Pm-149	2.93e+03	3.12e+02	1.69e+02	0.00e+00	5.52e+02	0.00e+00	2.13e+07
Pm-151	5.72e+02	6.96e+01	4.53e+01	0.00e+00	1.18e+02	0.00e+00	7.90e+06
Sm-151	1.88e+07	2.80e+06	8.81e+05	0.00e+00	2.89e+06	0.00e+00	4.06e+08
Sm-153	1.42e+03	8.83e+02	8.51e+01	0.00e+00	2.69e+02	0.00e+00	1.17e+07
Eu-152	4.47e+07	8.14e+06	9.66e+06	0.00e+00	3.44e+07	0.00e+00	1.34e+09
Eu-154	1.69e+08	1.52e+07	1.39e+07	0.00e+00	6.68e+07	0.00e+00	3.53e+09
Eu-155	3.27e+07	2.35e+06	1.84e+06	0.00e+00	8.82e+06	0.00e+00	5.89e+09
Eu-156	2.58e+05	1.38e+05	2.86e+04	0.00e+00	8.89e+04	0.00e+00	3.13e+08
Tb-160	6.01e+06	0.00e+00	7.46e+05	0.00e+00	1.79e+06	0.00e+00	1.33e+09

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# LEAFY VEGETABLE PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, R<sub>i</sub>

R<sub>i</sub> factors for Child age group by nuclide.

Waterford Steam Electric Station

Pathway : Gaseous Release Leafy/Produce Vegetation Pathway R<sub>i</sub>

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Ho-166m	7.94e+07	1.66e+07	1.40e+07	0.00e+00	2.37e+07	0.00e+00	1.93e+09
W-181	2.03e+06	4.98e+05	6.85e+04	0.00e+00	0.00e+00	0.00e+00	1.81e+07
W-185	6.44e+07	1.61e+07	2.25e+06	0.00e+00	0.00e+00	0.00e+00	5.99e+08
W-187	6.41e+04	3.80e+04	1.70e+04	0.00e+00	0.00e+00	0.00e+00	5.34e+06
Pb-210	3.47e+12	8.90e+11	1.53e+11	0.00e+00	2.68e+12	0.00e+00	1.68e+08
Bi-210	2.06e+06	1.07e+07	1.18e+06	0.00e+00	1.20e+08	0.00e+00	5.41e+07
Po-210	7.66e+10	1.23e+11	1.85e+10	0.00e+00	3.81e+11	0.00e+00	3.30e+09
Ra-223	5.77e+10	6.67e+07	1.15e+10	0.00e+00	1.77e+09	0.00e+00	9.20e+08
Ra-224	5.36e+09	9.73e+06	1.07e+09	0.00e+00	2.58e+08	0.00e+00	2.94e+08
Ra-225	1.22e+11	1.09e+08	2.44e+10	0.00e+00	2.89e+09	0.00e+00	1.40e+09
Ra-226	4.23e+13	1.35e+09	3.47e+13	0.00e+00	3.59e+10	0.00e+00	2.51e+10
Ra-228	2.76e+13	7.16e+08	3.10e+13	0.00e+00	1.90e+10	0.00e+00	4.16e+09
Ac-225	4.16e+07	4.29e+07	2.79e+06	0.00e+00	4.58e+06	0.00e+00	9.54e+08
Ac-227	3.01e+11	4.84e+10	1.86e+10	0.00e+00	1.07e+10	0.00e+00	6.16e+09
Th-227	3.88e+08	5.28e+06	1.12e+07	0.00e+00	2.80e+07	0.00e+00	3.73e+09
Th-228	1.41e+11	1.81e+09	4.77e+09	0.00e+00	9.40e+09	0.00e+00	3.95e+10
Th-229	1.73e+12	4.34e+10	2.88e+10	0.00e+00	2.12e+11	0.00e+00	5.91e+09
Th-230	2.61e+11	1.31e+10	7.28e+09	0.00e+00	6.37e+10	0.00e+00	4.55e+09
Th-232	2.91e+11	1.12e+10	2.21e+08	0.00e+00	5.45e+10	0.00e+00	3.87e+09
Th-234	3.61e+06	1.59e+05	1.04e+05	0.00e+00	8.46e+05	0.00e+00	1.25e+09
Pa-231	5.20e+11	1.72e+10	2.07e+10	0.00e+00	9.41e+10	0.00e+00	5.42e+09
Pa-233	2.34e+05	3.65e+04	4.09e+04	0.00e+00	1.34e+05	0.00e+00	1.86e+08
U-232	1.29e+12	0.00e+00	9.24e+10	0.00e+00	9.83e+10	0.00e+00	5.12e+09
U-233	2.73e+11	0.00e+00	1.65e+10	0.00e+00	4.48e+10	0.00e+00	4.74e+09
U-234	2.62e+11	0.00e+00	1.62e+10	0.00e+00	4.40e+10	0.00e+00	4.65e+09
U-235	2.51e+11	0.00e+00	1.52e+10	0.00e+00	4.12e+10	0.00e+00	5.90e+09
U-236	2.51e+11	0.00e+00	1.56e+10	0.00e+00	4.21e+10	0.00e+00	4.35e+09
U-237	3.26e+05	0.00e+00	8.65e+04	0.00e+00	9.39e+05	0.00e+00	2.87e+07
U-238	2.40e+11	0.00e+00	1.43e+10	0.00e+00	3.85e+10	0.00e+00	4.16e+09
Np-237	1.64e+11	1.08e+10	7.20e+09	0.00e+00	4.45e+10	0.00e+00	6.00e+09

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# LEAFY VEGETABLE PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

$R_i$  factors for Child age group by nuclide.

Waterford Steam Electric Station

Pathway : Gaseous Release Leafy/Produce Vegetation Pathway  $R_i$

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Np-238	2.51e+04	5.08e+02	3.91e+02	0.00e+00	1.62e+03	0.00e+00	1.74e+07
Np-239	2.56e+03	1.84e+02	1.29e+02	0.00e+00	5.31e+02	0.00e+00	1.36e+07
Pu-238	8.73e+10	1.01e+10	2.32e+09	0.00e+00	8.44e+09	0.00e+00	5.50e+09
Pu-239	9.48e+10	1.01e+10	2.43e+09	0.00e+00	8.97e+09	0.00e+00	5.03e+09
Pu-240	9.41e+10	1.05e+10	2.43e+09	0.00e+00	8.97e+09	0.00e+00	5.13e+09
Pu-241	2.82e+09	1.15e+08	5.85e+07	0.00e+00	2.15e+08	0.00e+00	1.05e+08
Pu-242	8.75e+10	1.01e+10	2.34e+09	0.00e+00	8.60e+09	0.00e+00	4.93e+09
Pu-244	1.02e+11	1.16e+11	2.68e+09	0.00e+00	9.92e+09	0.00e+00	7.35e+09
Am-241	9.67e+10	8.32e+10	7.25e+09	0.00e+00	4.43e+10	0.00e+00	5.43e+09
Am-242m	1.03e+11	8.22e+10	7.64e+09	0.00e+00	4.63e+10	0.00e+00	7.06e+09
Am-243	9.85e+10	8.31e+10	7.23e+09	0.00e+00	4.45e+10	0.00e+00	6.58e+09
Cm-242	4.69e+09	3.74e+09	3.12e+08	0.00e+00	9.98e+08	0.00e+00	4.35e+09
Cm-243	9.36e+10	7.61e+10	6.03e+09	0.00e+00	2.25e+10	0.00e+00	5.87e+09
Cm-244	7.87e+10	6.37e+10	5.05e+09	0.00e+00	1.85e+10	0.00e+00	5.67e+09
Cm-245	1.23e+11	9.85e+10	7.72e+09	0.00e+00	3.02e+10	0.00e+00	5.32e+09
Cm-246	1.21e+11	9.85e+10	7.72e+09	0.00e+00	3.01e+10	0.00e+00	5.23e+09
Cm-247	1.18e+11	9.70e+10	7.57e+09	0.00e+00	2.97e+10	0.00e+00	6.87e+09
Cm-248	9.85e+11	8.01e+11	6.26e+10	0.00e+00	2.45e+11	0.00e+00	1.11e+11
Cf-252	7.28e+10	0.00e+00	1.76e+09	0.00e+00	0.00e+00	0.00e+00	2.05e+10

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# LEAFY VEGETABLE PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, R<sub>i</sub>

R<sub>i</sub> factors for Infant age group by nuclide.

Waterford Steam Electric Station

Pathway : Gaseous Release Leafy/Produce Vegetation Pathway R<sub>i</sub>

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
H-3	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Be-10	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
C-14	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
N-13	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
F-18	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Na-22	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Na-24	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
P-32	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Ca-41	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Sc-46	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Cr-51	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Mn-54	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Mn-56	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Fe-55	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Fe-59	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Co-57	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Co-58	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Co-60	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Ni-59	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Ni-63	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Ni-65	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Cu-64	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Zn-65	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Zn-69	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Zn-69m	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Se-79	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Br-82	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Br-83	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Br-84	0.00e+00	0.00e+00	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

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# LEAFY VEGETABLE PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, R<sub>i</sub>

R<sub>i</sub> factors for Infant age group by nuclide.

Waterford Steam Electric Station

Pathway : Gaseous Release Leafy/Produce Vegetation Pathway R<sub>i</sub>

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Rb-86	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Rb-87	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	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
Rb-89	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Sr-89	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Sr-90	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Sr-91	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Sr-92	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Y-90	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Y-91	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Y-91m	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Y-92	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Y-93	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Zr-93	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Zr-95	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Zr-97	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Nb-93m	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Nb-95	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Nb-97	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Mo-93	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Mo-99	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	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
Tc-99	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Tc-99m	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Ru-103	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Ru-105	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Ru-106	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Rh-105	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Pd-107	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Pd-109	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# LEAFY VEGETABLE PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, R<sub>i</sub>

R<sub>i</sub> factors for Infant age group by nuclide.

Waterford Steam Electric Station

Pathway : Gaseous Release Leafy/Produce Vegetation Pathway R<sub>i</sub>

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Ag-110m	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Ag-111	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Cd-113m	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Cd-115m	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Sn-123	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Sn-125	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Sn-126	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Sb-124	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Sb-125	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Sb-126	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Sb-127	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Te-125m	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Te-127	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Te-127m	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Te-129	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Te-129m	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	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
Te-131m	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Te-132	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Te-133m	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Te-134	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
I-129	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
I-130	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
I-131	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
I-132	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
I-133	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
I-134	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
I-135	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Cs-134	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Cs-134m	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# LEAFY VEGETABLE PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

$R_i$  factors for Infant age group by nuclide.

Waterford Steam Electric Station

Pathway : Gaseous Release Leafy/Produce Vegetation Pathway  $R_i$

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Cs-135	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Cs-136	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Cs-137	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Cs-138	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	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
Ba-139	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Ba-140	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	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
Ba-142	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
La-140	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
La-141	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
La-142	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Ce-141	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Ce-143	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Ce-144	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Pr-143	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	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
Nd-147	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Pm-147	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Pm-148	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Pm-148m	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Pm-149	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Pm-151	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Sm-151	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Sm-153	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Eu-152	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Eu-154	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Eu-155	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Eu-156	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Tb-160	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# LEAFY VEGETABLE PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, R<sub>i</sub>

R<sub>i</sub> factors for Infant age group by nuclide.

Waterford Steam Electric Station

Pathway : Gaseous Release Leafy/Produce Vegetation Pathway R<sub>i</sub>

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Ho-166m	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
W-181	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
W-185	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
W-187	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Pb-210	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Bi-210	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Po-210	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Ra-223	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Ra-224	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Ra-225	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Ra-226	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Ra-228	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Ac-225	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Ac-227	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Th-227	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Th-228	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Th-229	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Th-230	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Th-232	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Th-234	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Pa-231	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Pa-233	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
U-232	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
U-233	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
U-234	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
U-235	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
U-236	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
U-237	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
U-238	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Np-237	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.



# LEAFY VEGETABLE PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, R<sub>i</sub>

R<sub>i</sub> factors for Infant age group by nuclide.

Waterford Steam Electric Station

Pathway : Gaseous Release Leafy/Produce Vegetation Pathway R<sub>i</sub>

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LIJ
Np-238	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Np-239	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Pu-238	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Pu-239	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Pu-240	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Pu-241	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Pu-242	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Pu-244	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Am-241	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Am-242m	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Am-243	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Cm-242	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Cm-243	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Cm-244	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Cm-245	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Cm-246	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Cm-247	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Cm-248	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Cf-252	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# GOAT's MILK PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, R<sub>i</sub>

R<sub>i</sub> factors for Adult age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Gaseous Release Goat's Milk Pathway R<sub>i</sub>

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
H-3	0.00e+00	8.88e+02	8.88e+02	8.88e+02	8.88e+02	8.88e+02	8.88e+02
Be-10	2.95e+05	4.55e+04	7.36e+03	0.00e+00	3.44e+04	0.00e+00	2.49e+06
C-14	2.63e+08	5.27e+07	5.27e+07	5.27e+07	5.27e+07	5.27e+07	5.27e+07
N-13	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
F-18	5.58e-04	0.00e+00	6.19e-05	0.00e+00	0.00e+00	0.00e+00	1.65e-05
Na-22	6.35e+08	6.35e+08	6.35e+08	6.35e+08	6.35e+08	6.35e+08	6.35e+08
Na-24	2.93e+05	2.93e+05	2.93e+05	2.93e+05	2.93e+05	2.93e+05	2.93e+05
P-32	2.05e+10	1.28e+09	7.93e+08	0.00e+00	0.00e+00	0.00e+00	2.31e+09
Ca-41	1.37e+09	0.00e+00	1.48e+08	0.00e+00	0.00e+00	0.00e+00	1.37e+06
Sc-46	2.15e+01	4.18e+01	1.22e+01	0.00e+00	3.90e+01	0.00e+00	2.04e+05
Cr-51	0.00e+00	0.00e+00	3.43e+03	2.05e+03	7.55e+02	4.55e+03	8.62e+05
Mn-54	0.00e+00	1.01e+06	1.93e+05	0.00e+00	3.00e+05	0.00e+00	3.09e+06
Mn-56	0.00e+00	4.98e-04	8.84e-05	0.00e+00	6.33e-04	0.00e+00	1.59e-02
Fe-55	3.26e+05	2.26e+05	5.26e+04	0.00e+00	0.00e+00	1.26e+05	1.29e+05
Fe-59	3.86e+05	9.07e+05	3.48e+05	0.00e+00	0.00e+00	2.54e+05	3.02e+06
Co-57	0.00e+00	1.54e+05	2.55e+05	0.00e+00	0.00e+00	0.00e+00	3.89e+06
Co-58	0.00e+00	5.66e+05	1.27e+06	0.00e+00	0.00e+00	0.00e+00	1.15e+07
Co-60	0.00e+00	1.97e+06	4.34e+06	0.00e+00	0.00e+00	0.00e+00	3.70e+07
Ni-59	6.06e+07	2.08e+07	1.01e+07	0.00e+00	0.00e+00	0.00e+00	4.29e+06
Ni-63	8.07e+08	5.60e+07	2.71e+07	0.00e+00	0.00e+00	0.00e+00	1.17e+07
Ni-65	4.51e-02	5.86e-03	2.67e-03	0.00e+00	0.00e+00	0.00e+00	1.49e-01
Cu-64	0.00e+00	2.66e+03	1.25e+03	0.00e+00	6.72e+03	0.00e+00	2.27e+05
Zn-65	1.65e+08	5.24e+08	2.37e+08	0.00e+00	3.50e+08	0.00e+00	3.30e+08
Zn-69	2.62e-13	5.00e-13	3.48e-14	0.00e+00	3.25e-13	0.00e+00	7.52e-14
Zn-69m	2.18e+04	5.22e+04	4.78e+03	0.00e+00	3.16e+04	0.00e+00	3.19e+06
Se-79	0.00e+00	1.10e+08	1.83e+07	0.00e+00	1.90e+08	0.00e+00	2.25e+07
Br-82	0.00e+00	0.00e+00	3.88e+06	0.00e+00	0.00e+00	0.00e+00	4.44e+06
Br-83	0.00e+00	0.00e+00	1.18e-02	0.00e+00	0.00e+00	0.00e+00	1.71e-02
Br-84	0.00e+00	0.00e+00	2.08e-24	0.00e+00	0.00e+00	0.00e+00	1.63e-29
Br-85	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# GOAT's MILK PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, R<sub>i</sub>

Ri factors for Adult age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Gaseous Release Goat's Milk Pathway Ri

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Rb-86	0.00e+00	3.11e+08	1.45e+08	0.00e+00	0.00e+00	0.00e+00	6.14e+07
Rb-87	0.00e+00	3.42e+08	1.19e+08	0.00e+00	0.00e+00	0.00e+00	1.60e+07
Rb-88	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
Sr-89	3.05e+09	0.00e+00	8.74e+07	0.00e+00	0.00e+00	0.00e+00	4.89e+08
Sr-90	1.13e+11	0.00e+00	2.27e+09	0.00e+00	0.00e+00	0.00e+00	2.84e+09
Sr-91	6.10e+04	0.00e+00	2.46e+03	0.00e+00	0.00e+00	0.00e+00	2.90e+05
Sr-92	1.04e+00	0.00e+00	4.50e-02	0.00e+00	0.00e+00	0.00e+00	2.06e+01
Y-90	8.51e+00	0.00e+00	2.28e-01	0.00e+00	0.00e+00	0.00e+00	9.02e+04
Y-91	1.03e+03	0.00e+00	2.76e+01	0.00e+00	0.00e+00	0.00e+00	5.67e+05
Y-91m	7.52e-21	0.00e+00	2.91e-22	0.00e+00	0.00e+00	0.00e+00	2.21e-20
Y-92	6.77e-06	0.00e+00	1.98e-07	0.00e+00	0.00e+00	0.00e+00	1.19e-01
Y-93	2.69e-02	0.00e+00	7.43e-04	0.00e+00	0.00e+00	0.00e+00	8.53e+02
Zr-93	1.94e+02	1.09e+01	5.05e+00	0.00e+00	4.11e+01	0.00e+00	1.13e+04
Zr-95	1.13e+02	3.63e+01	2.46e+01	0.00e+00	5.70e+01	0.00e+00	1.15e+05
Zr-97	5.21e-02	1.05e-02	4.81e-03	0.00e+00	1.59e-02	0.00e+00	3.26e+03
Nb-93m	5.89e+04	1.92e+04	4.74e+03	0.00e+00	2.21e+04	0.00e+00	8.88e+06
Nb-95	9.91e+03	5.51e+03	2.96e+03	0.00e+00	5.45e+03	0.00e+00	3.34e+07
Nb-97	7.89e-13	2.00e-13	7.29e-14	0.00e+00	2.33e-13	0.00e+00	7.37e-10
Mo-93	0.00e+00	5.22e+07	1.41e+06	0.00e+00	1.48e+07	0.00e+00	8.49e+06
Mo-99	0.00e+00	2.97e+06	5.66e+05	0.00e+00	6.73e+06	0.00e+00	6.89e+06
Tc-101	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Tc-99	2.90e+06	4.31e+06	1.16e+06	0.00e+00	5.43e+07	3.66e+05	1.41e+08
Tc-99m	4.01e-01	1.13e+00	1.44e+01	0.00e+00	1.72e+01	5.55e-01	6.71e+02
Ru-103	1.22e+02	0.00e+00	5.26e+01	0.00e+00	4.66e+02	0.00e+00	1.43e+04
Ru-105	1.04e-04	0.00e+00	4.09e-05	0.00e+00	1.34e-03	0.00e+00	6.34e-02
Ru-106	2.45e+03	0.00e+00	3.10e+02	0.00e+00	4.73e+03	0.00e+00	1.58e+05
Rh-105	4.15e+04	3.04e+04	2.00e+04	0.00e+00	1.29e+05	0.00e+00	4.81e+06
Pd-107	0.00e+00	1.36e+06	8.72e+04	0.00e+00	1.22e+07	0.00e+00	8.45e+06
Pd-109	0.00e+00	5.39e+03	1.22e+03	0.00e+00	3.08e+04	0.00e+00	5.97e+05

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# GOAT's MILK PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, R<sub>i</sub>

R<sub>i</sub> factors for Adult age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Gaseous Release Goat's Milk Pathway R<sub>i</sub>

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Ag-110m	6.99e+06	6.46e+06	3.84e+06	0.00e+00	1.27e+07	0.00e+00	2.64e+09
Ag-111	7.77e+05	3.25e+05	1.62e+05	0.00e+00	1.05e+06	0.00e+00	5.96e+08
Cd-113m	0.00e+00	3.53e+05	1.13e+04	0.00e+00	3.88e+05	0.00e+00	2.84e+06
Cd-115m	0.00e+00	1.51e+05	4.82e+03	0.00e+00	1.20e+05	0.00e+00	6.36e+06
Sn-123	6.43e+07	1.07e+06	1.57e+06	9.06e+05	0.00e+00	0.00e+00	1.31e+08
Sn-125	6.81e+06	1.37e+05	3.09e+05	1.14e+05	0.00e+00	0.00e+00	8.50e+07
Sn-126	1.96e+08	3.87e+06	5.56e+06	1.14e+06	0.00e+00	0.00e+00	5.63e+07
Sb-124	3.09e+06	5.83e+04	1.22e+06	7.49e+03	0.00e+00	2.40e+06	8.77e+07
Sb-125	2.45e+06	2.74e+04	5.84e+05	2.49e+03	0.00e+00	1.89e+06	2.70e+07
Sb-126	6.75e+05	1.37e+04	2.44e+05	4.13e+03	0.00e+00	4.14e+05	5.52e+07
Sb-127	5.44e+04	1.19e+03	2.09e+04	6.54e+02	0.00e+00	3.23e+04	1.24e+07
Te-125m	1.95e+06	7.08e+05	2.62e+05	5.88e+05	7.95e+06	0.00e+00	7.80e+06
Te-127	7.87e+01	2.82e+01	1.70e+01	5.83e+01	3.20e+02	0.00e+00	6.21e+03
Te-127m	5.49e+06	1.96e+06	6.69e+05	1.40e+06	2.23e+07	0.00e+00	1.84e+07
Te-129	3.50e-11	1.32e-11	8.53e-12	2.69e-11	1.47e-10	0.00e+00	2.64e-11
Te-129m	7.22e+06	2.69e+06	1.14e+06	2.48e+06	3.02e+07	0.00e+00	3.64e+07
Te-131	4.74e-34	1.98e-34	1.50e-34	3.90e-34	2.08e-33	0.00e+00	6.72e-35
Te-131m	4.34e+04	2.12e+04	1.77e+04	3.36e+04	2.15e+05	0.00e+00	2.11e+06
Te-132	2.88e+05	1.86e+05	1.75e+05	2.06e+05	1.80e+06	0.00e+00	8.82e+06
Te-133m	2.63e-14	1.54e-14	1.48e-14	2.23e-14	1.52e-13	0.00e+00	5.28e-15
Te-134	1.13e-19	7.39e-20	4.53e-20	9.86e-20	7.14e-19	0.00e+00	1.25e-22
I-129	9.10e+07	7.82e+07	2.56e+08	2.01e+11	1.68e+08	0.00e+00	1.24e+07
I-130	5.06e+04	1.49e+05	5.89e+04	1.26e+07	2.33e+05	0.00e+00	1.28e+05
I-131	3.55e+07	5.08e+07	2.91e+07	1.67e+10	8.71e+07	0.00e+00	1.34e+07
I-132	2.00e-02	5.36e-02	1.88e-02	1.88e+00	8.54e-02	0.00e+00	1.01e-02
I-133	4.65e+05	8.09e+05	2.47e+05	1.19e+08	1.41e+06	0.00e+00	7.27e+05
I-134	2.53e-13	6.87e-13	2.46e-13	1.19e-11	1.09e-12	0.00e+00	5.99e-16
I-135	1.55e+03	4.06e+03	1.50e+03	2.68e+05	6.51e+03	0.00e+00	4.58e+03
Cs-134	1.70e+10	4.03e+10	3.30e+10	0.00e+00	1.31e+10	4.33e+09	7.06e+08
Cs-134m	5.28e-01	1.11e+00	5.68e-01	0.00e+00	6.02e-01	9.49e-02	3.92e-01

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# GOAT's MILK PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, R<sub>i</sub>

Ri factors for Adult age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Gaseous Release Goat's Milk Pathway Ri

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Cs-135	5.43e+09	5.01e+09	2.22e+09	0.00e+00	1.89e+09	5.68e+08	1.17e+08
Cs-136	7.90e+08	3.12e+09	2.24e+09	0.00e+00	1.73e+09	2.38e+08	3.54e+08
Cs-137	2.21e+10	3.03e+10	1.98e+10	0.00e+00	1.03e+10	3.42e+09	5.86e+08
Cs-138	2.91e-23	5.76e-23	2.85e-23	0.00e+00	4.23e-23	4.18e-24	2.46e-28
Cs-139	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Ba-139	5.45e-09	3.88e-12	1.60e-10	0.00e+00	3.63e-12	2.20e-12	9.67e-09
Ba-140	3.23e+06	4.05e+03	2.11e+05	0.00e+00	1.38e+03	2.32e+03	6.64e+06
Ba-141	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	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
La-140	5.42e-01	2.73e-01	7.22e-02	0.00e+00	0.00e+00	0.00e+00	2.00e+04
La-141	3.60e-06	1.12e-06	1.83e-07	0.00e+00	0.00e+00	0.00e+00	1.33e-01
La-142	2.28e-12	1.04e-12	2.59e-13	0.00e+00	0.00e+00	0.00e+00	7.58e-09
Ce-141	5.81e+02	3.93e+02	4.46e+01	0.00e+00	1.83e+02	0.00e+00	1.50e+06
Ce-143	4.99e+00	3.69e+03	4.09e-01	0.00e+00	1.63e+00	0.00e+00	1.38e+05
Ce-144	4.29e+04	1.79e+04	2.30e+03	0.00e+00	1.06e+04	0.00e+00	1.45e+07
Pr-143	1.89e+01	7.60e+00	9.39e-01	0.00e+00	4.39e+00	0.00e+00	8.30e+04
Pr-144	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Nd-147	1.13e+01	1.31e+01	7.81e-01	0.00e+00	7.63e+00	0.00e+00	6.27e+04
Pm-147	3.44e+02	3.24e+01	1.31e+01	0.00e+00	6.11e+01	0.00e+00	4.08e+04
Pm-148	7.12e+00	1.18e+00	5.95e-01	0.00e+00	2.23e+00	0.00e+00	9.28e+04
Pm-148m	1.03e+02	2.66e+01	2.04e+01	0.00e+00	4.02e+01	0.00e+00	2.26e+05
Pm-149	5.13e-01	7.26e-02	2.96e-02	0.00e+00	1.37e-01	0.00e+00	1.36e+04
Pm-151	7.76e-02	1.30e-02	6.58e-03	0.00e+00	2.33e-02	0.00e+00	3.58e+03
Sm-151	3.20e+02	5.52e+01	1.32e+01	0.00e+00	6.16e+01	0.00e+00	2.43e+04
Sm-153	2.39e-01	1.99e-01	1.45e-02	0.00e+00	6.43e-02	0.00e+00	7.10e+03
Eu-152	9.01e+02	2.05e+02	1.80e+02	0.00e+00	1.27e+03	0.00e+00	1.18e+05
Eu-154	2.85e+03	3.50e+02	2.49e+02	0.00e+00	1.68e+03	0.00e+00	2.54e+05
Eu-155	3.90e+02	5.53e+01	3.57e+01	0.00e+00	2.55e+02	0.00e+00	4.35e+04
Eu-156	3.02e+01	2.34e+01	3.77e+00	0.00e+00	1.56e+01	0.00e+00	1.60e+05
Tb-160	1.79e+02	0.00e+00	2.23e+01	0.00e+00	7.39e+01	0.00e+00	1.65e+05

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# GOAT's MILK PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, R<sub>i</sub>

R<sub>i</sub> factors for Adult age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Gaseous Release Goat's Milk Pathway R<sub>i</sub>

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Ho-166m	1.25e+03	3.91e+02	2.97e+02	0.00e+00	5.84e+02	0.00e+00	1.19e+05
W-181	4.07e+03	1.33e+03	1.42e+02	0.00e+00	0.00e+00	0.00e+00	1.51e+05
W-185	1.55e+05	5.18e+04	5.45e+03	0.00e+00	0.00e+00	0.00e+00	5.99e+06
W-187	7.83e+02	6.54e+02	2.29e+02	0.00e+00	0.00e+00	0.00e+00	2.14e+05
Pb-210	8.78e+09	2.51e+09	3.12e+08	0.00e+00	7.06e+09	0.00e+00	1.29e+06
Bi-210	4.27e+04	2.95e+05	2.45e+04	0.00e+00	3.55e+06	0.00e+00	4.40e+06
Po-210	8.90e+07	1.89e+08	2.15e+07	0.00e+00	6.30e+08	0.00e+00	1.59e+07
Ra-223	1.47e+10	2.26e+07	2.93e+09	0.00e+00	6.40e+08	0.00e+00	9.46e+08
Ra-224	1.70e+09	4.11e+06	3.40e+08	0.00e+00	1.16e+08	0.00e+00	3.58e+08
Ra-225	2.28e+10	2.70e+07	4.55e+09	0.00e+00	7.67e+08	0.00e+00	1.06e+09
Ra-226	2.24e+12	4.26e+07	1.63e+12	0.00e+00	1.21e+09	0.00e+00	2.46e+09
Ra-228	8.25e+11	2.30e+07	8.91e+11	0.00e+00	6.50e+08	0.00e+00	4.15e+08
Ac-225	7.40e+03	1.02e+04	4.98e+02	0.00e+00	1.16e+03	0.00e+00	6.85e+05
Ac-227	8.65e+06	1.15e+06	5.14e+05	0.00e+00	3.70e+05	0.00e+00	3.79e+05
Th-227	3.36e+04	6.07e+02	9.67e+02	0.00e+00	3.45e+03	0.00e+00	1.32e+06
Th-228	2.25e+06	3.81e+04	7.62e+04	0.00e+00	2.12e+05	0.00e+00	2.55e+06
Th-229	6.31e+07	1.80e+06	1.04e+06	0.00e+00	8.72e+06	0.00e+00	3.62e+05
Th-230	9.55e+06	5.43e+05	2.64e+05	0.00e+00	2.62e+06	0.00e+00	2.79e+05
Th-232	1.07e+07	4.64e+05	6.96e+03	0.00e+00	2.24e+06	0.00e+00	2.37e+05
Th-234	2.22e+02	1.30e+01	6.40e+00	0.00e+00	7.39e+01	0.00e+00	3.13e+05
Pa-231	1.90e+07	7.14e+05	7.37e+05	0.00e+00	4.01e+06	0.00e+00	3.32e+05
Pa-233	1.53e+01	3.09e+00	2.66e+00	0.00e+00	1.16e+01	0.00e+00	4.78e+04
U-232	1.91e+09	0.00e+00	1.37e+08	0.00e+00	2.07e+08	0.00e+00	3.14e+07
U-233	4.04e+08	0.00e+00	2.45e+07	0.00e+00	9.41e+07	0.00e+00	2.91e+07
U-234	3.88e+08	0.00e+00	2.40e+07	0.00e+00	9.23e+07	0.00e+00	2.85e+07
U-235	3.71e+08	0.00e+00	2.25e+07	0.00e+00	8.67e+07	0.00e+00	3.62e+07
U-236	3.71e+08	0.00e+00	2.30e+07	0.00e+00	8.86e+07	0.00e+00	2.67e+07
U-237	6.78e+03	0.00e+00	1.81e+03	0.00e+00	2.79e+04	0.00e+00	2.38e+06
U-238	3.56e+08	0.00e+00	2.11e+07	0.00e+00	8.11e+07	0.00e+00	2.55e+07
Np-237	5.84e+06	4.15e+05	2.57e+05	0.00e+00	1.91e+06	0.00e+00	3.68e+05

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# GOAT's MILK PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, R<sub>i</sub>

R<sub>i</sub> factors for Adult age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Gaseous Release Goat's Milk Pathway R<sub>i</sub>

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Np-238	4.34e+00	1.17e-01	6.75e-02	0.00e+00	3.96e-01	0.00e+00	1.09e+04
Np-239	4.41e-01	4.34e-02	2.39e-02	0.00e+00	1.35e-01	0.00e+00	8.89e+03
Pu-238	1.17e+06	1.48e+05	3.17e+04	0.00e+00	1.36e+05	0.00e+00	1.35e+05
Pu-239	1.34e+06	1.62e+05	3.54e+04	0.00e+00	1.50e+05	0.00e+00	1.24e+05
Pu-240	1.34e+06	1.61e+05	3.54e+04	0.00e+00	1.50e+05	0.00e+00	1.26e+05
Pu-241	2.90e+04	1.38e+03	6.14e+02	0.00e+00	2.83e+03	0.00e+00	2.59e+03
Pu-242	1.25e+06	1.56e+05	3.41e+04	0.00e+00	1.45e+05	0.00e+00	1.21e+05
Pu-244	1.45e+06	1.78e+05	3.91e+04	0.00e+00	1.66e+05	0.00e+00	1.80e+05
Am-241	3.47e+06	3.24e+06	2.48e+05	0.00e+00	1.87e+06	0.00e+00	3.41e+05
Am-242m	3.53e+06	3.07e+06	2.52e+05	0.00e+00	1.88e+06	0.00e+00	4.33e+05
Am-243	3.50e+06	3.20e+06	2.46e+05	0.00e+00	1.85e+06	0.00e+00	4.03e+05
Cm-242	8.72e+04	9.27e+04	5.80e+03	0.00e+00	2.63e+04	0.00e+00	3.35e+05
Cm-243	2.77e+06	2.54e+06	1.74e+05	0.00e+00	8.10e+05	0.00e+00	3.62e+05
Cm-244	2.11e+06	1.98e+06	1.33e+05	0.00e+00	6.20e+05	0.00e+00	3.49e+05
Cm-245	4.35e+06	3.79e+06	2.67e+05	0.00e+00	1.25e+06	0.00e+00	3.26e+05
Cm-246	4.31e+06	3.78e+06	2.67e+05	0.00e+00	1.24e+06	0.00e+00	3.20e+05
Cm-247	4.21e+06	3.73e+06	2.63e+05	0.00e+00	1.22e+06	0.00e+00	4.21e+05
Cm-248	3.50e+07	3.07e+07	2.17e+06	0.00e+00	1.01e+07	0.00e+00	6.82e+06
Cf-252	1.19e+06	0.00e+00	2.87e+04	0.00e+00	0.00e+00	0.00e+00	1.31e+06

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# GOAT's MILK PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, R<sub>i</sub>

R<sub>i</sub> factors for Teen age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Gaseous Release Goat's Milk Pathway R<sub>i</sub>

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
H-3	0.00e+00	1.16e+03	1.16e+03	1.16e+03	1.16e+03	1.16e+03	1.16e+03
Be-10	5.36e+05	8.30e+04	1.35e+04	0.00e+00	6.34e+04	0.00e+00	3.40e+06
C-14	4.86e+08	9.72e+07	9.72e+07	9.72e+07	9.72e+07	9.72e+07	9.72e+07
N-13	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
F-18	9.97e-04	0.00e+00	1.09e-04	0.00e+00	0.00e+00	0.00e+00	8.97e-05
Na-22	1.10e+09	1.10e+09	1.10e+09	1.10e+09	1.10e+09	1.10e+09	1.10e+09
Na-24	5.12e+05	5.12e+05	5.12e+05	5.12e+05	5.12e+05	5.12e+05	5.12e+05
P-32	3.79e+10	2.35e+09	1.47e+09	0.00e+00	0.00e+00	0.00e+00	3.18e+09
Ca-41	1.89e+09	0.00e+00	2.04e+08	0.00e+00	0.00e+00	0.00e+00	1.87e+06
Sc-46	3.65e+01	7.11e+01	2.11e+01	0.00e+00	6.81e+01	0.00e+00	2.42e+05
Cr-51	0.00e+00	0.00e+00	5.99e+03	3.33e+03	1.31e+03	8.55e+03	1.01e+06
Mn-54	0.00e+00	1.68e+06	3.34e+05	0.00e+00	5.02e+05	0.00e+00	3.45e+06
Mn-56	0.00e+00	8.83e-04	1.57e-04	0.00e+00	1.12e-03	0.00e+00	5.81e-02
Fe-55	5.79e+05	4.10e+05	9.57e+04	0.00e+00	0.00e+00	2.60e+05	1.78e+05
Fe-59	6.74e+05	1.57e+06	6.07e+05	0.00e+00	0.00e+00	4.96e+05	3.72e+06
Co-57	0.00e+00	2.69e+05	4.52e+05	0.00e+00	0.00e+00	0.00e+00	5.03e+06
Co-58	0.00e+00	9.52e+05	2.19e+06	0.00e+00	0.00e+00	0.00e+00	1.31e+07
Co-60	0.00e+00	3.34e+06	7.51e+06	0.00e+00	0.00e+00	0.00e+00	4.34e+07
Ni-59	1.06e+08	3.74e+07	1.80e+07	0.00e+00	0.00e+00	0.00e+00	5.86e+06
Ni-63	1.42e+09	1.00e+08	4.81e+07	0.00e+00	0.00e+00	0.00e+00	1.59e+07
Ni-65	8.25e-02	1.05e-02	4.80e-03	0.00e+00	0.00e+00	0.00e+00	5.72e-01
Cu-64	0.00e+00	4.75e+03	2.23e+03	0.00e+00	1.20e+04	0.00e+00	3.68e+05
Zn-65	2.53e+08	8.78e+08	4.09e+08	0.00e+00	5.62e+08	0.00e+00	3.72e+08
Zn-69	4.82e-13	9.18e-13	6.42e-14	0.00e+00	6.00e-13	0.00e+00	1.69e-12
Zn-69m	3.96e+04	9.35e+04	8.57e+03	0.00e+00	5.68e+04	0.00e+00	5.14e+06
Se-79	0.00e+00	2.01e+08	3.38e+07	0.00e+00	3.50e+08	0.00e+00	3.07e+07
Br-82	0.00e+00	0.00e+00	6.73e+06	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Br-83	0.00e+00	0.00e+00	2.18e-02	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Br-84	0.00e+00	0.00e+00	3.71e-24	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

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.



# GOAT'S MILK PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, R<sub>i</sub>

Ri factors for Teen age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Gaseous Release Goat's Milk Pathway Ri

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Rb-86	0.00e+00	5.67e+08	2.67e+08	0.00e+00	0.00e+00	0.00e+00	8.40e+07
Rb-87	0.00e+00	6.28e+08	2.19e+08	0.00e+00	0.00e+00	0.00e+00	2.19e+07
Rb-88	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
Sr-89	5.62e+09	0.00e+00	1.61e+08	0.00e+00	0.00e+00	0.00e+00	6.69e+08
Sr-90	1.71e+11	0.00e+00	3.41e+09	0.00e+00	0.00e+00	0.00e+00	3.90e+09
Sr-91	1.12e+05	0.00e+00	4.46e+03	0.00e+00	0.00e+00	0.00e+00	5.08e+05
Sr-92	1.90e+00	0.00e+00	8.11e-02	0.00e+00	0.00e+00	0.00e+00	4.85e+01
Y-90	1.56e+01	0.00e+00	4.21e-01	0.00e+00	0.00e+00	0.00e+00	1.29e+05
Y-91	1.90e+03	0.00e+00	5.08e+01	0.00e+00	0.00e+00	0.00e+00	7.77e+05
Y-91m	1.38e-20	0.00e+00	5.26e-22	0.00e+00	0.00e+00	0.00e+00	6.50e-19
Y-92	1.25e-05	0.00e+00	3.62e-07	0.00e+00	0.00e+00	0.00e+00	3.43e-01
Y-93	4.96e-02	0.00e+00	1.36e-03	0.00e+00	0.00e+00	0.00e+00	1.52e+03
Zr-93	3.31e+02	1.63e+01	8.91e+00	0.00e+00	5.77e+01	0.00e+00	1.54e+04
Zr-95	1.98e+02	6.25e+01	4.30e+01	0.00e+00	9.18e+01	0.00e+00	1.44e+05
Zr-97	9.48e-02	1.88e-02	8.64e-03	0.00e+00	2.84e-02	0.00e+00	5.08e+03
Nb-93m	1.03e+05	3.37e+04	8.44e+03	0.00e+00	3.94e+04	0.00e+00	1.21e+07
Nb-95	1.69e+04	9.37e+03	5.16e+03	0.00e+00	9.08e+03	0.00e+00	4.01e+07
Nb-97	1.44e-12	3.57e-13	1.30e-13	0.00e+00	4.18e-13	0.00e+00	8.53e-09
Mo-93	0.00e+00	9.51e+07	2.60e+06	0.00e+00	2.73e+07	0.00e+00	1.16e+07
Mo-99	0.00e+00	5.37e+06	1.02e+06	0.00e+00	1.23e+07	0.00e+00	9.62e+06
Tc-101	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Tc-99	5.35e+06	7.87e+06	2.14e+06	0.00e+00	9.99e+07	8.14e+05	1.93e+08
Tc-99m	6.96e-01	1.94e+00	2.51e+01	0.00e+00	2.89e+01	1.08e+00	1.27e+03
Ru-103	2.17e+02	0.00e+00	9.29e+01	0.00e+00	7.66e+02	0.00e+00	1.81e+04
Ru-105	1.89e-04	0.00e+00	7.35e-05	0.00e+00	2.39e-03	0.00e+00	1.53e-01
Ru-106	4.50e+03	0.00e+00	5.67e+02	0.00e+00	8.68e+03	0.00e+00	2.16e+05
Rh-105	7.66e+04	5.54e+04	3.63e+04	0.00e+00	2.35e+05	0.00e+00	7.04e+06
Pd-107	0.00e+00	2.49e+06	1.60e+05	0.00e+00	2.25e+07	0.00e+00	1.16e+07
Pd-109	0.00e+00	9.87e+03	2.24e+03	0.00e+00	5.70e+04	0.00e+00	9.95e+05

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# GOAT's MILK PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, R<sub>i</sub>

R<sub>i</sub> factors for Teen age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Gaseous Release Goat's Milk Pathway R<sub>i</sub>

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Ag-110m	1.16e+07	1.09e+07	6.65e+06	0.00e+00	2.08e+07	0.00e+00	3.07e+09
Ag-111	1.43e+06	5.93e+05	2.98e+05	0.00e+00	1.93e+06	0.00e+00	8.28e+08
Cd-113m	0.00e+00	6.46e+05	2.08e+04	0.00e+00	7.14e+05	0.00e+00	3.88e+06
Cd-115m	0.00e+00	2.75e+05	8.89e+03	0.00e+00	2.20e+05	0.00e+00	8.72e+06
Sn-123	1.19e+08	1.95e+06	2.88e+06	1.56e+06	0.00e+00	0.00e+00	1.79e+08
Sn-125	1.26e+07	2.50e+05	5.66e+05	1.96e+05	0.00e+00	0.00e+00	1.18e+08
Sn-126	3.47e+08	6.46e+06	9.87e+06	1.70e+06	0.00e+00	0.00e+00	7.72e+07
Sb-124	5.51e+06	1.01e+05	2.15e+06	1.25e+04	0.00e+00	4.81e+06	1.11e+08
Sb-125	4.38e+06	4.79e+04	1.03e+06	4.19e+03	0.00e+00	3.85e+06	3.41e+07
Sb-126	1.20e+06	2.46e+04	4.33e+05	6.81e+03	0.00e+00	8.64e+05	7.13e+07
Sb-127	9.88e+04	2.11e+03	3.73e+04	1.11e+03	0.00e+00	6.72e+04	1.68e+07
Te-125m	3.60e+06	1.30e+06	4.82e+05	1.01e+06	0.00e+00	0.00e+00	1.06e+07
Te-127	1.46e+02	5.17e+01	3.14e+01	1.01e+02	5.91e+02	0.00e+00	1.13e+04
Te-127m	1.01e+07	3.59e+06	1.20e+06	2.41e+06	4.10e+07	0.00e+00	2.52e+07
Te-129	6.45e-11	2.40e-11	1.57e-11	4.61e-11	2.71e-10	0.00e+00	3.53e-10
Te-129m	1.32e+07	4.90e+06	2.09e+06	4.26e+06	5.53e+07	0.00e+00	4.96e+07
Te-131	8.67e-34	3.57e-34	2.71e-34	6.68e-34	3.79e-33	0.00e+00	7.11e-35
Te-131m	7.89e+04	3.79e+04	3.16e+04	5.69e+04	3.95e+05	0.00e+00	3.04e+06
Te-132	5.15e+05	3.26e+05	3.07e+05	3.44e+05	3.13e+06	0.00e+00	1.03e+07
Te-133m	4.74e-14	2.69e-14	2.62e-14	3.76e-14	2.66e-13	0.00e+00	1.09e-13
Te-134	2.01e-19	1.29e-19	1.35e-19	1.65e-19	1.23e-18	0.00e+00	7.47e-21
I-129	1.67e+08	1.41e+08	2.35e+08	1.71e+11	2.52e+08	0.00e+00	1.64e+07
I-130	8.89e+04	2.57e+05	1.03e+05	2.10e+07	3.96e+05	0.00e+00	1.98e+05
I-131	6.45e+07	9.03e+07	4.85e+07	2.63e+10	1.55e+08	0.00e+00	1.79e+07
I-132	3.55e-02	9.30e-02	3.34e-02	3.13e+00	1.47e-01	0.00e+00	4.05e-02
I-133	8.50e+05	1.44e+06	4.40e+05	2.01e+08	2.53e+06	0.00e+00	1.09e+06
I-134	4.49e-13	1.19e-12	4.28e-13	1.98e-11	1.88e-12	0.00e+00	1.57e-14
I-135	2.75e+03	7.09e+03	2.63e+03	4.56e+05	1.12e+04	0.00e+00	7.85e+03
Cs-134	2.94e+10	6.93e+10	3.22e+10	0.00e+00	2.20e+10	8.41e+09	8.62e+08
Cs-134m	9.40e-01	1.95e+00	1.00e+00	0.00e+00	1.08e+00	1.90e-01	1.30e+00

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# GOAT's MILK PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, R<sub>i</sub>

Ri factors for Teen age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Gaseous Release Goat's Milk Pathway Ri

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Cs-135	9.98e+09	9.15e+09	2.14e+09	0.00e+00	3.49e+09	1.26e+09	1.60e+08
Cs-136	1.34e+09	5.29e+09	3.55e+09	0.00e+00	2.88e+09	4.54e+08	4.26e+08
Cs-137	4.02e+10	5.34e+10	1.86e+10	0.00e+00	1.82e+10	7.06e+09	7.60e+08
Cs-138	5.29e-23	1.02e-22	5.08e-23	0.00e+00	7.49e-23	8.72e-24	4.61e-26
Cs-139	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Ba-139	1.01e-08	7.09e-12	2.94e-10	0.00e+00	6.69e-12	4.89e-12	8.99e-08
Ba-140	5.82e+06	7.14e+03	3.75e+05	0.00e+00	2.42e+03	4.80e+03	8.98e+06
Ba-141	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	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
La-140	9.73e-01	4.78e-01	1.27e-01	0.00e+00	0.00e+00	0.00e+00	2.75e+04
La-141	6.63e-06	2.04e-06	3.36e-07	0.00e+00	0.00e+00	0.00e+00	3.61e-01
La-142	4.12e-12	1.83e-12	4.56e-13	0.00e+00	0.00e+00	0.00e+00	5.57e-08
Ce-141	1.07e+03	7.12e+02	8.17e+01	0.00e+00	3.35e+02	0.00e+00	2.04e+06
Ce-143	9.18e+00	6.68e+03	7.46e-01	0.00e+00	2.99e+00	0.00e+00	2.01e+05
Ce-144	7.90e+04	3.27e+04	4.24e+03	0.00e+00	1.95e+04	0.00e+00	1.99e+07
Pr-143	3.48e+01	1.39e+01	1.73e+00	0.00e+00	8.08e+00	0.00e+00	1.15e+05
Pr-144	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Nd-147	2.17e+01	2.36e+01	1.42e+00	0.00e+00	1.39e+01	0.00e+00	8.53e+04
Pm-147	6.18e+02	5.86e+01	2.39e+01	0.00e+00	1.12e+02	0.00e+00	5.58e+04
Pm-148	1.31e+01	2.13e+00	1.07e+00	0.00e+00	3.84e+00	0.00e+00	1.27e+05
Pm-148m	1.79e+02	4.54e+01	3.55e+01	0.00e+00	6.87e+01	0.00e+00	2.86e+05
Pm-149	9.45e-01	1.33e-01	5.45e-02	0.00e+00	2.53e-01	0.00e+00	1.96e+04
Pm-151	1.42e-01	2.34e-02	1.19e-02	0.00e+00	4.21e-02	0.00e+00	5.26e+03
Sm-151	5.22e+02	1.00e+02	2.36e+01	0.00e+00	1.10e+02	0.00e+00	3.41e+04
Sm-153	4.38e-01	3.63e-01	2.67e-02	0.00e+00	1.19e-01	0.00e+00	1.02e+04
Eu-152	1.46e+03	3.52e+02	3.10e+02	0.00e+00	1.63e+03	0.00e+00	1.29e+05
Eu-154	4.73e+03	6.10e+02	4.30e+02	0.00e+00	2.73e+03	0.00e+00	3.22e+05
Eu-155	1.02e+03	9.82e+01	6.08e+01	0.00e+00	3.84e+02	0.00e+00	5.63e+05
Eu-156	5.46e+01	4.09e+01	6.68e+00	0.00e+00	2.75e+01	0.00e+00	2.09e+05
Tb-160	3.18e+02	0.00e+00	3.97e+01	0.00e+00	1.26e+02	0.00e+00	2.06e+05

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# GOAT's MILK PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, R<sub>i</sub>

R<sub>i</sub> factors for Teen age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Gaseous Release Goat's Milk Pathway R<sub>i</sub>

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Ho-166m	2.14e+03	6.58e+02	4.76e+02	0.00e+00	9.63e+02	0.00e+00	1.62e+05
W-181	7.53e+03	2.43e+03	2.54e+02	0.00e+00	0.00e+00	0.00e+00	2.07e+05
W-185	2.87e+05	9.46e+04	1.00e+04	0.00e+00	0.00e+00	0.00e+00	8.17e+06
W-187	1.43e+03	1.17e+03	4.09e+02	0.00e+00	0.00e+00	0.00e+00	3.16e+05
Pb-210	1.34e+10	4.03e+09	5.19e+08	0.00e+00	1.27e+10	0.00e+00	1.75e+06
Bi-210	7.88e+04	5.39e+05	4.51e+04	0.00e+00	6.55e+06	0.00e+00	6.16e+06
Po-210	1.64e+08	3.45e+08	3.97e+07	0.00e+00	1.16e+09	0.00e+00	2.18e+07
Ra-223	2.71e+10	4.11e+07	5.40e+09	0.00e+00	1.18e+09	0.00e+00	1.30e+09
Ra-224	3.14e+09	7.50e+06	6.26e+08	0.00e+00	2.15e+08	0.00e+00	5.04e+08
Ra-225	4.20e+10	4.93e+07	8.38e+09	0.00e+00	1.41e+09	0.00e+00	1.46e+09
Ra-226	3.08e+12	7.78e+07	2.29e+12	0.00e+00	2.22e+09	0.00e+00	3.36e+09
Ra-228	1.30e+12	4.19e+07	1.44e+12	0.00e+00	1.20e+09	0.00e+00	5.68e+08
Ac-225	1.37e+04	1.86e+04	9.16e+02	0.00e+00	2.14e+03	0.00e+00	9.46e+05
Ac-227	1.22e+07	1.81e+06	7.29e+05	0.00e+00	5.26e+05	0.00e+00	5.18e+05
Th-227	6.19e+04	1.11e+03	1.79e+03	0.00e+00	6.35e+03	0.00e+00	1.82e+06
Th-228	3.98e+06	6.67e+04	1.35e+05	0.00e+00	3.75e+05	0.00e+00	3.49e+06
Th-229	8.56e+07	2.46e+06	1.42e+06	0.00e+00	1.19e+07	0.00e+00	4.95e+05
Th-230	1.29e+07	7.36e+05	3.59e+05	0.00e+00	3.58e+06	0.00e+00	3.82e+05
Th-232	1.45e+07	6.28e+05	9.75e+03	0.00e+00	3.06e+06	0.00e+00	3.25e+05
Th-234	4.07e+02	2.39e+01	1.18e+01	0.00e+00	1.36e+02	0.00e+00	4.32e+05
Pa-231	2.58e+07	9.69e+05	1.01e+06	0.00e+00	5.44e+06	0.00e+00	4.55e+05
Pa-233	2.76e+01	5.31e+00	4.74e+00	0.00e+00	2.00e+01	0.00e+00	6.06e+04
U-232	3.52e+09	0.00e+00	2.52e+08	0.00e+00	3.82e+08	0.00e+00	4.30e+07
U-233	7.42e+08	0.00e+00	4.51e+07	0.00e+00	1.74e+08	0.00e+00	3.98e+07
U-234	7.12e+08	0.00e+00	4.42e+07	0.00e+00	1.71e+08	0.00e+00	3.90e+07
U-235	6.82e+08	0.00e+00	4.15e+07	0.00e+00	1.60e+08	0.00e+00	4.95e+07
U-236	6.82e+08	0.00e+00	4.24e+07	0.00e+00	1.63e+08	0.00e+00	3.66e+07
U-237	1.25e+04	0.00e+00	3.33e+03	0.00e+00	5.14e+04	0.00e+00	3.31e+06
U-238	6.52e+08	0.00e+00	3.88e+07	0.00e+00	1.50e+08	0.00e+00	3.49e+07
Np-237	7.96e+06	5.71e+05	3.50e+05	0.00e+00	2.59e+06	0.00e+00	5.03e+05

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# GOAT's MILK PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, R<sub>i</sub>

R<sub>i</sub> factors for Teen age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Gaseous Release Goat's Milk Pathway R<sub>i</sub>

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Np-238	7.98e+00	2.14e-01	1.24e-01	0.00e+00	7.32e-01	0.00e+00	1.57e+04
Np-239	8.42e-01	7.94e-02	4.41e-02	0.00e+00	2.49e-01	0.00e+00	1.28e+04
Pu-238	1.60e+06	2.05e+05	4.35e+04	0.00e+00	1.87e+05	0.00e+00	1.85e+05
Pu-239	1.83e+06	2.22e+05	4.81e+04	0.00e+00	2.05e+05	0.00e+00	1.69e+05
Pu-240	1.83e+06	2.22e+05	4.81e+04	0.00e+00	2.05e+05	0.00e+00	1.72e+05
Pu-241	4.18e+04	2.00e+03	8.81e+02	0.00e+00	4.08e+03	0.00e+00	3.53e+03
Pu-242	1.70e+06	2.14e+05	4.64e+04	0.00e+00	1.97e+05	0.00e+00	1.66e+05
Pu-244	1.98e+06	2.44e+05	5.31e+04	0.00e+00	2.26e+05	0.00e+00	2.47e+05
Am-241	4.73e+06	4.46e+06	3.41e+05	0.00e+00	2.55e+06	0.00e+00	4.66e+05
Am-242m	4.83e+06	4.25e+06	3.47e+05	0.00e+00	2.57e+06	0.00e+00	5.92e+05
Am-243	4.76e+06	4.40e+06	3.36e+05	0.00e+00	2.52e+06	0.00e+00	5.52e+05
Cm-242	1.61e+05	1.69e+05	1.07e+04	0.00e+00	4.86e+04	0.00e+00	4.59e+05
Cm-243	3.88e+06	3.60e+06	2.44e+05	0.00e+00	1.14e+06	0.00e+00	4.95e+05
Cm-244	3.01e+06	2.85e+06	1.90e+05	0.00e+00	8.89e+05	0.00e+00	4.78e+05
Cm-245	5.92e+06	5.21e+06	3.65e+05	0.00e+00	1.71e+06	0.00e+00	4.46e+05
Cm-246	5.88e+06	5.21e+06	3.64e+05	0.00e+00	1.70e+06	0.00e+00	4.39e+05
Cm-247	5.73e+06	5.13e+06	3.59e+05	0.00e+00	1.68e+06	0.00e+00	5.76e+05
Cm-248	4.76e+07	4.22e+07	2.96e+06	0.00e+00	1.38e+07	0.00e+00	9.27e+06
Cf-252	2.04e+06	0.00e+00	4.92e+04	0.00e+00	0.00e+00	0.00e+00	1.79e+06

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# GOAT's MILK PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, R<sub>i</sub>

Ri factors for Child age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Gaseous Release Goat's Milk Pathway Ri

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
H-3	0.00e+00	1.83e+03	1.83e+03	1.83e+03	1.83e+03	1.83e+03	1.83e+03
Be-10	1.33e+06	1.55e+05	3.35e+04	0.00e+00	1.10e+05	0.00e+00	2.71e+06
C-14	1.19e+09	2.39e+08	2.39e+08	2.39e+08	2.39e+08	2.39e+08	2.39e+08
N-13	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
F-18	2.37e-03	0.00e+00	2.35e-04	0.00e+00	0.00e+00	0.00e+00	6.41e-04
Na-22	2.28e+09	2.28e+09	2.28e+09	2.28e+09	2.28e+09	2.28e+09	2.28e+09
Na-24	1.07e+06	1.07e+06	1.07e+06	1.07e+06	1.07e+06	1.07e+06	1.07e+06
P-32	9.33e+10	4.37e+09	3.60e+09	0.00e+00	0.00e+00	0.00e+00	2.58e+09
Ca-41	2.74e+09	0.00e+00	2.99e+08	0.00e+00	0.00e+00	0.00e+00	1.50e+06
Sc-46	8.20e+01	1.12e+02	4.33e+01	0.00e+00	9.94e+01	0.00e+00	1.64e+05
Cr-51	0.00e+00	0.00e+00	1.22e+04	6.78e+03	1.85e+03	1.24e+04	6.48e+05
Mn-54	0.00e+00	2.52e+06	6.70e+05	0.00e+00	7.06e+05	0.00e+00	2.11e+06
Mn-56	0.00e+00	1.54e-03	3.48e-04	0.00e+00	1.86e-03	0.00e+00	2.23e-01
Fe-55	1.45e+06	7.71e+05	2.39e+05	0.00e+00	0.00e+00	4.36e+05	1.43e+05
Fe-59	1.56e+06	2.53e+06	1.26e+06	0.00e+00	0.00e+00	7.33e+05	2.63e+06
Co-57	0.00e+00	4.60e+05	9.32e+05	0.00e+00	0.00e+00	0.00e+00	3.77e+06
Co-58	0.00e+00	1.45e+06	4.45e+06	0.00e+00	0.00e+00	0.00e+00	8.49e+06
Co-60	0.00e+00	5.18e+06	1.53e+07	0.00e+00	0.00e+00	0.00e+00	2.87e+07
Ni-59	2.66e+08	7.08e+07	4.51e+07	0.00e+00	0.00e+00	0.00e+00	4.70e+06
Ni-63	3.56e+09	1.90e+08	1.21e+08	0.00e+00	0.00e+00	0.00e+00	1.28e+07
Ni-65	2.02e-01	1.90e-02	1.11e-02	0.00e+00	0.00e+00	0.00e+00	2.33e+00
Cu-64	0.00e+00	8.34e+03	5.04e+03	0.00e+00	2.02e+04	0.00e+00	3.92e+05
Zn-65	4.96e+08	1.32e+09	8.22e+08	0.00e+00	8.33e+08	0.00e+00	2.32e+08
Zn-69	1.18e-12	1.71e-12	1.58e-13	0.00e+00	1.04e-12	0.00e+00	1.08e-10
Zn-69m	9.68e+04	1.65e+05	1.95e+04	0.00e+00	9.58e+04	0.00e+00	5.37e+06
Se-79	0.00e+00	3.75e+08	8.31e+07	0.00e+00	6.09e+08	0.00e+00	2.46e+07
Br-82	0.00e+00	0.00e+00	1.38e+07	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Br-83	0.00e+00	0.00e+00	5.36e-02	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Br-84	0.00e+00	0.00e+00	8.40e-24	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

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# GOAT's MILK PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, R<sub>i</sub>

Ri factors for Child age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Gaseous Release Goat's Milk Pathway Ri

Nuclide

Organ Dose Conversion Factors

	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Rb-86	0.00e+00	1.05e+09	6.47e+08	0.00e+00	0.00e+00	0.00e+00	6.77e+07
Rb-87	0.00e+00	1.17e+09	5.42e+08	0.00e+00	0.00e+00	0.00e+00	1.75e+07
Rb-88	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
Sr-89	1.39e+10	0.00e+00	3.97e+08	0.00e+00	0.00e+00	0.00e+00	5.38e+08
Sr-90	3.53e+11	0.00e+00	7.11e+09	0.00e+00	0.00e+00	0.00e+00	3.16e+09
Sr-91	2.75e+05	0.00e+00	1.04e+04	0.00e+00	0.00e+00	0.00e+00	6.07e+05
Sr-92	4.65e+00	0.00e+00	1.86e-01	0.00e+00	0.00e+00	0.00e+00	8.81e+01
Y-90	3.87e+01	0.00e+00	1.04e+00	0.00e+00	0.00e+00	0.00e+00	1.10e+05
Y-91	4.68e+03	0.00e+00	1.25e+02	0.00e+00	0.00e+00	0.00e+00	6.24e+05
Y-91m	3.36e-20	0.00e+00	1.22e-21	0.00e+00	0.00e+00	0.00e+00	6.59e-17
Y-92	3.07e-05	0.00e+00	8.78e-07	0.00e+00	0.00e+00	0.00e+00	8.87e-01
Y-93	1.22e-01	0.00e+00	3.35e-03	0.00e+00	0.00e+00	0.00e+00	1.82e+03
Zr-93	8.24e+02	3.09e+01	2.20e+01	0.00e+00	1.19e+02	0.00e+00	1.17e+04
Zr-95	4.60e+02	1.01e+02	9.00e+01	0.00e+00	1.45e+02	0.00e+00	1.05e+05
Zr-97	2.31e-01	3.33e-02	1.97e-02	0.00e+00	4.79e-02	0.00e+00	5.05e+03
Nb-93m	2.58e+05	6.45e+04	2.12e+04	0.00e+00	6.96e+04	0.00e+00	9.72e+06
Nb-95	3.81e+04	1.49e+04	1.06e+04	0.00e+00	1.40e+04	0.00e+00	2.75e+07
Nb-97	3.49e-12	6.31e-13	2.95e-13	0.00e+00	7.00e-13	0.00e+00	1.95e-07
Mo-93	0.00e+00	1.78e+08	6.40e+06	0.00e+00	4.70e+07	0.00e+00	9.03e+06
Mo-99	0.00e+00	9.77e+06	2.42e+06	0.00e+00	2.09e+07	0.00e+00	8.08e+06
Tc-101	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Tc-99	1.32e+07	1.47e+07	5.28e+06	0.00e+00	1.73e+08	1.30e+06	1.54e+08
Tc-99m	1.60e+00	3.13e+00	5.19e+01	0.00e+00	4.55e+01	1.59e+00	1.78e+03
Ru-103	5.14e+02	0.00e+00	1.98e+02	0.00e+00	1.29e+03	0.00e+00	1.33e+04
Ru-105	4.62e-04	0.00e+00	1.68e-04	0.00e+00	4.06e-03	0.00e+00	3.02e-01
Ru-106	1.11e+04	0.00e+00	1.38e+03	0.00e+00	1.50e+04	0.00e+00	1.72e+05
Rh-105	1.88e+05	1.01e+05	8.62e+04	0.00e+00	4.02e+05	0.00e+00	6.25e+06
Pd-107	0.00e+00	4.66e+06	3.96e+05	0.00e+00	3.90e+07	0.00e+00	9.25e+06
Pd-109	0.00e+00	1.84e+04	5.51e+03	0.00e+00	9.86e+04	0.00e+00	1.09e+06

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# GOAT's MILK PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, $R_i$

Ri factors for Child age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Gaseous Release Goat's Milk Pathway Ri

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Ag-110m	2.51e+07	1.69e+07	1.35e+07	0.00e+00	3.15e+07	0.00e+00	2.01e+09
Ag-111	3.53e+06	1.10e+06	7.29e+05	0.00e+00	3.33e+06	0.00e+00	6.76e+08
Cd-113m	0.00e+00	1.20e+06	5.13e+04	0.00e+00	1.24e+06	0.00e+00	3.11e+06
Cd-115m	0.00e+00	5.15e+05	2.19e+04	0.00e+00	3.83e+05	0.00e+00	7.00e+06
Sn-123	2.93e+08	3.63e+06	7.14e+06	3.85e+06	0.00e+00	0.00e+00	1.44e+08
Sn-125	3.09e+07	4.66e+05	1.38e+06	4.83e+05	0.00e+00	0.00e+00	9.57e+07
Sn-126	8.22e+08	1.02e+07	2.33e+07	2.81e+06	0.00e+00	0.00e+00	6.17e+07
Sb-124	1.30e+07	1.69e+05	4.57e+06	2.88e+04	0.00e+00	7.23e+06	8.15e+07
Sb-125	1.04e+07	8.05e+04	2.19e+06	9.67e+03	0.00e+00	5.82e+06	2.49e+07
Sb-126	2.75e+06	4.21e+04	9.88e+05	1.61e+04	0.00e+00	1.31e+06	5.55e+07
Sb-127	2.38e+05	3.68e+03	8.26e+04	2.65e+03	0.00e+00	1.03e+05	1.34e+07
Te-125m	8.85e+06	2.40e+06	1.18e+06	2.48e+06	0.00e+00	0.00e+00	8.54e+06
Te-127	3.59e+02	9.67e+01	7.69e+01	2.48e+02	1.02e+03	0.00e+00	1.40e+04
Te-127m	2.50e+07	6.72e+06	2.96e+06	5.97e+06	7.12e+07	0.00e+00	2.02e+07
Te-129	1.59e-10	4.44e-11	3.78e-11	1.14e-10	4.65e-10	0.00e+00	9.90e-09
Te-129m	3.26e+07	9.09e+06	5.06e+06	1.05e+07	9.56e+07	0.00e+00	3.97e+07
Te-131	2.13e-33	6.48e-34	6.33e-34	1.63e-33	6.43e-33	0.00e+00	1.12e-32
Te-131m	1.92e+05	6.65e+04	7.07e+04	1.37e+05	6.43e+05	0.00e+00	2.70e+06
Te-132	1.23e+06	5.44e+05	6.58e+05	7.93e+05	5.05e+06	0.00e+00	5.48e+06
Te-133m	1.13e-13	4.59e-14	5.69e-14	8.80e-14	4.36e-13	0.00e+00	3.50e-12
Te-134	4.79e-19	2.15e-19	2.87e-19	3.78e-19	1.99e-18	0.00e+00	2.19e-18
I-129	4.12e+08	2.53e+08	2.26e+08	1.65e+11	4.26e+08	0.00e+00	1.27e+07
I-130	2.08e+05	4.20e+05	2.16e+05	4.63e+07	6.28e+05	0.00e+00	1.97e+05
I-131	1.56e+08	1.57e+08	8.94e+07	5.20e+10	2.58e+08	0.00e+00	1.40e+07
I-132	8.41e-02	1.54e-01	7.10e-02	7.17e+00	2.36e-01	0.00e+00	1.82e-01
I-133	2.06e+06	2.55e+06	9.66e+05	4.74e+08	4.25e+06	0.00e+00	1.03e+06
I-134	1.06e-12	1.98e-12	9.09e-13	4.54e-11	3.02e-12	0.00e+00	1.31e-12
I-135	6.52e+03	1.17e+04	5.55e+03	1.04e+06	1.80e+04	0.00e+00	8.94e+03
Cs-134	6.79e+10	1.11e+11	2.35e+10	0.00e+00	3.45e+10	1.24e+10	6.01e+08
Cs-134m	2.23e+00	3.30e+00	2.15e+00	0.00e+00	1.74e+00	2.88e-01	4.17e+00

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.



# GOAT's MILK PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, R<sub>i</sub>

Ri factors for Child age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Gaseous Release Goat's Milk Pathway Ri

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Cs-135	2.46e+10	1.71e+10	1.76e+09	0.00e+00	6.04e+09	2.02e+09	1.28e+08
Cs-136	3.04e+09	8.34e+09	5.40e+09	0.00e+00	4.44e+09	6.63e+08	2.93e+08
Cs-137	9.67e+10	9.26e+10	1.37e+10	0.00e+00	3.02e+10	1.09e+10	5.80e+08
Cs-138	1.28e-22	1.78e-22	1.13e-22	0.00e+00	1.25e-22	1.35e-23	8.21e-23
Cs-139	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Ba-139	2.48e-08	1.32e-11	7.18e-10	0.00e+00	1.15e-11	7.78e-12	1.43e-06
Ba-140	1.41e+07	1.23e+04	8.20e+05	0.00e+00	4.01e+03	7.34e+03	7.12e+06
Ba-141	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	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
La-140	2.33e+00	8.15e-01	2.75e-01	0.00e+00	0.00e+00	0.00e+00	2.27e+04
La-141	1.63e-05	3.81e-06	8.27e-07	0.00e+00	0.00e+00	0.00e+00	8.47e-01
La-142	9.95e-12	3.17e-12	9.94e-13	0.00e+00	0.00e+00	0.00e+00	6.29e-07
Ce-141	2.62e+03	1.31e+03	1.94e+02	0.00e+00	5.74e+02	0.00e+00	1.63e+06
Ce-143	2.25e+01	1.22e+04	1.77e+00	0.00e+00	5.12e+00	0.00e+00	1.79e+05
Ce-144	1.95e+05	6.10e+04	1.04e+04	0.00e+00	3.38e+04	0.00e+00	1.59e+07
Pr-143	8.62e+01	2.59e+01	4.28e+00	0.00e+00	1.40e+01	0.00e+00	9.30e+04
Pr-144	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Nd-147	5.34e+01	4.32e+01	3.35e+00	0.00e+00	2.37e+01	0.00e+00	6.85e+04
Pm-147	1.54e+03	1.10e+02	5.93e+01	0.00e+00	1.95e+02	0.00e+00	4.46e+04
Pm-148	3.19e+01	3.84e+00	2.48e+00	0.00e+00	6.52e+00	0.00e+00	1.03e+05
Pm-148m	3.67e+02	7.31e+01	7.31e+01	0.00e+00	1.08e+02	0.00e+00	2.06e+05
Pm-149	2.33e+00	2.48e-01	1.34e-01	0.00e+00	4.38e-01	0.00e+00	1.69e+04
Pm-151	3.46e-01	4.21e-02	2.74e-02	0.00e+00	7.13e-02	0.00e+00	4.78e+03
Sm-151	1.26e+03	1.88e+02	5.92e+01	0.00e+00	1.94e+02	0.00e+00	2.73e+04
Sm-153	1.08e+00	6.73e-01	6.49e-02	0.00e+00	2.05e-01	0.00e+00	8.95e+03
Eu-152	3.03e+03	5.51e+02	6.54e+02	0.00e+00	2.33e+03	0.00e+00	9.05e+04
Eu-154	1.14e+04	1.02e+03	9.33e+02	0.00e+00	4.49e+03	0.00e+00	2.37e+05
Eu-155	2.32e+03	1.67e+02	1.31e+02	0.00e+00	6.27e+02	0.00e+00	4.19e+05
Eu-156	1.32e+02	7.06e+01	1.46e+01	0.00e+00	4.55e+01	0.00e+00	1.60e+05
Tb-160	6.73e+02	0.00e+00	8.35e+01	0.00e+00	2.00e+02	0.00e+00	1.49e+05

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# GOAT's MILK PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, R<sub>i</sub>

Ri factors for Child age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Gaseous Release Goat's Milk Pathway Ri

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Ho-166m	5.33e+03	1.12e+03	9.43e+02	0.00e+00	1.59e+03	0.00e+00	1.30e+05
W-181	1.85e+04	4.55e+03	6.25e+02	0.00e+00	0.00e+00	0.00e+00	1.66e+05
W-185	7.07e+05	1.76e+05	2.47e+04	0.00e+00	0.00e+00	0.00e+00	6.58e+06
W-187	3.47e+03	2.06e+03	9.22e+02	0.00e+00	0.00e+00	0.00e+00	2.89e+05
Pb-210	2.90e+10	7.45e+09	1.28e+09	0.00e+00	2.24e+10	0.00e+00	1.40e+06
Bi-210	1.94e+05	1.01e+06	1.11e+05	0.00e+00	1.13e+07	0.00e+00	5.10e+06
Po-210	4.05e+08	6.47e+08	9.77e+07	0.00e+00	2.01e+09	0.00e+00	1.74e+07
Ra-223	6.65e+10	7.69e+07	1.33e+10	0.00e+00	2.04e+09	0.00e+00	1.06e+09
Ra-224	7.72e+09	1.40e+07	1.55e+09	0.00e+00	3.71e+08	0.00e+00	4.24e+08
Ra-225	1.03e+11	9.24e+07	2.07e+10	0.00e+00	2.45e+09	0.00e+00	1.19e+09
Ra-226	4.54e+12	1.45e+08	3.73e+12	0.00e+00	3.85e+09	0.00e+00	2.69e+09
Ra-228	3.02e+12	7.83e+07	3.39e+12	0.00e+00	2.08e+09	0.00e+00	4.56e+08
Ac-225	3.37e+04	3.47e+04	2.26e+03	0.00e+00	3.71e+03	0.00e+00	7.72e+05
Ac-227	2.03e+07	3.27e+06	1.26e+06	0.00e+00	7.19e+05	0.00e+00	4.15e+05
Th-227	1.53e+05	2.08e+03	4.41e+03	0.00e+00	1.10e+04	0.00e+00	1.47e+06
Th-228	1.00e+07	1.28e+05	3.38e+05	0.00e+00	6.66e+05	0.00e+00	2.80e+06
Th-229	1.16e+08	2.92e+06	1.93e+06	0.00e+00	1.43e+07	0.00e+00	3.97e+05
Th-230	1.75e+07	8.79e+05	4.89e+05	0.00e+00	4.28e+06	0.00e+00	3.06e+05
Th-232	1.95e+07	7.50e+05	1.49e+04	0.00e+00	3.66e+06	0.00e+00	2.60e+05
Th-234	1.01e+03	4.45e+01	2.91e+01	0.00e+00	2.36e+02	0.00e+00	3.48e+05
Pa-231	3.49e+07	1.16e+06	1.39e+06	0.00e+00	6.32e+06	0.00e+00	3.64e+05
Pa-233	5.62e+01	8.76e+00	9.81e+00	0.00e+00	3.23e+01	0.00e+00	4.47e+04
U-232	8.68e+09	0.00e+00	6.22e+08	0.00e+00	6.61e+08	0.00e+00	3.44e+07
U-233	1.84e+09	0.00e+00	1.11e+08	0.00e+00	3.01e+08	0.00e+00	3.18e+07
U-234	1.76e+09	0.00e+00	1.09e+08	0.00e+00	2.95e+08	0.00e+00	3.12e+07
U-235	1.69e+09	0.00e+00	1.02e+08	0.00e+00	2.77e+08	0.00e+00	3.96e+07
U-236	1.69e+09	0.00e+00	1.05e+08	0.00e+00	2.83e+08	0.00e+00	2.92e+07
U-237	3.09e+04	0.00e+00	8.20e+03	0.00e+00	8.90e+04	0.00e+00	2.72e+06
U-238	1.61e+09	0.00e+00	9.58e+07	0.00e+00	2.59e+08	0.00e+00	2.79e+07
Np-237	1.10e+07	7.26e+05	4.83e+05	0.00e+00	2.99e+06	0.00e+00	4.03e+05

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# GOAT's MILK PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, R<sub>i</sub>

Ri factors for Child age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Gaseous Release Goat's Milk Pathway Ri

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Np-238	1.97e+01	3.98e-01	3.07e-01	0.00e+00	1.27e+00	0.00e+00	1.36e+04
Np-239	2.07e+00	1.49e-01	1.05e-01	0.00e+00	4.30e-01	0.00e+00	1.10e+04
Pu-238	2.35e+06	2.72e+05	6.24e+04	0.00e+00	2.27e+05	0.00e+00	1.48e+05
Pu-239	2.55e+06	2.72e+05	6.54e+04	0.00e+00	2.41e+05	0.00e+00	1.35e+05
Pu-240	2.53e+06	2.82e+05	6.54e+04	0.00e+00	2.41e+05	0.00e+00	1.38e+05
Pu-241	7.62e+04	3.11e+03	1.58e+03	0.00e+00	5.83e+03	0.00e+00	2.84e+03
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Pu-242	2.35e+06	2.72e+05	6.30e+04	0.00e+00	2.31e+05	0.00e+00	1.32e+05
Pu-244	2.74e+06	3.12e+06	7.21e+04	0.00e+00	2.67e+05	0.00e+00	1.97e+05
Am-241	6.65e+06	5.72e+06	4.99e+05	0.00e+00	3.05e+06	0.00e+00	3.73e+05
Am-242m	6.91e+06	5.53e+06	5.13e+05	0.00e+00	3.11e+06	0.00e+00	4.74e+05
Am-243	6.61e+06	5.58e+06	4.85e+05	0.00e+00	2.99e+06	0.00e+00	4.42e+05
Cm-242	3.96e+05	3.16e+05	2.63e+04	0.00e+00	8.43e+04	0.00e+00	3.68e+05
Cm-243	6.31e+06	5.13e+06	4.06e+05	0.00e+00	1.52e+06	0.00e+00	3.96e+05
Cm-244	5.32e+06	4.30e+06	3.41e+05	0.00e+00	1.25e+06	0.00e+00	3.83e+05
Cm-245	8.24e+06	6.61e+06	5.18e+05	0.00e+00	2.03e+06	0.00e+00	3.57e+05
Cm-246	8.14e+06	6.61e+06	5.18e+05	0.00e+00	2.02e+06	0.00e+00	3.51e+05
Cm-247	7.95e+06	6.52e+06	5.08e+05	0.00e+00	1.99e+06	0.00e+00	4.62e+05
Cm-248	6.61e+07	5.38e+07	4.21e+06	0.00e+00	1.64e+07	0.00e+00	7.45e+06
Cf-252	5.10e+06	0.00e+00	1.23e+05	0.00e+00	0.00e+00	0.00e+00	1.44e+06

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# GOAT's MILK PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, R<sub>i</sub>

Ri factors for Infant age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Gaseous Release Goat's Milk Pathway Ri

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
H-3	0.00e+00	2.78e+03	2.78e+03	2.78e+03	2.78e+03	2.78e+03	2.78e+03
Be-10	1.69e+06	2.46e+05	5.09e+04	0.00e+00	1.62e+05	0.00e+00	2.74e+06
C-14	2.34e+09	5.00e+08	5.00e+08	5.00e+08	5.00e+08	5.00e+08	5.00e+08
N-13	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
F-18	4.94e-03	0.00e+00	4.22e-04	0.00e+00	0.00e+00	0.00e+00	1.16e-03
Na-22	3.82e+09	3.82e+09	3.82e+09	3.82e+09	3.82e+09	3.82e+09	3.82e+09
Na-24	1.85e+06	1.85e+06	1.85e+06	1.85e+06	1.85e+06	1.85e+06	1.85e+06
P-32	1.92e+11	1.13e+10	7.46e+09	0.00e+00	0.00e+00	0.00e+00	2.60e+09
Ca-41	2.95e+09	0.00e+00	3.22e+08	0.00e+00	0.00e+00	0.00e+00	1.51e+06
Sc-46	1.56e+02	2.25e+02	7.03e+01	0.00e+00	1.48e+02	0.00e+00	1.47e+05
Cr-51	0.00e+00	0.00e+00	1.94e+04	1.26e+04	2.76e+03	2.46e+04	5.64e+05
Mn-54	0.00e+00	4.68e+06	1.06e+06	0.00e+00	1.04e+06	0.00e+00	1.72e+06
Mn-56	0.00e+00	3.77e-03	6.50e-04	0.00e+00	3.24e-03	0.00e+00	3.43e-01
Fe-55	1.76e+06	1.13e+06	3.03e+05	0.00e+00	0.00e+00	5.55e+05	1.44e+05
Fe-59	2.92e+06	5.10e+06	2.01e+06	0.00e+00	0.00e+00	1.51e+06	2.43e+06
Co-57	0.00e+00	1.07e+06	1.75e+06	0.00e+00	0.00e+00	0.00e+00	3.66e+06
Co-58	0.00e+00	2.91e+06	7.26e+06	0.00e+00	0.00e+00	0.00e+00	7.25e+06
Co-60	0.00e+00	1.06e+07	2.50e+07	0.00e+00	0.00e+00	0.00e+00	2.52e+07
Ni-59	3.13e+08	9.59e+07	5.40e+07	0.00e+00	0.00e+00	0.00e+00	4.74e+06
Ni-63	4.19e+09	2.59e+08	1.45e+08	0.00e+00	0.00e+00	0.00e+00	1.29e+07
Ni-65	4.27e-01	4.83e-02	2.20e-02	0.00e+00	0.00e+00	0.00e+00	3.68e+00
Cu-64	0.00e+00	2.07e+04	9.60e+03	0.00e+00	3.51e+04	0.00e+00	4.26e+05
Zn-65	6.66e+08	2.28e+09	1.05e+09	0.00e+00	1.11e+09	0.00e+00	1.93e+09
Zn-69	2.52e-12	4.54e-12	3.38e-13	0.00e+00	1.89e-12	0.00e+00	3.70e-10
Zn-69m	2.04e+05	4.17e+05	3.80e+04	0.00e+00	1.69e+05	0.00e+00	5.78e+06
Se-79	0.00e+00	9.33e+08	1.73e+08	0.00e+00	1.08e+09	0.00e+00	2.48e+07
Br-82	0.00e+00	0.00e+00	2.32e+07	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Br-83	0.00e+00	0.00e+00	1.14e-01	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Br-84	0.00e+00	0.00e+00	1.62e-23	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

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# GOAT's MILK PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, R<sub>i</sub>

R<sub>i</sub> factors for Infant age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Gaseous Release Goat's Milk Pathway R<sub>i</sub>

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Rb-86	0.00e+00	2.67e+09	1.32e+09	0.00e+00	0.00e+00	0.00e+00	6.83e+07
Rb-87	0.00e+00	2.63e+09	1.04e+09	0.00e+00	0.00e+00	0.00e+00	1.77e+07
Rb-88	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
Sr-89	2.64e+10	0.00e+00	7.58e+08	0.00e+00	0.00e+00	0.00e+00	5.43e+08
Sr-90	3.91e+11	0.00e+00	7.92e+09	0.00e+00	0.00e+00	0.00e+00	3.19e+09
Sr-91	5.73e+05	0.00e+00	2.07e+04	0.00e+00	0.00e+00	0.00e+00	6.78e+05
Sr-92	9.89e+00	0.00e+00	3.67e-01	0.00e+00	0.00e+00	0.00e+00	1.07e+02
Y-90	8.18e+01	0.00e+00	2.19e+00	0.00e+00	0.00e+00	0.00e+00	1.13e+05
Y-91	8.79e+03	0.00e+00	2.34e+02	0.00e+00	0.00e+00	0.00e+00	6.30e+05
Y-91m	7.13e-20	0.00e+00	2.43e-21	0.00e+00	0.00e+00	0.00e+00	2.38e-16
Y-92	6.52e-05	0.00e+00	1.83e-06	0.00e+00	0.00e+00	0.00e+00	1.24e+00
Y-93	2.60e-01	0.00e+00	7.08e-03	0.00e+00	0.00e+00	0.00e+00	2.05e+03
Zr-93	9.53e+02	4.54e+01	2.73e+01	0.00e+00	1.34e+02	0.00e+00	1.18e+04
Zr-95	8.16e+02	1.99e+02	1.41e+02	0.00e+00	2.14e+02	0.00e+00	9.91e+04
Zr-97	4.89e-01	8.38e-02	3.83e-02	0.00e+00	8.45e-02	0.00e+00	5.35e+03
Nb-93m	3.03e+05	8.19e+04	2.56e+04	0.00e+00	8.00e+04	0.00e+00	9.79e+06
Nb-95	7.12e+04	2.93e+04	1.70e+04	0.00e+00	2.10e+04	0.00e+00	2.48e+07
Nb-97	7.39e-12	1.58e-12	5.68e-13	0.00e+00	1.23e-12	0.00e+00	4.97e-07
Mo-93	0.00e+00	4.18e+08	1.35e+07	0.00e+00	8.37e+07	0.00e+00	8.96e+06
Mo-99	0.00e+00	2.50e+07	4.87e+06	0.00e+00	3.73e+07	0.00e+00	8.23e+06
Tc-101	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Tc-99	2.67e+07	3.60e+07	1.12e+07	0.00e+00	3.04e+08	3.50e+06	1.56e+08
Tc-99m	3.32e+00	6.84e+00	8.82e+01	0.00e+00	7.36e+01	3.58e+00	1.99e+03
Ru-103	1.04e+03	0.00e+00	3.48e+02	0.00e+00	2.17e+03	0.00e+00	1.27e+04
Ru-105	9.75e-04	0.00e+00	3.28e-04	0.00e+00	7.17e-03	0.00e+00	3.88e-01
Ru-106	2.28e+04	0.00e+00	2.85e+03	0.00e+00	2.70e+04	0.00e+00	1.73e+05
Rh-105	3.98e+05	2.60e+05	1.75e+05	0.00e+00	7.23e+05	0.00e+00	6.47e+06
Pd-107	0.00e+00	1.17e+07	8.34e+05	0.00e+00	6.70e+07	0.00e+00	9.34e+06
Pd-109	0.00e+00	4.86e+04	1.17e+04	0.00e+00	1.79e+05	0.00e+00	1.19e+06

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# GOAT's MILK PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, R<sub>i</sub>

R<sub>i</sub> factors for Infant age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Gaseous Release Goat's Milk Pathway R<sub>i</sub>

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Ag-110m	4.63e+07	3.38e+07	2.24e+07	0.00e+00	4.83e+07	0.00e+00	1.75e+09
Ag-111	7.40e+06	2.88e+06	1.52e+06	0.00e+00	6.01e+06	0.00e+00	6.86e+08
Cd-113m	0.00e+00	2.09e+06	7.70e+04	0.00e+00	1.58e+06	0.00e+00	3.14e+06
Cd-115m	0.00e+00	1.24e+06	4.31e+04	0.00e+00	6.48e+05	0.00e+00	7.07e+06
Sn-123	5.48e+08	8.57e+06	1.43e+07	8.61e+06	0.00e+00	0.00e+00	1.45e+08
Sn-125	6.45e+07	1.20e+06	2.86e+06	1.18e+06	0.00e+00	0.00e+00	9.66e+07
Sn-126	1.36e+09	1.79e+07	4.44e+07	4.71e+06	0.00e+00	0.00e+00	6.22e+07
Sb-124	2.51e+07	3.70e+05	7.78e+06	6.67e+04	0.00e+00	1.57e+07	7.75e+07
Sb-125	1.79e+07	1.74e+05	3.69e+06	2.25e+04	0.00e+00	1.04e+07	2.39e+07
Sb-126	5.04e+06	9.88e+04	1.82e+06	3.87e+04	0.00e+00	3.17e+06	5.22e+07
Sb-127	5.01e+05	8.93e+03	1.55e+05	6.37e+03	0.00e+00	2.58e+05	1.33e+07
Te-125m	1.81e+07	6.05e+06	2.45e+06	6.09e+06	0.00e+00	0.00e+00	8.62e+06
Te-127	7.61e+02	2.55e+02	1.64e+02	6.20e+02	1.86e+03	0.00e+00	1.60e+04
Te-127m	5.05e+07	1.68e+07	6.12e+06	1.46e+07	1.24e+08	0.00e+00	2.04e+07
Te-129	3.37e-10	1.16e-10	7.87e-11	2.83e-10	8.40e-10	0.00e+00	2.70e-08
Te-129m	6.69e+07	2.29e+07	1.03e+07	2.57e+07	1.67e+08	0.00e+00	3.99e+07
Te-131	4.51e-33	1.67e-33	1.27e-33	4.02e-33	1.15e-32	0.00e+00	1.82e-31
Te-131m	4.06e+05	1.63e+05	1.35e+05	3.31e+05	1.12e+06	0.00e+00	2.75e+06
Te-132	2.53e+06	1.25e+06	1.17e+06	1.85e+06	7.84e+06	0.00e+00	4.64e+06
Te-133m	2.37e-13	1.09e-13	1.04e-13	2.09e-13	7.40e-13	0.00e+00	1.17e-11
Te-134	9.91e-19	4.97e-19	5.12e-19	8.87e-19	3.35e-18	0.00e+00	1.14e-17
I-129	8.47e+08	6.28e+08	4.59e+08	4.03e+11	7.43e+08	0.00e+00	1.26e+07
I-130	4.27e+05	9.40e+05	3.77e+05	1.05e+08	1.03e+06	0.00e+00	2.01e+05
I-131	3.26e+08	3.85e+08	1.69e+08	1.26e+11	4.49e+08	0.00e+00	1.37e+07
I-132	1.74e-01	3.54e-01	1.26e-01	1.66e+01	3.95e-01	0.00e+00	2.87e-01
I-133	4.36e+06	6.35e+06	1.86e+06	1.15e+09	7.46e+06	0.00e+00	1.07e+06
I-134	2.21e-12	4.52e-12	1.61e-12	1.05e-10	5.05e-12	0.00e+00	4.67e-12
I-135	1.36e+04	2.70e+04	9.83e+03	2.42e+06	3.00e+04	0.00e+00	9.76e+03
Cs-134	1.09e+11	2.04e+11	2.06e+10	0.00e+00	5.25e+10	2.15e+10	5.54e+08
Cs-134m	4.64e+00	7.73e+00	3.90e+00	0.00e+00	2.98e+00	6.86e-01	6.12e+00

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# GOAT's MILK PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, R<sub>i</sub>

R<sub>i</sub> factors for Infant age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Gaseous Release Goat's Milk Pathway R<sub>i</sub>

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Cs-135	3.94e+10	3.58e+10	1.87e+09	0.00e+00	1.02e+10	3.88e+09	1.29e+08
Cs-136	5.93e+09	1.74e+10	6.51e+09	0.00e+00	6.95e+09	1.42e+09	2.65e+08
Cs-137	1.54e+11	1.81e+11	1.28e+10	0.00e+00	4.85e+10	1.96e+10	5.65e+08
Cs-138	2.70e-22	4.40e-22	2.13e-22	0.00e+00	2.19e-22	3.42e-23	7.03e-22
Cs-139	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Ba-139	5.27e-08	3.49e-11	1.53e-09	0.00e+00	2.10e-11	2.12e-11	3.34e-06
Ba-140	2.89e+07	2.89e+04	1.49e+06	0.00e+00	6.87e+03	1.78e+04	7.10e+06
Ba-141	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	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
La-140	4.87e+00	1.92e+00	4.94e-01	0.00e+00	0.00e+00	0.00e+00	2.25e+04
La-141	3.47e-05	1.01e-05	1.75e-06	0.00e+00	0.00e+00	0.00e+00	1.15e+00
La-142	2.09e-11	7.67e-12	1.84e-12	0.00e+00	0.00e+00	0.00e+00	1.30e-06
Ce-141	5.20e+03	3.17e+03	3.74e+02	0.00e+00	9.79e+02	0.00e+00	1.64e+06
Ce-143	4.77e+01	3.16e+04	3.61e+00	0.00e+00	9.21e+00	0.00e+00	1.85e+05
Ce-144	2.79e+05	1.14e+05	1.56e+04	0.00e+00	4.62e+04	0.00e+00	1.60e+07
Pr-143	1.78e+02	6.67e+01	8.84e+00	0.00e+00	2.48e+01	0.00e+00	9.41e+04
Pr-144	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Nd-147	1.06e+02	1.09e+02	6.65e+00	0.00e+00	4.19e+01	0.00e+00	6.88e+04
Pm-147	1.88e+03	1.59e+02	7.72e+01	0.00e+00	2.37e+02	0.00e+00	4.50e+04
Pm-148	6.68e+01	9.65e+00	4.86e+00	0.00e+00	1.15e+01	0.00e+00	1.03e+05
Pm-148m	5.88e+02	1.49e+02	1.17e+02	0.00e+00	1.71e+02	0.00e+00	1.94e+05
Pm-149	4.96e+00	6.50e-01	2.84e-01	0.00e+00	7.91e-01	0.00e+00	1.75e+04
Pm-151	7.32e-01	1.07e-01	5.40e-02	0.00e+00	1.27e-01	0.00e+00	4.94e+03
Sm-151	1.43e+03	3.29e+02	7.10e+01	0.00e+00	2.24e+02	0.00e+00	2.75e+04
Sm-153	2.29e+00	1.77e+00	1.36e-01	0.00e+00	3.71e-01	0.00e+00	9.25e+03
Eu-152	3.32e+03	8.81e+02	7.43e+02	0.00e+00	2.47e+03	0.00e+00	7.82e+04
Eu-154	1.30e+04	1.81e+03	1.09e+03	0.00e+00	4.91e+03	0.00e+00	2.26e+05
Eu-155	2.61e+03	3.01e+02	1.56e+02	0.00e+00	6.75e+02	0.00e+00	4.04e+05
Eu-156	2.67e+02	1.66e+02	2.63e+01	0.00e+00	7.65e+01	0.00e+00	1.56e+05
Tb-160	1.05e+03	0.00e+00	1.31e+02	0.00e+00	2.99e+02	0.00e+00	1.40e+05

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# GOAT's MILK PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, R<sub>i</sub>

Ri factors for Infant age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Gaseous Release Goat's Milk Pathway Ri

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Ho-166m	6.17e+03	1.33e+03	1.05e+03	0.00e+00	1.76e+03	0.00e+00	1.31e+05
W-181	3.87e+04	1.19e+04	1.33e+03	0.00e+00	0.00e+00	0.00e+00	1.67e+05
W-185	1.48e+06	4.62e+05	5.27e+04	0.00e+00	0.00e+00	0.00e+00	6.62e+06
W-187	7.31e+03	5.08e+03	1.76e+03	0.00e+00	0.00e+00	0.00e+00	2.99e+05
Pb-210	3.23e+10	8.67e+09	1.45e+09	0.00e+00	2.64e+10	0.00e+00	1.42e+06
Bi-210	4.10e+05	2.64e+06	2.36e+05	0.00e+00	2.05e+07	0.00e+00	5.20e+06
Po-210	8.25e+08	1.58e+09	1.97e+08	0.00e+00	3.35e+09	0.00e+00	1.76e+07
Ra-223	1.38e+11	2.02e+08	2.77e+10	0.00e+00	3.67e+09	0.00e+00	1.08e+09
Ra-224	1.64e+10	3.69e+07	3.26e+09	0.00e+00	6.72e+08	0.00e+00	4.33e+08
Ra-225	2.14e+11	2.41e+08	4.25e+10	0.00e+00	4.40e+09	0.00e+00	1.20e+09
Ra-226	4.90e+12	3.76e+08	4.06e+12	0.00e+00	6.88e+09	0.00e+00	2.72e+09
Ra-228	3.39e+12	2.02e+08	3.81e+12	0.00e+00	3.71e+09	0.00e+00	4.59e+08
Ac-225	7.02e+04	9.01e+04	4.71e+03	0.00e+00	6.61e+03	0.00e+00	7.81e+05
Ac-227	2.21e+07	3.78e+06	1.37e+06	0.00e+00	7.69e+05	0.00e+00	4.19e+05
Th-227	3.13e+05	5.24e+03	8.99e+03	0.00e+00	1.93e+04	0.00e+00	1.49e+06
Th-228	1.19e+07	1.63e+05	4.04e+05	0.00e+00	7.63e+05	0.00e+00	2.82e+06
Th-229	1.24e+08	3.12e+06	2.07e+06	0.00e+00	1.50e+07	0.00e+00	4.00e+05
Th-230	1.88e+07	9.38e+05	5.23e+05	0.00e+00	4.50e+06	0.00e+00	3.08e+05
Th-232	2.09e+07	8.05e+05	8.14e+03	0.00e+00	3.85e+06	0.00e+00	2.62e+05
Th-234	2.04e+03	1.11e+02	5.90e+01	0.00e+00	4.10e+02	0.00e+00	3.51e+05
Pa-231	3.74e+07	1.23e+06	1.49e+06	0.00e+00	6.61e+06	0.00e+00	3.67e+05
Pa-233	9.66e+01	1.89e+01	1.69e+01	0.00e+00	5.19e+01	0.00e+00	4.53e+04
U-232	1.19e+10	0.00e+00	1.07e+09	0.00e+00	1.17e+09	0.00e+00	3.47e+07
U-233	2.51e+09	0.00e+00	1.91e+08	0.00e+00	5.33e+08	0.00e+00	3.21e+07
U-234	2.41e+09	0.00e+00	1.88e+08	0.00e+00	5.23e+08	0.00e+00	3.14e+07
U-235	2.31e+09	0.00e+00	1.76e+08	0.00e+00	4.90e+08	0.00e+00	4.00e+07
U-236	2.31e+09	0.00e+00	1.80e+08	0.00e+00	4.99e+08	0.00e+00	2.95e+07
U-237	6.47e+04	0.00e+00	1.73e+04	0.00e+00	1.61e+05	0.00e+00	2.76e+06
U-238	2.21e+09	0.00e+00	1.64e+08	0.00e+00	4.58e+08	0.00e+00	2.82e+07
Np-237	1.18e+07	7.85e+05	5.18e+05	0.00e+00	3.13e+06	0.00e+00	4.06e+05

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.



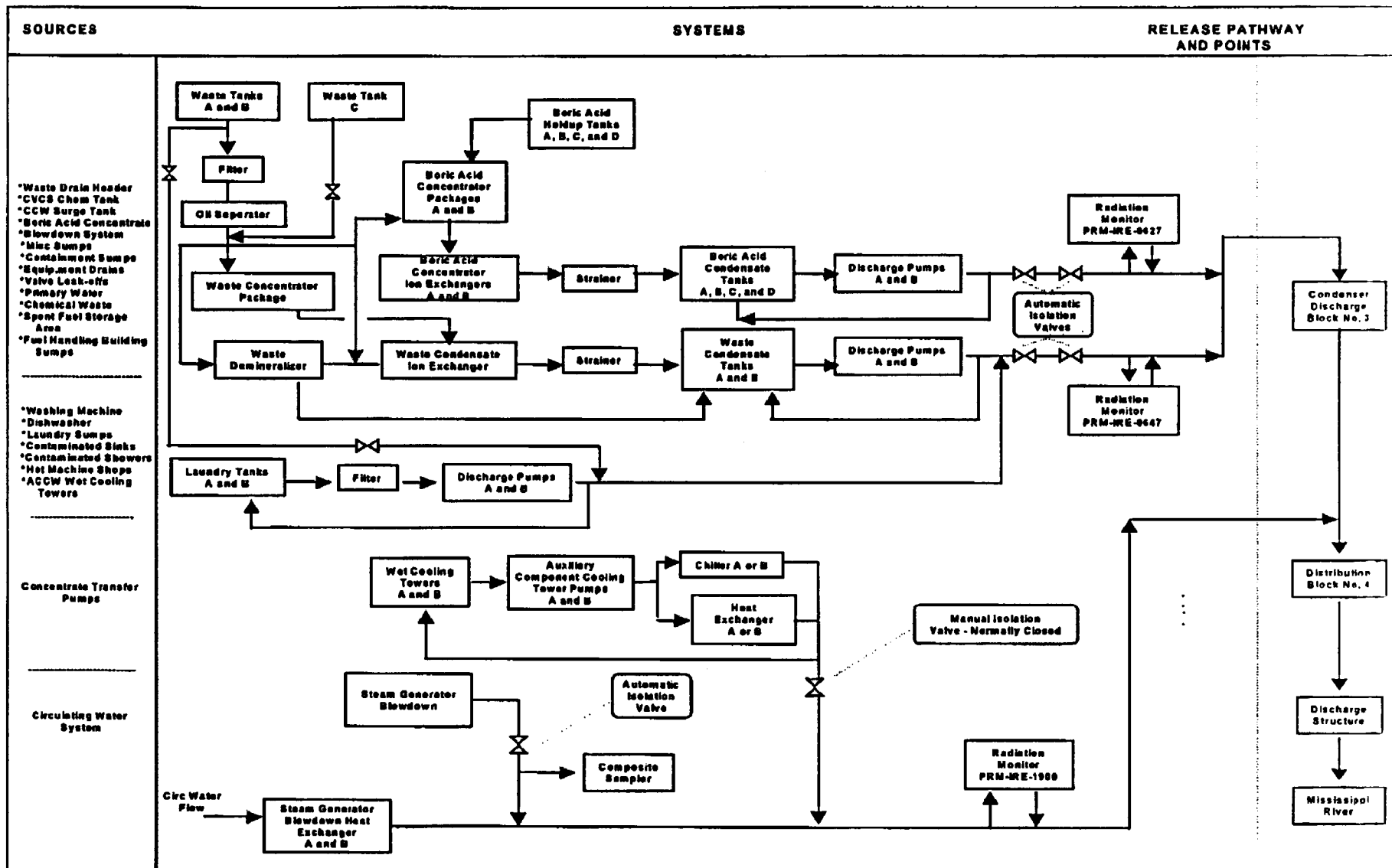
# GOAT's MILK PATHWAY DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES, R<sub>i</sub>

R<sub>i</sub> factors for Infant age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Gaseous Release Goat's Milk Pathway R<sub>i</sub>

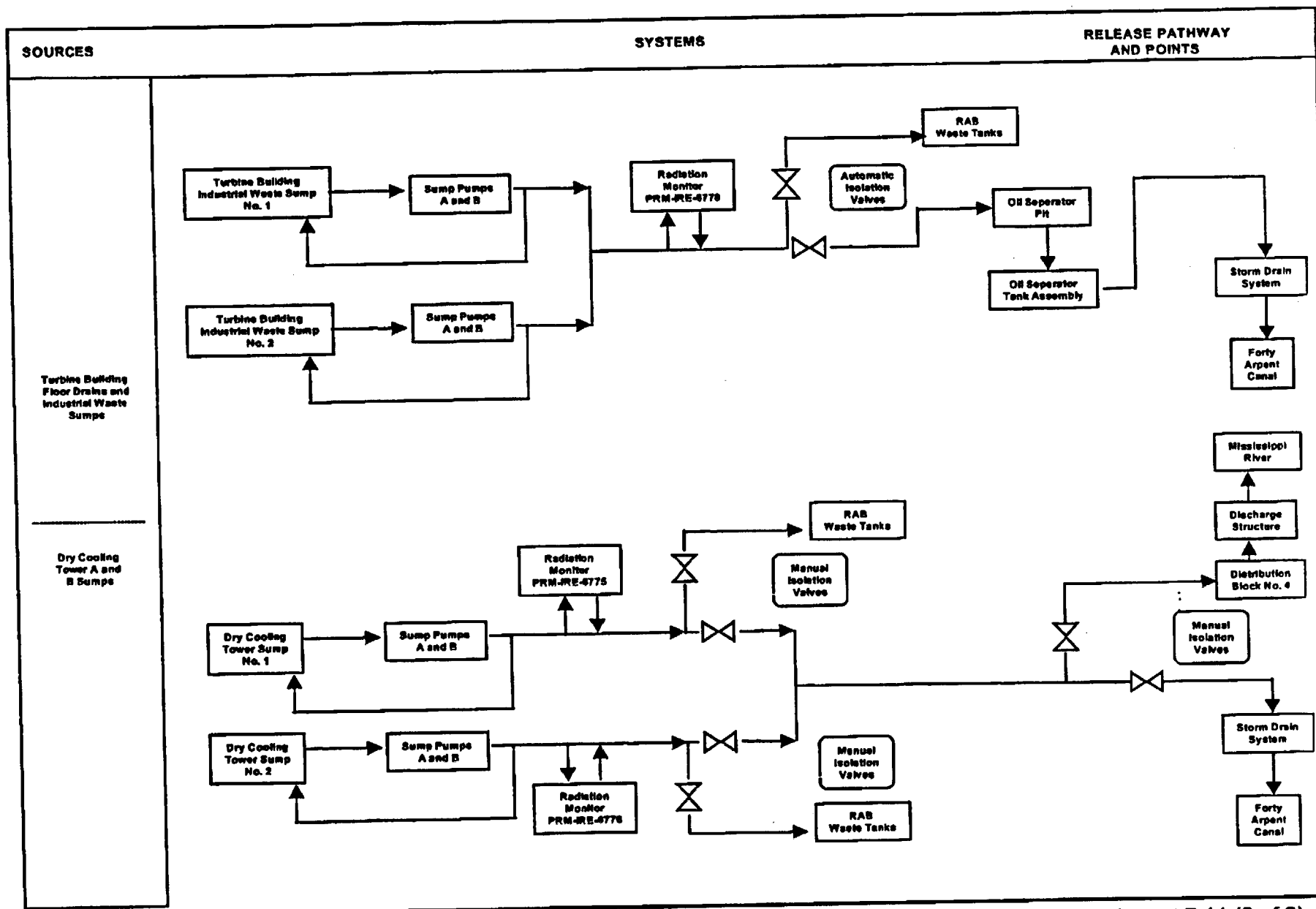
Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Np-238	4.19e+01	1.05e+00	6.48e-01	0.00e+00	2.30e+00	0.00e+00	1.41e+04
Np-239	4.38e+00	3.92e-01	2.21e-01	0.00e+00	7.81e-01	0.00e+00	1.13e+04
Pu-238	2.53e+06	2.96e+05	6.71e+04	0.00e+00	2.39e+05	0.00e+00	1.49e+05
Pu-239	2.72e+06	3.06e+05	6.99e+04	0.00e+00	2.53e+05	0.00e+00	1.36e+05
Pu-240	2.72e+06	3.06e+05	6.99e+04	0.00e+00	2.53e+05	0.00e+00	1.39e+05
Pu-241	8.37e+04	3.47e+03	1.74e+03	0.00e+00	6.24e+03	0.00e+00	2.86e+03
Pu-242	2.53e+06	2.94e+05	6.73e+04	0.00e+00	2.43e+05	0.00e+00	1.34e+05
Pu-244	2.94e+06	3.38e+05	7.72e+04	0.00e+00	2.78e+05	0.00e+00	1.99e+05
Am-241	7.14e+06	6.21e+06	5.33e+05	0.00e+00	3.20e+06	0.00e+00	3.76e+05
Am-242m	7.45e+06	6.02e+06	5.58e+05	0.00e+00	3.28e+06	0.00e+00	4.78e+05
Am-243	7.11e+06	6.07e+06	5.23e+05	0.00e+00	3.14e+06	0.00e+00	4.46e+05
Cm-242	6.17e+05	5.72e+05	4.10e+04	0.00e+00	1.18e+05	0.00e+00	3.71e+05
Cm-243	6.90e+06	5.67e+06	4.43e+05	0.00e+00	1.61e+06	0.00e+00	3.99e+05
Cm-244	5.81e+06	4.78e+06	3.74e+05	0.00e+00	1.33e+06	0.00e+00	3.86e+05
Cm-245	8.84e+06	7.16e+06	5.58e+05	0.00e+00	2.13e+06	0.00e+00	3.60e+05
Cm-246	8.74e+06	7.16e+06	5.58e+05	0.00e+00	2.13e+06	0.00e+00	3.54e+05
Cm-247	8.54e+06	7.06e+06	5.48e+05	0.00e+00	2.09e+06	0.00e+00	4.65e+05
Cm-248	7.06e+07	5.82e+07	4.52e+06	0.00e+00	1.73e+07	0.00e+00	7.50e+06
Cf-252	5.92e+06	0.00e+00	1.43e+05	0.00e+00	0.00e+00	0.00e+00	1.45e+06

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

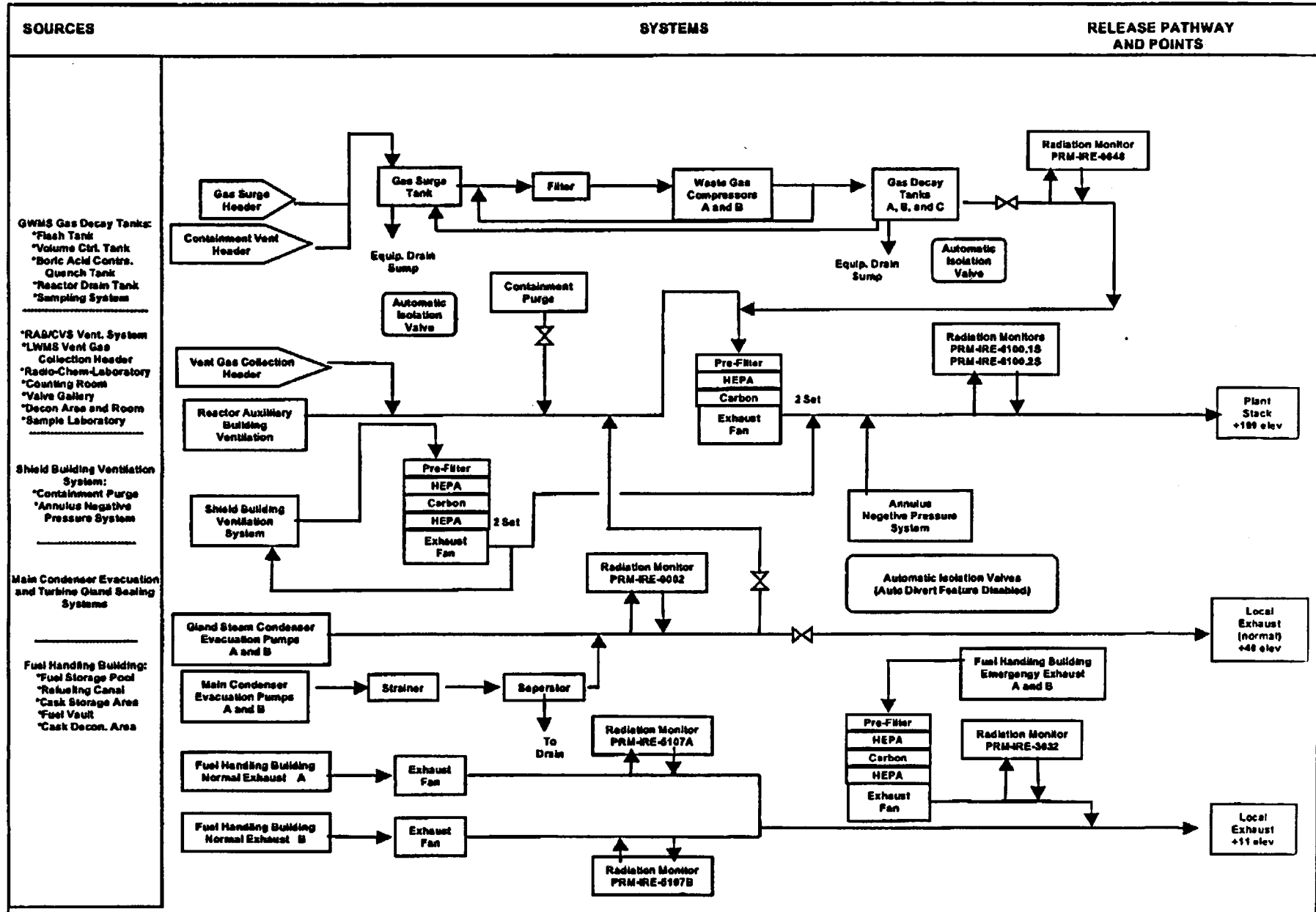
# LIQUID WASTE MANAGEMENT SYSTEM EFFLUENT SOURCES AND RELEASE PATHWAYS AND POINTS



# LIQUID WASTE MANAGEMENT SYSTEM EFFLUENT SOURCES AND RELEASE PATHWAYS AND POINTS



# GASEOUS EFFLUENT SOURCES, GASEOUS WASTE MANAGEMENT SYSTEM EFFLUENT SOURCES AND EXHAUST RELEASE POINTS



## RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

SAMPLE	LOCATION	ANALYSIS	FREQUENCY*	VOLUME
TLD	A-2, B-1, C-1, D-2, E-1, F-2, G-2, H-2, J-2, K-1, L-1, M-1, N-1, P-1, Q-1, R-1, A-5, B-4, D-5, E-5 F-4, G-4, H-8, P-6, Q-5 R-6, F-9, G-8, E-15, J-15 E-30	TLD <sup>(1)</sup>	Quarterly	N/A
Radioiodine and Particulates	APP-1, APQ-1, APF-1, APC-1, APE-30	Gross beta <sup>(2)</sup> , I-131	Bi-Weekly	285m <sup>3</sup> /wk
		$\gamma$ isotopic <sup>(2)</sup>	Quarterly composite	3700m <sup>3</sup> /qtr
Ground Water	NONE	NONE	NONE	NONE
Drinking Water/ Surface Water <sup>(3)</sup>	DWF-2 <sup>(4)</sup> /SWF-2 <sup>(4)</sup> DWP-7/SWP-7 DWE-5 <sup>(4)</sup> /SWE-5 <sup>(4)</sup> SWK-1	H-3	Quarterly composite <sup>(5)</sup>	Homogeneous 8 liters
		Gross beta, $\gamma$ isotopic	Quarterly composite <sup>(5)</sup>	
		I-131 <sup>(7)</sup>	Monthly composite <sup>(10)</sup>	
Shoreline Sediment	SHWE-3, SHWK-1, SHWQ-6	$\gamma$ isotopic	Annually	2 Kilograms
Milk	MKQ-5, MKR-40	$\gamma$ isotopic, I-131	Quarterly	8 liters
Fish	FH-1, FH-2, FH-3	$\gamma$ isotopic	In season or Annually <sup>(9)</sup>	500 grams
Broad Leaf	BLQ-1, BLB-1, BLE-20	$\gamma$ isotopic, I-131	Quarterly	500 grams
Sanitary System <sup>(11)</sup>	SWR-1	$\gamma$ isotopic	Monthly Composite <sup>(10)</sup>	Homogeneous 1 Liter

\*Sample collection at specific locations may be increased at any time in order to increase the effectiveness of the REMP program.

## **RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM**

1. One or more instrument, such as a pressurized ion chamber, for measuring and recording dose rate continuously may be used in place of, or in addition to, integrating dosimeters. A TLD is considered one phosphor, two or more phosphors in a packet are considered two or more dosimeters. Geographical limitations affect siting of dosimeters.
2. Airborne particulate sample filters shall be analyzed for gross beta radioactivity 24 hours or more after sampling to allow for radon and thoron daughter decay. If gross beta activity in air particulate samples is greater than ten times the yearly mean of control samples, gamma isotopic analysis shall be performed on the individual samples. Gamma isotopic analysis means the identification and quantification of gamma-emitting radionuclides that may be attributable to the effluents from the facility.
3. Drinking Water and Surface Water samples are identical where designated.
4. The downstream sample is beyond the mixing zone.
5. A composite sample will contain aliquots of sample taken proportional to the quantity of flowing liquid that results in a specimen representative of the liquid flow.
6. DELETED
7. This analysis will be performed when the dose calculated for the consumption of water is greater than 1 mrem per year as calculated for maximum organ and age group.
8. DELETED
9. Striped mullet, gizzard shad, freshwater drum, and catfish will be collected. If they are not available, then substitute species will be collected and identified in reporting.

## **RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM**

10. An analysis frequency of every 4 weeks satisfies this requirement. The maximum frequency is monthly.
11. Sanitary System Sampling and analysis performed additionally for this location. This sampling requirement is not derived directly from REMP requirements, but it represents another possible environmental interface with the plant. Information from this sample location will not normally be included in the Annual Radiological Environmental Operating Report.

# RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

SAMPLE LOCATION TABLE

LOCATION NUMBER	LOCATION DESCRIPTION	BEARING/ MILES TO PLANT	Position Latitude Longitude
	<b>DIRECT RADIATION (TLD)</b>		
A-2	(Eastbank) Located on a utility pole on LA 628 near the Zephirin L. Periloux Fire House.	188° 1.27	N 30.01381 W 90.46780
B-1	(Eastbank) On fence enclosing the transmission tower 0.3 miles west (up river) from Little Gypsy on LA 628.	200° 0.75	N 30.00576 W 90.46672
C-1	(Eastbank) On fence enclosing the Little Gypsy Cooling Water Intake on LA 628 near APC-1.	219° 0.67	N 30.00307 W 90.46401
D-2	(Eastbank) Located approximately 0.3 miles east of Little Gypsy Power Station on stop sign post located at the peak of the levee on the west entrance road through the Bonnet Carre Spillway.	238° 1.24	N 30.00471 W 90.45343



# RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

SAMPLE LOCATION TABLE (Continued)

LOCATION NUMBER	LOCATION DESCRIPTION	BEARING/ MILES TO PLANT	Position Latitude Longitude
	<b><u>DIRECT RADIATION (TLD) (continued)</u></b>		
E-1	(Westbank) Located on utility pole along LA 18 approximately 0.3 miles east of Waterford 3 plant entrance.	277° 0.41	N 29.99468 W 90.46437
F-2	(Westbank) Located on southeast corner of fence enclosure surrounding the Entergy substation, 0.2 miles south of LA 18 on LA 3142.	294° 1.15	N 29.98842 W 90.45387
G-2	(Westbank) Located on fence east of LA 3142 approximately 0.3 miles north of railroad overpass.	309° 1.26	N 29.98371 W 90.45498
H-2	(Westbank) Located off LA 3142 on southwest edge of fence along shell road 0.4 miles north of LA 3127/3142 intersection.	327° 1.54	N 29.97659 W 90.45753

# RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

SAMPLE LOCATION TABLE (Continued)

LOCATION NUMBER	LOCATION DESCRIPTION	BEARING/ MILES TO PLANT	Position Latitude Longitude
	<b><u>DIRECT RADIATION (TLD) (continued)</u></b>		
J-2	(Westbank) Located on fence enclosure for valve station south of LA 3127 approxmiately 0.6 miles west of LA 3127/3142 intersection.	356° 1.38	N 29.97546 W 90.47003
K-1	(Westbank) Located on stop sign at entrance to Entergy Education Center on LA 3127.	23° 1.06	N 29.98153 W 90.47843
L-1	(Westbank) Located on gated entrance off of LA 3127, approximately 1.6 miles west of LA 3127/3142 intersection.	42° 1.06	N 29.98427 W 90.48314
M-1	(Westbank) Located on south gate of the Waterford 1 and 2 fuel oil storage tank enclosure.	67° 0.76	N 29.99148 W 90.48286
N-1	(Westbank) Located on pole at corner of Railroad Ave. and School House Road.	93° 0.98	N 29.99649 W 90.48739

# RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

SAMPLE LOCATION TABLE (Continued)

LOCATION NUMBER	LOCATION DESCRIPTION	BEARING/ MILES TO PLANT	Position Latitude Longitude
	<b><u>DIRECT RADIATION (TLD) (continued)</u></b>		
P-1	(Westbank) Located on fence enclosing air sample station APP-1.	119° 0.84	N 30.00158 W 90.48323
Q-1	(Westbank) Located on fence enclosing air sample station APQ-1.	132° 0.81	N 30.00355 W 90.48091
R-1	(Westbank) Located at Waterford 1 and 2 Cooling Water Intake Structure on east hand-rail approximately a quarter of the way down the catwalk.	147° 0.51	N 30.00181 W 90.47564
A-5	(Eastbank) Located on utility pole at intersection of Oswald Avenue and US 61.	177° 4.59	N 30.06212 W 90.47334
B-4	(Eastbank) Located on utility pole guidewire next to transmission tower south of weigh station on US 61 at St. John/ St. Charles Parish line.	197° 3.75	N 30.04717 W 90.45130

# RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

SAMPLE LOCATION TABLE (Continued)

LOCATION NUMBER	LOCATION DESCRIPTION	BEARING/ MILES TO PLANT	Position Latitude Longitude
	<u><b>DIRECT RADIATION (TLD) (continued)</b></u>		
D-5	(Eastbank) Located on gate on shell road approximately 0.1 miles north of US 61/LA 48 intersection.	249° 4.09	N 30.01628 W 90.40730
E-5	(Eastbank) Located on the Norco Substation fence enclosure at the end of Wesco St. off of LA 48.	266° 4.08	N 29.99840 W 90.40314
F-4	(Westbank) Located on utility pole behind house at 646 Aquarius St. in Hahnville.	289° 3.53	N 29.97818 W 90.41582
G-4	(Westbank) Located on railroad sign on LA 3160 approximately 0.1 miles north of railroad track.	309° 3.30	N 29.96507 W 90.42867

# RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

SAMPLE LOCATION TABLE (Continued)

LOCATION NUMBER	LOCATION DESCRIPTION	BEARING/ MILES TO PLANT	Position Latitude Longitude
H-8	<b><u>DIRECT RADIATION (TLD) (continued)</u></b> (Westbank) Located on a road sign on south side of HWY 90 directly in front of Hahnville High School approximately 0.1 miles east of Tiger Dr..	331° 8.13	N 29.89178 W 90.40725
P-6	(Westbank) Located on a fence surrounding the communications tower at the LA 640/railroad track intersection.	107° 5.58	N 30.02121 W 90.55941
Q-5	(Westbank) Located on utility pole along LA 18 across from Mississippi River marker 137.	129° 5.01	N 30.04274 W 90.53464
R-6	(Eastbank) Located on fence enclosure approximately 0.2 miles west of US 61 on LA 3223 near railroad crossing.	160° 5.52	N 30.07108 W 90.50183
F-9	(Eastbank) Located on entrance gate to Destrehan Substation just north of railroad tracks on Jonathan St.. Johnathan St. is approximately 1.5 miles east of Luling-Destrehan Bridge, off of LA 48.	294° 8.18	N 29.94563 W 90.34739

# RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

SAMPLE LOCATION TABLE (Continued)

LOCATION NUMBER	LOCATION DESCRIPTION	BEARING/ MILES TO PLANT	Position Latitude Longitude
	<u>DIRECT RADIATION (TLD) (continued)</u> . . . .		
G-8	(Westbank) Located on southern most corner of the back fence of Entergy Office in Luling.	305° 7.74	N 29.93055 W 90.36592
E-15	(Eastbank) Located on Kenner Substation fence enclosure on Alliance Ave. approximately 0.1 miles from LA 48.	275° 11.7	N 29.97695 W 90.27658
J-15	(Westbank) Located on utility pole near the LA 631/Hwy 90 intersection in Des Allemands.	357° 11.7	N 29.82575 W 90.46457
E-30*	(Westbank) Located at entrance to the Entergy Office on Delaronde St. in Algiers.	276° 25.2	N 29.95233 W 90.05441

\* DENOTES CONTROL LOCATIONS

# RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

SAMPLE LOCATION TABLE (Continued)

LOCATION NUMBER	LOCATION DESCRIPTION	BEARING/ MILES TO PLANT	Position Latitude Longitude
	<b>AIRBORNE</b>		
APP-1	(Westbank) Located in soybean/sugarcane field at northwest corner of Short St. in Killona.	119° 0.84	N 30.00158 W 90.48323
APQ-1	(Westbank) Located in soybean/sugarcane field off LA 18 approximately 0.6 miles east of LA 18/3141 intersection.	132° 0.81	N 30.00356 W 90.48093
APF-1	(Westbank) Located on north side of Secondary Meteorological Tower.	299° 0.35	N 29.99302 W 90.46601
APC-1	(Eastbank) Located inside the Little Gypsy Cooling Water Intake Structure fence enclosure.	219° 0.67	N 30.00307 W 90.46401
APE-30*	(Westbank) Located on the roof of the Energy Office building on Delaronde St. in Algiers.	276° 25.2	N 29.95289 W 90.05430

\* DENOTES CONTROL LOCATIONS

# RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

SAMPLE LOCATION TABLE (Continued)

LOCATION NUMBER	LOCATION DESCRIPTION	BEARING/ MILES TO PLANT	Position Latitude Longitude
	<b><u>BROAD LEAF</u></b>		
BLQ-1	(Westbank) Located near air sample station APQ-1.	132° 0.83	N 30.00367 W 90.48132
BLB-1	(Eastbank) Located near transmission tower west of Little Gypsy on LA 628.	197° 0.81	N 30.00665 W 90.46691
BLE-20*	(Westbank) Located on property of Nine Mile Point in Westwego, LA.	280° 19.7	N 29.94142 W 90.14909

\* DENOTES CONTROL LOCATION(S)



# RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

SAMPLE LOCATION TABLE (Continued)

LOCATION NUMBER	LOCATION DESCRIPTION	BEARING/ MILES TO PLANT	Position Latitude Longitude
	<b>INGESTION</b>		
	<b>MILK</b>		
MKQ-5	(Westbank) Located at the Webre's house on LA 18 across from Mississippi River marker 137.	129° 4.99	N 30.04224 W 90.53467
MKQ-40*	(Eastbank) Located at 24254 LA Hwy 442, Holden, LA.	166° 40.7	N 30.57102 W 90.62381
	<b>FISH</b>		
FH-1*	Upstream of the plant intake structure.	N/A	N/A
FH-2	Downstream of the plant discharge structure.	N/A	N/A
FH-3	(Westbank) Waterways downstream of plant discharge directed to 40 Arpent Canal.	N/A	N/A

\* DENOTES CONTROL LOCATIONS

N/A - Not Applicable for this sampling location.

# RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

SAMPLE LOCATION TABLE (Continued)

LOCATION NUMBER	LOCATION DESCRIPTION	BEARING/ MILES TO PLANT	Position Latitude Longitude
	<u>WATERBORNE</u>		
SWK-1	(Westbank) Located at 40 Arpent Canal south of the plant. The canal is northwest of the shell access road/railroad track intersection.	14° 0.49	N 29.98866 W 90.47324
SHWE-3	(Westbank) Located at Foot Ferry Landing off LA 18 in Taft.	276° 2.99	N 29.99063 W 90.42151
SHWK-1	(Westbank) Located at 40 Arpent Canal south of plant. The canal is northwest of the shell access road/railroad track intersection.	14° 0.49	N 29.98866 W 90.47324
SHWQ-6*	(Eastbank) Located off LA 628 approximately 0.1 miles east of Reserve ferry landing.	129° 5.99	N 30.05154 W 90.54748
DWE-5 SWE-5	(Eastbank) Located at St. Charles Parish Waterworks off LA 48 in New Sarpy.	277° 4.59	N 29.98622 W 90.39525
DWP-7* SWP-7*	(Westbank) Located at St. John Parish Waterworks off LA 18 in Edgard.	117° 7.37	N 30.04629 W 90.57931
DWF-2 SWF-2	(Westbank) Located Dow Chemical Plant drinking water canal.	302° 1.51	N 29.98371 W 90.44989

\* DENOTES CONTROL LOCATIONS

# RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

SAMPLE LOCATION TABLE (Continued)

LOCATION NUMBER	LOCATION DESCRIPTION	BEARING/ MILES TO PLANT	Position Latitude Longitude
	<b>SANITARY SYSTEM</b>		
SWR-1**	Sewage lift station NW of MSB between Protected Area Fence and LA 18 0.1 miles from the plant.	153° 0.10	N 29.99684 W 90.47184

\*\* Sampling requirements are not derived directly from REMP requirements therefore results will not appear in the annual report. However, it represents another possible environmental interface with the plant.

# RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

## SECTOR AND ZONE DESIGNATORS FOR RADIOLOGICAL SAMPLING AND MONITORING POINTS

SECTOR NOMENCLATURE		ZONE NOMENCLATURE	
CENTERLINE OF SECTOR IN DEGREES TRUE NORTH FROM FACILITY	22 1/2° SECTOR	MILES FROM FACILITY	ZONE
0 & 360	*A N	0-1	1
22 1/2	B NNE	1-2	2
45	C NE	2-3	3
67 1/2	D ENE	3-4	4
90	E E	4-5	5
112 1/2	F ESE	5-6	6
135	G SE	6-7	7
157 1/2	H OR SSE	7-8	8
180	J S	8-9	9
202 1/2	K SSW	9-10	10
225	L SW	10-15	15
247 1/2	M WSW	15-20	20
270	N W	20-25	25
292 1/2	P WNW	25-30	30
315	Q NW	30-35	35
337 1/2	R NNW	35-40	40
		40-45	45
		45-50	50

**AREA SEGMENT -** An area is identified by a Sector and Zone designator. Thus, area N-1 is that area which lies between 348 3/4 and 11 1/4 degrees true north from the facility out to a radius of 1 mile. Area G-4 would be that area between 123 3/4 to 146 1/4 degrees and the 3- and 4-mile arcs from the facility. For Airborne, Ingestion (milk), and Food Products pathways, the sector designator will be preceded by acronyms AP, MK, and FP, respectively.

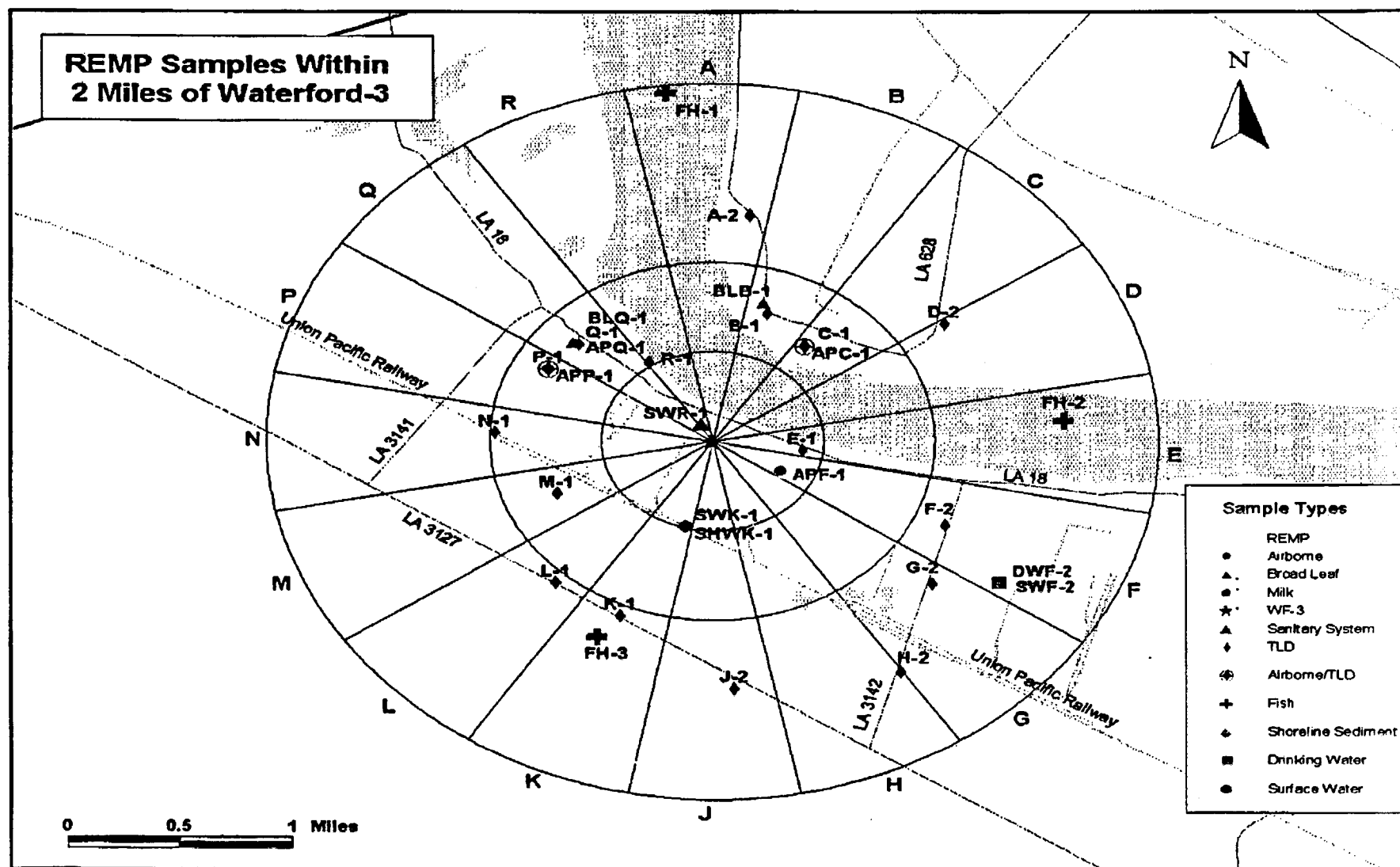
\* The letters I and O have been omitted from these sector designators so as to eliminate possible confusion between letters and numbers.

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Attachment 7.15 (1 of 1)

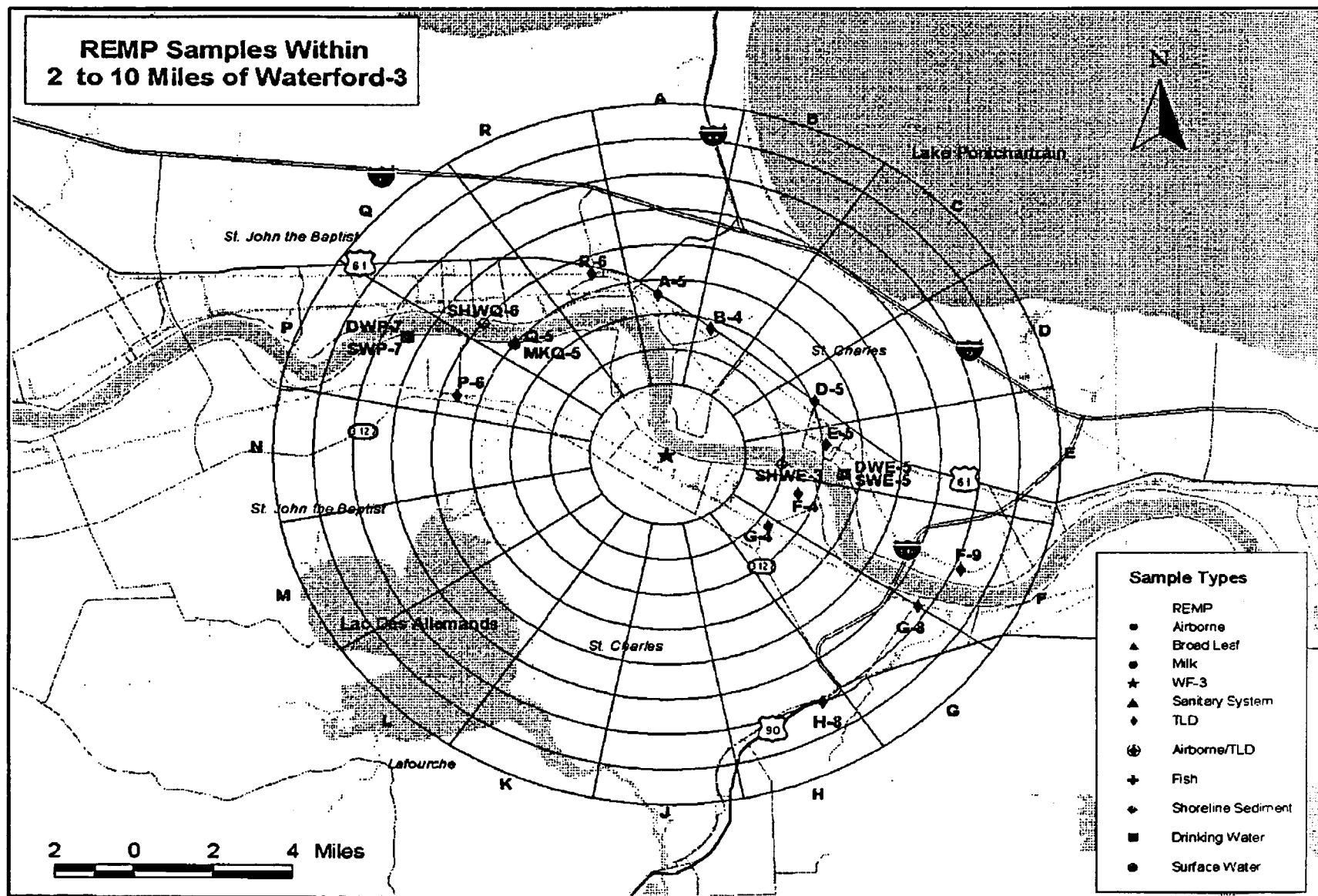
# RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

## REMP SAMPLING LOCATIONS WITHIN 2 MILES OF WATERFORD 3



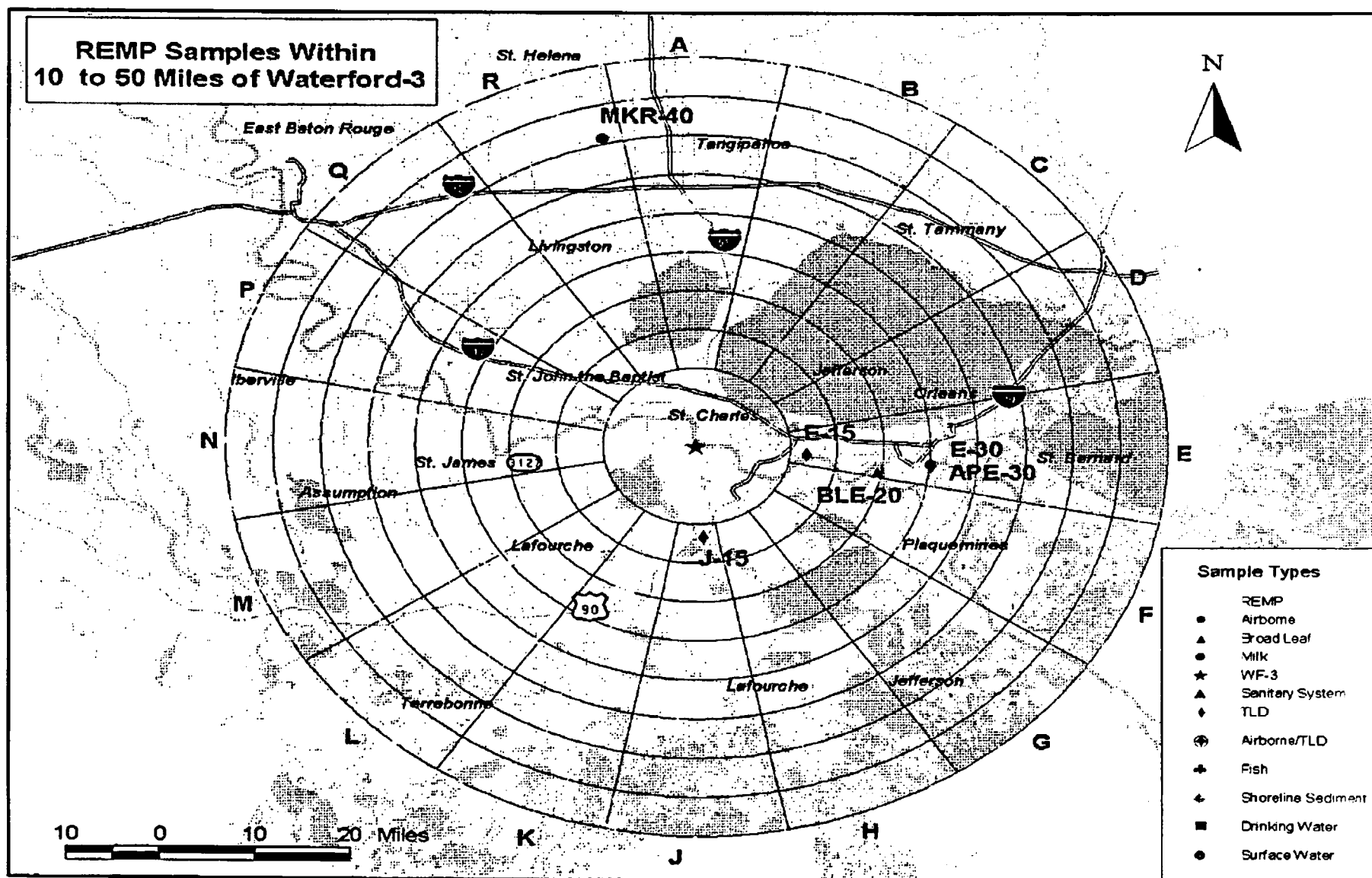
# RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

REMP SAMPLES 2 TO 10 MILES  
FROM WATERFORD 3



# RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

REMP SAMPLES 10 TO 50 MILES  
FROM WATERFORD 3



# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for Adult age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Inhalation Pathway for Pi

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
H-3	0.00e+00	7.18e+02	7.18e+02	7.18e+02	7.18e+02	7.18e+02	7.18e+02
Be-10	1.58e+06	2.45e+05	3.97e+04	0.00e+00	0.00e+00	1.78e+06	1.34e+05
C-14	1.82e+04	3.41e+03	3.41e+03	3.41e+03	3.41e+03	3.41e+03	3.41e+03
N-13	5.02e+01	5.02e+01	5.02e+01	5.02e+01	5.02e+01	5.02e+01	5.02e+01
F-18	3.77e+03	0.00e+00	4.15e+02	0.00e+00	0.00e+00	0.00e+00	7.39e+01
Na-22	1.04e+05	1.04e+05	1.04e+05	1.04e+05	1.04e+05	1.04e+05	1.04e+05
Na-24	1.02e+04	1.02e+04	1.02e+04	1.02e+04	1.02e+04	1.02e+04	1.02e+04
P-32	1.32e+06	7.71e+04	5.01e+04	0.00e+00	0.00e+00	0.00e+00	8.64e+04
Ca-41	3.06e+05	0.00e+00	3.30e+04	0.00e+00	0.00e+00	3.06e+04	2.29e+03
Sc-46	4.41e+05	8.56e+05	2.49e+05	0.00e+00	7.99e+05	0.00e+00	2.58e+05
Cr-51	0.00e+00	0.00e+00	1.00e+02	5.95e+01	2.28e+01	1.44e+04	3.32e+03
Mn-54	0.00e+00	3.96e+04	6.30e+03	0.00e+00	9.84e+03	1.40e+06	7.74e+04
Mn-56	0.00e+00	1.24e+00	1.83e-01	0.00e+00	1.30e+00	9.44e+03	2.02e+04
Fe-55	2.46e+04	1.70e+04	3.94e+03	0.00e+00	0.00e+00	7.21e+04	6.03e+03
Fe-59	1.18e+04	2.78e+04	1.06e+04	0.00e+00	0.00e+00	1.02e+06	1.88e+05
Co-57	0.00e+00	6.92e+02	6.71e+02	0.00e+00	0.00e+00	3.70e+05	3.14e+04
Co-58	0.00e+00	1.58e+03	2.07e+03	0.00e+00	0.00e+00	9.28e+05	1.06e+05
Co-60	0.00e+00	1.15e+04	1.48e+04	0.00e+00	0.00e+00	5.97e+06	2.85e+05
Ni-59	3.25e+04	1.17e+04	5.42e+03	0.00e+00	0.00e+00	6.56e+04	4.89e+03
Ni-63	4.32e+05	3.14e+04	1.45e+04	0.00e+00	0.00e+00	1.78e+05	1.34e+04
Ni-65	1.54e+00	2.10e-01	9.12e-02	0.00e+00	0.00e+00	5.60e+03	1.23e+04
Cu-64	0.00e+00	1.46e+00	6.15e-01	0.00e+00	4.62e+00	6.78e+03	4.90e+04
Zn-65	3.24e+04	1.03e+05	4.66e+04	0.00e+00	6.90e+04	8.64e+05	5.34e+04
Zn-69	3.38e-02	6.51e-02	4.52e-03	0.00e+00	4.22e-02	9.20e+02	1.63e+01
Zn-69m	8.16e+00	1.96e+01	1.79e+00	0.00e+00	1.18e+01	1.90e+04	1.37e+05
Se-79	0.00e+00	3.06e+03	4.87e+02	0.00e+00	4.55e+03	3.58e+05	2.66e+04
Br-82	0.00e+00	0.00e+00	1.35e+04	0.00e+00	0.00e+00	0.00e+00	1.04e+04
Br-83	0.00e+00	0.00e+00	2.41e+02	0.00e+00	0.00e+00	0.00e+00	2.32e+02
Br-84	0.00e+00	0.00e+00	3.13e+02	0.00e+00	0.00e+00	0.00e+00	1.64e-03
Br-85	0.00e+00	0.00e+00	1.28e+01	0.00e+00	0.00e+00	0.00e+00	0.00e+00

Conversion factors are in units of mrem/yr per uCi/cubic meter.



# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for Adult age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Inhalation Pathway for Pi

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Rb-86	0.00e+00	1.35e+05	5.90e+04	0.00e+00	0.00e+00	0.00e+00	1.66e+04
Rb-87	0.00e+00	7.89e+04	2.57e+04	0.00e+00	0.00e+00	0.00e+00	2.30e+03
Rb-88	0.00e+00	3.87e+02	1.93e+02	0.00e+00	0.00e+00	0.00e+00	3.34e-09
Rb-89	0.00e+00	2.56e+02	1.70e+02	0.00e+00	0.00e+00	0.00e+00	9.28e-12
Sr-89	3.04e+05	0.00e+00	8.72e+03	0.00e+00	0.00e+00	1.40e+06	3.50e+05
Sr-90	2.87e+07	0.00e+00	5.77e+05	0.00e+00	0.00e+00	9.60e+06	7.22e+05
Sr-91	6.19e+01	0.00e+00	2.50e+00	0.00e+00	0.00e+00	3.65e+04	1.91e+05
Sr-92	6.74e+00	0.00e+00	2.91e-01	0.00e+00	0.00e+00	1.65e+04	4.30e+04
Y-90	2.09e+03	0.00e+00	5.61e+01	0.00e+00	0.00e+00	1.70e+05	5.06e+05
Y-91	4.62e+05	0.00e+00	1.24e+04	0.00e+00	0.00e+00	1.70e+06	3.85e+05
Y-91m	2.61e-01	0.00e+00	1.02e-02	0.00e+00	0.00e+00	1.92e+03	1.33e+00
Y-92	1.03e+01	0.00e+00	3.02e-01	0.00e+00	0.00e+00	1.57e+04	7.35e+04
Y-93	9.44e+01	0.00e+00	2.61e+00	0.00e+00	0.00e+00	4.85e+04	4.22e+05
Zr-93	4.18e+05	2.34e+04	1.10e+04	0.00e+00	8.88e+04	1.70e+05	1.21e+04
Zr-95	1.07e+05	3.44e+04	2.33e+04	0.00e+00	5.42e+04	1.77e+06	1.50e+05
Zr-97	9.68e+01	1.96e+01	9.04e+00	0.00e+00	2.97e+01	7.87e+04	5.23e+05
Nb-93m	2.48e+05	8.08e+04	1.99e+04	0.00e+00	9.28e+04	2.49e+05	1.90e+04
Nb-95	1.41e+04	7.82e+03	4.21e+03	0.00e+00	7.74e+03	5.05e+05	1.04e+05
Nb-97	2.22e-01	5.62e-02	2.05e-02	0.00e+00	6.54e-02	2.40e+03	2.42e+02
Mo-93	0.00e+00	9.36e+03	2.54e+02	0.00e+00	2.84e+03	4.09e+05	3.03e+04
Mo-99	0.00e+00	1.21e+02	2.30e+01	0.00e+00	2.91e+02	9.12e+04	2.48e+05
Tc-101	4.18e-05	6.02e-05	5.90e-04	0.00e+00	1.08e-03	3.99e+02	1.09e-11
Tc-99	2.50e+02	3.71e+02	1.00e+02	0.00e+00	4.68e+03	8.08e+05	6.03e+04
Tc-99m	1.03e-03	2.91e-03	3.70e-02	0.00e+00	4.42e-02	7.64e+02	4.16e+03
Ru-103	1.53e+03	0.00e+00	6.58e+02	0.00e+00	5.83e+03	5.05e+05	1.10e+05
Ru-105	7.90e-01	0.00e+00	3.11e-01	0.00e+00	1.02e+00	1.10e+04	4.82e+04
Ru-106	6.91e+04	0.00e+00	8.72e+03	0.00e+00	1.34e+05	9.36e+06	9.12e+05
Rh-105	7.39e+00	5.38e+00	3.54e+00	0.00e+00	2.29e+01	1.93e+04	8.72e+04
Pd-107	0.00e+00	6.62e+02	4.70e+01	0.00e+00	5.26e+03	7.58e+04	5.65e+03
Pd-109	0.00e+00	3.70e+00	9.28e-01	0.00e+00	1.88e+01	1.48e+04	1.22e+05

Conversion factors are in units of mrem/yr per uCi/cubic meter.

DOSE FACTORS DUE TO RADIONUCLIDES  
OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for Adult age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Inhalation Pathway for Pi

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Ag-110m	1.08e+04	1.00e+04	5.94e+03	0.00e+00	1.97e+04	4.63e+06	3.02e+05
Ag-111	3.40e+02	1.42e+02	7.10e+01	0.00e+00	4.59e+02	1.86e+05	2.23e+05
Cd-113m	0.00e+00	1.23e+06	3.98e+04	0.00e+00	1.37e+06	1.66e+06	1.27e+05
Cd-115m	0.00e+00	1.97e+05	6.36e+03	0.00e+00	1.58e+05	1.41e+06	3.84e+05
Sn-123	2.42e+05	5.34e+03	7.86e+03	4.54e+03	0.00e+00	2.30e+06	3.14e+05
Sn-125	9.28e+03	2.50e+02	5.62e+02	2.07e+02	0.00e+00	5.90e+05	5.45e+05
Sn-126	1.26e+06	3.34e+04	4.80e+04	9.84e+03	0.00e+00	9.36e+06	1.27e+05
Sb-124	3.12e+04	5.89e+02	1.24e+04	7.55e+01	0.00e+00	2.48e+06	4.06e+05
Sb-125	5.34e+04	5.95e+02	1.26e+04	5.40e+01	0.00e+00	1.74e+06	1.01e+05
Sb-126	3.60e+03	7.30e+01	1.30e+03	2.20e+01	0.00e+00	7.66e+05	4.81e+05
Sb-127	2.64e+02	5.78e+00	1.02e+02	3.18e+00	0.00e+00	1.64e+05	3.02e+05
Te-125m	3.42e+03	1.58e+03	4.67e+02	1.05e+03	1.24e+04	3.14e+05	7.06e+04
Te-127	1.40e+00	6.42e-01	3.10e-01	1.06e+00	5.10e+00	6.51e+03	5.74e+04
Te-127m	1.26e+04	5.77e+03	1.57e+03	3.29e+03	4.58e+04	9.60e+05	1.50e+05
Te-129	4.98e-02	2.39e-02	1.24e-02	3.90e-02	1.87e-01	1.94e+03	1.57e+02
Te-129m	9.76e+03	4.67e+03	1.58e+03	3.44e+03	3.66e+04	1.16e+06	3.83e+05
Te-131	1.11e-02	5.95e-03	3.59e-03	9.36e-03	4.37e-02	1.39e+03	1.84e+01
Te-131m	6.99e+01	4.36e+01	2.90e+01	5.50e+01	3.09e+02	1.46e+05	5.56e+05
Te-132	2.60e+02	2.15e+02	1.62e+02	1.90e+02	1.46e+03	2.88e+05	5.10e+05
Te-133m	5.79e-02	4.32e-02	3.34e-02	5.02e-02	2.99e-01	4.41e+03	6.12e+01
Te-134	3.07e-02	2.58e-02	1.26e-02	2.75e-02	1.74e-01	3.47e+03	2.38e-01
I-129	1.98e+04	1.69e+04	5.53e+04	4.43e+07	3.62e+04	0.00e+00	1.78e+03
I-130	4.58e+03	1.34e+04	5.28e+03	1.14e+06	2.09e+04	0.00e+00	7.69e+03
I-131	2.52e+04	3.58e+04	2.05e+04	1.19e+07	6.13e+04	0.00e+00	6.28e+03
I-132	1.16e+03	3.26e+03	1.16e+03	1.14e+05	5.18e+03	0.00e+00	4.06e+02
I-133	8.64e+03	1.48e+04	4.52e+03	2.15e+06	2.58e+04	0.00e+00	8.88e+03
I-134	6.44e+02	1.73e+03	6.15e+02	2.98e+04	2.75e+03	0.00e+00	1.01e+00
I-135	2.68e+03	6.98e+03	2.57e+03	4.48e+05	1.11e+04	0.00e+00	5.25e+03
Cs-134	3.73e+05	8.48e+05	7.28e+05	0.00e+00	2.87e+05	9.76e+04	1.04e+04
Cs-134m	1.27e+02	2.56e+02	1.38e+02	0.00e+00	1.46e+02	2.34e+01	6.34e+01

Conversion factors are in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for Adult age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Inhalation Pathway for P<sub>i</sub>

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Cs-135	1.17e+05	1.03e+05	4.79e+04	0.00e+00	4.09e+04	1.26e+04	1.69e+03
Cs-136	3.90e+04	1.46e+05	1.10e+05	0.00e+00	8.56e+04	1.20e+04	1.17e+04
Cs-137	4.78e+05	6.21e+05	4.28e+05	0.00e+00	2.22e+05	7.52e+04	8.40e+03
Cs-138	3.31e+02	6.21e+02	3.24e+02	0.00e+00	4.80e+02	4.86e+01	1.86e-03
Cs-139	2.05e+02	2.90e+02	1.11e+02	0.00e+00	2.44e+02	2.27e+01	4.39e-21
Ba-139	9.36e-01	6.66e-04	2.74e-02	0.00e+00	6.22e-04	3.76e+03	8.96e+02
Ba-140	3.90e+04	4.90e+01	2.57e+03	0.00e+00	1.67e+01	1.27e+06	2.18e+05
Ba-141	1.00e-01	7.53e-05	3.36e-03	0.00e+00	7.00e-05	1.94e+03	1.16e-07
Ba-142	2.63e-02	2.70e-05	1.66e-03	0.00e+00	2.29e-05	1.19e+03	1.57e-16
La-140	3.44e+02	1.74e+02	4.58e+01	0.00e+00	0.00e+00	1.36e+05	4.58e+05
La-141	4.27e+00	1.33e+00	2.17e-01	0.00e+00	0.00e+00	1.08e+04	5.85e+04
La-142	6.83e-01	3.10e-01	7.72e-02	0.00e+00	0.00e+00	6.33e+03	2.11e+03
Ce-141	1.99e+04	1.35e+04	1.53e+03	0.00e+00	6.26e+03	3.62e+05	1.20e+05
Ce-143	1.86e+02	1.38e+02	1.53e+01	0.00e+00	6.08e+01	7.98e+04	2.26e+05
Ce-144	3.43e+06	1.43e+06	1.84e+05	0.00e+00	8.48e+05	7.78e+06	8.16e+05
Pr-143	9.36e+03	3.75e+03	4.64e+02	0.00e+00	2.16e+03	2.81e+05	2.00e+05
Pr-144	3.01e-02	1.25e-02	1.53e-03	0.00e+00	7.05e-03	1.02e+03	2.15e-08
Nd-147	5.27e+03	6.10e+03	3.65e+02	0.00e+00	3.56e+03	2.21e+05	1.73e+05
Pm-147	6.70e+05	6.30e+04	2.55e+04	0.00e+00	1.19e+05	5.28e+05	4.43e+04
Pm-148	3.07e+03	5.10e+02	2.56e+02	0.00e+00	9.60e+02	3.13e+05	4.64e+05
Pm-148m	7.86e+04	2.03e+04	1.55e+04	0.00e+00	3.08e+04	1.71e+06	3.34e+05
Pm-149	2.75e+02	3.90e+01	1.59e+01	0.00e+00	7.35e+01	5.77e+04	2.00e+05
Pm-151	6.80e+01	1.14e+01	5.77e+00	0.00e+00	2.04e+01	3.15e+04	1.60e+05
Sm-151	6.87e+05	1.18e+05	2.84e+04	0.00e+00	1.33e+05	3.56e+05	2.60e+04
Sm-153	1.36e+02	1.14e+02	8.32e+00	0.00e+00	3.67e+01	3.31e+04	1.26e+05
Eu-152	1.90e+06	4.33e+05	3.81e+05	0.00e+00	2.68e+06	2.74e+06	1.27e+05
Eu-154	5.92e+06	7.28e+05	5.18e+05	0.00e+00	3.49e+06	4.67e+06	2.72e+05
Eu-155	8.08e+05	1.14e+05	7.37e+04	0.00e+00	5.27e+05	7.57e+05	4.76e+04
Eu-156	1.54e+04	1.18e+04	1.92e+03	0.00e+00	7.96e+03	6.85e+05	3.60e+05
Tb-160	1.77e+05	0.00e+00	2.20e+04	0.00e+00	7.28e+04	1.54e+06	2.14e+05

Conversion factors are in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for Adult age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Inhalation Pathway for P<sub>i</sub>

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Ho-166m	2.70e+06	8.40e+05	6.40e+05	0.00e+00	1.26e+06	3.15e+06	1.27e+05
W-181	4.98e+01	1.62e+01	1.74e+00	0.00e+00	0.00e+00	1.37e+04	2.02e+03
W-185	1.56e+03	5.18e+02	5.45e+01	0.00e+00	0.00e+00	4.46e+05	8.56e+04
W-187	8.48e+00	7.08e+00	2.48e+00	0.00e+00	0.00e+00	2.90e+04	1.55e+05
Pb-210	2.11e+08	5.38e+07	6.70e+06	0.00e+00	1.70e+08	2.10e+08	1.21e+04
Bi-210	1.85e+03	1.27e+04	1.06e+03	0.00e+00	1.54e+05	8.88e+06	2.36e+05
Po-210	3.18e+06	6.88e+06	7.66e+05	0.00e+00	2.36e+07	2.51e+08	3.35e+05
Ra-223	1.44e+06	2.22e+03	2.88e+05	0.00e+00	6.28e+04	2.04e+08	2.27e+06
Ra-224	1.58e+05	3.82e+02	3.17e+04	0.00e+00	1.08e+04	7.02e+07	2.41e+06
Ra-225	2.40e+06	2.85e+03	4.79e+05	0.00e+00	8.08e+04	2.34e+08	2.17e+06
Ra-226	1.00e+09	1.91e+04	7.31e+08	0.00e+00	5.42e+05	9.36e+08	2.35e+06
Ra-228	3.53e+08	9.84e+03	3.82e+08	0.00e+00	2.78e+05	1.29e+09	4.00e+05
Ac-225	3.38e+06	4.66e+06	2.27e+05	0.00e+00	5.30e+05	1.77e+08	2.02e+06
Ac-227	1.84e+10	2.44e+09	1.09e+09	0.00e+00	7.86e+08	1.93e+09	4.06e+05
Th-227	1.74e+06	3.14e+04	5.00e+04	0.00e+00	1.78e+05	3.02e+08	2.67e+06
Th-228	1.60e+09	2.71e+07	5.42e+07	0.00e+00	1.51e+08	8.08e+09	2.79e+06
Th-229	1.21e+11	3.47e+09	2.01e+09	0.00e+00	1.70e+10	2.90e+10	3.86e+05
Th-230	1.83e+10	1.05e+09	5.09e+08	0.00e+00	5.12e+09	4.97e+09	2.98e+05
Th-232	2.05e+10	8.96e+08	7.23e+06	0.00e+00	4.38e+09	4.77e+09	2.54e+05
Th-234	1.30e+04	7.65e+02	3.76e+02	0.00e+00	4.33e+03	1.51e+06	5.62e+05
Pa-231	4.06e+10	1.53e+09	1.58e+09	0.00e+00	8.56e+09	4.60e+08	3.55e+05
Pa-233	9.68e+03	1.94e+03	1.67e+03	0.00e+00	7.32e+03	2.82e+05	8.16e+04
U-232	4.11e+08	0.00e+00	2.93e+07	0.00e+00	4.45e+07	1.78e+09	3.37e+05
U-233	8.72e+07	0.00e+00	5.28e+06	0.00e+00	2.03e+07	4.26e+08	3.11e+05
U-234	8.32e+07	0.00e+00	5.17e+06	0.00e+00	1.99e+07	4.18e+08	3.05e+05
U-235	8.00e+07	0.00e+00	4.86e+06	0.00e+00	1.87e+07	3.92e+08	3.87e+05
U-236	8.00e+07	0.00e+00	4.96e+06	0.00e+00	1.91e+07	4.00e+08	2.86e+05
U-237	2.94e+02	0.00e+00	7.82e+01	0.00e+00	1.21e+03	8.16e+04	9.60e+04
U-238	7.66e+07	0.00e+00	4.54e+06	0.00e+00	1.74e+07	3.66e+08	2.73e+05
Np-237	1.25e+10	8.00e+09	5.50e+08	0.00e+00	4.08e+09	4.18e+08	3.94e+05

Conversion factors are in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for Adult age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Inhalation Pathway for P<sub>i</sub>

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Np-238	2.37e+03	5.76e+02	3.69e+01	0.00e+00	2.18e+02	8.16e+04	1.70e+05
Np-239	2.30e+02	2.03e+02	1.24e+01	0.00e+00	7.00e+01	3.76e+04	1.19e+05
Pu-238	1.14e+10	7.77e+09	5.52e+08	0.00e+00	2.37e+09	1.46e+09	3.62e+05
Pu-239	1.33e+10	8.56e+09	6.20e+08	0.00e+00	2.64e+09	1.38e+09	3.30e+05
Pu-240	1.32e+10	8.56e+09	6.18e+08	0.00e+00	2.63e+09	1.38e+09	3.37e+05
Pu-241	2.74e+08	6.95e+07	1.03e+07	0.00e+00	4.74e+07	1.22e+06	6.92e+03
Pu-242	1.22e+10	8.24e+09	5.97e+08	0.00e+00	2.54e+09	1.32e+09	3.24e+05
Pu-244	1.43e+10	9.44e+09	6.83e+08	0.00e+00	2.91e+09	1.51e+09	4.82e+05
Am-241	1.34e+10	9.04e+09	5.37e+08	0.00e+00	4.03e+09	4.85e+08	3.68e+05
Am-242m	1.36e+10	8.48e+09	5.38e+08	0.00e+00	4.01e+09	1.95e+08	4.63e+05
Am-243	1.34e+10	8.80e+09	5.26e+08	0.00e+00	3.96e+09	4.60e+08	4.32e+05
Cm-242	1.78e+08	1.42e+08	7.87e+06	0.00e+00	3.58e+07	3.14e+08	3.93e+05
Cm-243	8.80e+09	6.09e+09	3.69e+08	0.00e+00	1.72e+09	5.05e+08	3.87e+05
Cm-244	6.70e+09	4.70e+09	2.81e+08	0.00e+00	1.31e+09	4.85e+08	3.74e+05
Cm-245	1.39e+10	9.12e+09	5.71e+08	0.00e+00	2.66e+09	4.68e+08	3.49e+05
Cm-246	1.38e+10	9.12e+09	5.70e+08	0.00e+00	2.66e+09	4.77e+08	3.43e+05
Cm-247	1.34e+10	8.96e+09	5.62e+08	0.00e+00	2.62e+09	4.68e+08	4.50e+05
Cm-248	1.12e+11	7.41e+10	4.63e+09	0.00e+00	2.16e+10	3.86e+09	7.27e+06
Cf-252	4.34e+09	0.00e+00	1.86e+08	0.00e+00	0.00e+00	1.59e+09	1.42e+06

Conversion factors are in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for Teen age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Inhalation Pathway for P<sub>i</sub>

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
H-3	0.00e+00	7.25e+02	7.25e+02	7.25e+02	7.25e+02	7.25e+02	7.25e+02
Be-10	2.22e+06	3.46e+05	5.67e+04	0.00e+00	0.00e+00	3.07e+06	1.42e+05
C-14	2.60e+04	4.87e+03	4.87e+03	4.87e+03	4.87e+03	4.87e+03	4.87e+03
N-13	6.92e+01	6.92e+01	6.92e+01	6.92e+01	6.92e+01	6.92e+01	6.92e+01
F-18	5.22e+03	0.00e+00	5.68e+02	0.00e+00	0.00e+00	0.00e+00	3.11e+02
Na-22	1.41e+05	1.41e+05	1.41e+05	1.41e+05	1.41e+05	1.41e+05	1.41e+05
Na-24	1.38e+04	1.38e+04	1.38e+04	1.38e+04	1.38e+04	1.38e+04	1.38e+04
P-32	1.89e+06	1.10e+05	7.16e+04	0.00e+00	0.00e+00	0.00e+00	9.28e+04
Ca-41	3.24e+05	0.00e+00	3.50e+04	0.00e+00	0.00e+00	8.08e+08	2.42e+03
Sc-46	5.79e+05	1.13e+06	3.34e+05	0.00e+00	1.08e+06	0.00e+00	2.38e+05
Cr-51	0.00e+00	0.00e+00	1.35e+02	7.50e+01	3.07e+01	2.10e+04	3.00e+03
Mn-54	0.00e+00	5.11e+04	8.40e+03	0.00e+00	1.27e+04	1.98e+06	6.68e+04
Mn-56	0.00e+00	1.70e+00	2.52e-01	0.00e+00	1.79e+00	1.52e+04	5.74e+04
Fe-55	3.34e+04	2.38e+04	5.54e+03	0.00e+00	0.00e+00	1.24e+05	6.39e+03
Fe-59	1.59e+04	3.70e+04	1.43e+04	0.00e+00	0.00e+00	1.53e+06	1.78e+05
Co-57	0.00e+00	9.44e+02	9.20e+02	0.00e+00	0.00e+00	5.86e+05	3.14e+04
Co-58	0.00e+00	2.07e+03	2.78e+03	0.00e+00	0.00e+00	1.34e+06	9.52e+04
Co-60	0.00e+00	1.51e+04	1.98e+04	0.00e+00	0.00e+00	8.72e+06	2.59e+05
Ni-59	4.35e+04	1.62e+04	7.39e+03	0.00e+00	0.00e+00	1.13e+05	5.18e+03
Ni-63	5.80e+05	4.34e+04	1.98e+04	0.00e+00	0.00e+00	3.07e+05	1.42e+04
Ni-65	2.18e+00	2.93e-01	1.27e-01	0.00e+00	0.00e+00	9.36e+03	3.67e+04
Cu-64	0.00e+00	2.03e+00	8.48e-01	0.00e+00	6.41e+00	1.11e+04	6.14e+04
Zn-65	3.86e+04	1.34e+05	6.24e+04	0.00e+00	8.64e+04	1.24e+06	4.66e+04
Zn-69	4.83e-02	9.20e-02	6.46e-03	0.00e+00	6.02e-02	1.58e+03	2.85e+02
Zn-69m	1.15e+01	2.71e+01	2.49e+00	0.00e+00	1.65e+01	3.14e+04	1.71e+05
Se-79	0.00e+00	4.34e+03	6.97e+02	0.00e+00	6.50e+03	6.17e+05	2.82e+04
Br-82	0.00e+00	0.00e+00	1.82e+04	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Br-83	0.00e+00	0.00e+00	3.44e+02	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Br-84	0.00e+00	0.00e+00	4.33e+02	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Br-85	0.00e+00	0.00e+00	1.83e+01	0.00e+00	0.00e+00	0.00e+00	0.00e+00

Conversion factors are in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for Teen age group by nuclide.

Waterford Steam Electric Station

Pathway : Inhalation Pathway for P<sub>i</sub>

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Rb-86	0.00e+00	1.90e+05	8.40e+04	0.00e+00	0.00e+00	0.00e+00	1.77e+04
Rb-87	0.00e+00	1.12e+05	3.66e+04	0.00e+00	0.00e+00	0.00e+00	2.44e+03
Rb-88	0.00e+00	5.46e+02	2.72e+02	0.00e+00	0.00e+00	0.00e+00	2.92e-05
Rb-89	0.00e+00	3.52e+02	2.33e+02	0.00e+00	0.00e+00	0.00e+00	3.38e-07
Sr-89	4.34e+05	0.00e+00	1.25e+04	0.00e+00	0.00e+00	2.42e+06	3.71e+05
Sr-90	3.31e+07	0.00e+00	6.66e+05	0.00e+00	0.00e+00	1.65e+07	7.65e+05
Sr-91	8.80e+01	0.00e+00	3.51e+00	0.00e+00	0.00e+00	6.07e+04	2.59e+05
Sr-92	9.52e+00	0.00e+00	4.06e-01	0.00e+00	0.00e+00	2.74e+04	1.19e+05
Y-90	2.98e+03	0.00e+00	8.00e+01	0.00e+00	0.00e+00	2.93e+05	5.59e+05
Y-91	6.61e+05	0.00e+00	1.77e+04	0.00e+00	0.00e+00	2.94e+06	4.09e+05
Y-91m	3.70e-01	0.00e+00	1.42e-02	0.00e+00	0.00e+00	3.20e+03	3.02e+01
Y-92	1.47e+01	0.00e+00	4.29e-01	0.00e+00	0.00e+00	2.68e+04	1.65e+05
Y-93	1.35e+02	0.00e+00	3.72e+00	0.00e+00	0.00e+00	8.32e+04	5.79e+05
Zr-93	5.46e+05	2.70e+04	1.47e+04	0.00e+00	9.28e+04	2.94e+05	1.28e+04
Zr-95	1.46e+05	4.58e+04	3.15e+04	0.00e+00	6.74e+04	2.69e+06	1.49e+05
Zr-97	1.38e+02	2.72e+01	1.26e+01	0.00e+00	4.12e+01	1.30e+05	6.30e+05
Nb-93m	3.31e+05	1.09e+05	2.73e+04	0.00e+00	1.27e+05	4.29e+05	2.02e+04
Nb-95	1.86e+04	1.03e+04	5.66e+03	0.00e+00	1.00e+04	7.51e+05	9.68e+04
Nb-97	3.14e-01	7.78e-02	2.84e-02	0.00e+00	9.12e-02	3.93e+03	2.17e+03
Mo-93	0.00e+00	1.33e+04	3.62e+02	0.00e+00	4.05e+03	7.05e+05	3.19e+04
Mo-99	0.00e+00	1.69e+02	3.22e+01	0.00e+00	4.11e+02	1.54e+05	2.69e+05
Tc-101	5.92e-05	8.40e-05	8.24e-04	0.00e+00	1.52e-03	6.67e+02	8.72e-07
Tc-99	3.58e+02	5.26e+02	1.43e+02	0.00e+00	6.68e+03	1.39e+06	6.39e+04
Tc-99m	1.38e-03	3.86e-03	4.99e-02	0.00e+00	5.76e-02	1.15e+03	6.13e+03
Ru-103	2.10e+03	0.00e+00	8.96e+02	0.00e+00	7.43e+03	7.83e+05	1.09e+05
Ru-105	1.12e+00	0.00e+00	4.34e-01	0.00e+00	1.41e+00	1.82e+04	9.04e+04
Ru-106	9.84e+04	0.00e+00	1.24e+04	0.00e+00	1.90e+05	1.61e+07	9.60e+05
Rh-105	1.06e+01	7.58e+00	4.99e+00	0.00e+00	3.23e+01	3.27e+04	9.84e+04
Pd-107	0.00e+00	9.36e+02	6.71e+01	0.00e+00	7.51e+03	1.30e+05	5.99e+03
Pd-109	0.00e+00	5.25e+00	1.33e+00	0.00e+00	2.69e+01	2.55e+04	1.57e+05

Conversion factors are in units of mrem/yr per uCi/cubic meter.

DOSE FACTORS DUE TO RADIONUCLIDES  
OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for Teen age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Inhalation Pathway for Pi

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Ag-110m	1.38e+04	1.31e+04	7.99e+03	0.00e+00	2.50e+04	6.75e+06	2.73e+05
Ag-111	4.86e+02	2.02e+02	1.01e+02	0.00e+00	6.54e+02	3.20e+05	2.40e+05
Cd-113m	0.00e+00	1.74e+06	5.68e+04	0.00e+00	1.94e+06	2.87e+06	1.34e+05
Cd-115m	0.00e+00	2.78e+05	9.12e+03	0.00e+00	2.26e+05	2.42e+06	4.08e+05
Sn-123	3.45e+05	7.55e+03	1.12e+04	6.04e+03	0.00e+00	3.97e+06	3.33e+05
Sn-125	1.33e+04	3.54e+02	7.99e+02	2.76e+02	0.00e+00	1.01e+06	5.83e+05
Sn-126	1.74e+06	4.31e+04	6.59e+04	1.14e+04	0.00e+00	1.38e+07	1.34e+05
Sb-124	4.30e+04	7.94e+02	1.68e+04	9.76e+01	0.00e+00	3.85e+06	3.98e+05
Sb-125	7.38e+04	8.08e+02	1.72e+04	7.04e+01	0.00e+00	2.74e+06	9.92e+04
Sb-126	4.95e+03	1.02e+02	1.78e+03	2.80e+01	0.00e+00	1.24e+06	4.81e+05
Sb-127	3.71e+02	7.94e+00	1.40e+02	4.17e+00	0.00e+00	2.65e+05	3.15e+05
Te-125m	4.88e+03	2.24e+03	6.67e+02	1.40e+03	0.00e+00	5.36e+05	7.50e+04
Te-127	2.01e+00	9.12e-01	4.42e-01	1.42e+00	7.28e+00	1.12e+04	8.08e+04
Te-127m	1.80e+04	8.16e+03	2.18e+03	4.38e+03	6.54e+04	1.66e+06	1.59e+05
Te-129	7.10e-02	3.38e-02	1.76e-02	5.18e-02	2.66e-01	3.30e+03	1.62e+03
Te-129m	1.39e+04	6.58e+03	2.25e+03	4.58e+03	5.19e+04	1.98e+06	4.05e+05
Te-131	1.58e-02	8.32e-03	5.04e-03	1.24e-02	6.18e-02	2.34e+03	1.51e+01
Te-131m	9.84e+01	6.01e+01	4.02e+01	7.25e+01	4.39e+02	2.38e+05	6.21e+05
Te-132	3.60e+02	2.90e+02	2.19e+02	2.46e+02	1.95e+03	4.49e+05	4.63e+05
Te-133m	8.08e-02	5.86e-02	4.57e-02	6.54e-02	4.06e-01	6.97e+03	9.84e+02
Te-134	4.25e-02	3.48e-02	2.91e-02	3.57e-02	2.33e-01	5.40e+03	1.10e+01
I-129	2.82e+04	2.35e+04	3.92e+04	2.93e+07	4.21e+04	0.00e+00	1.83e+03
I-130	6.24e+03	1.79e+04	7.17e+03	1.49e+06	2.75e+04	0.00e+00	9.12e+03
I-131	3.54e+04	4.91e+04	2.64e+04	1.46e+07	8.40e+04	0.00e+00	6.49e+03
I-132	1.59e+03	4.38e+03	1.58e+03	1.51e+05	6.92e+03	0.00e+00	1.27e+03
I-133	1.22e+04	2.05e+04	6.22e+03	2.92e+06	3.59e+04	0.00e+00	1.03e+04
I-134	8.88e+02	2.32e+03	8.40e+02	3.95e+04	3.66e+03	0.00e+00	2.04e+01
I-135	3.70e+03	9.44e+03	3.49e+03	6.21e+05	1.49e+04	0.00e+00	6.95e+03
Cs-134	5.02e+05	1.13e+06	5.49e+05	0.00e+00	3.75e+05	1.46e+05	9.76e+03
Cs-134m	1.76e+02	3.48e+02	1.88e+02	0.00e+00	2.03e+02	3.65e+01	1.62e+02

Conversion factors are in units of mrem/yr per uCi/cubic meter.



# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for Teen age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Inhalation Pathway for Pi

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Cs-135	1.66e+05	1.46e+05	3.58e+04	0.00e+00	5.84e+04	2.16e+04	1.78e+03
Cs-136	5.15e+04	1.94e+05	1.37e+05	0.00e+00	1.10e+05	1.78e+04	1.09e+04
Cs-137	6.70e+05	8.48e+05	3.11e+05	0.00e+00	3.04e+05	1.21e+05	8.48e+03
Cs-138	4.66e+02	8.56e+02	4.46e+02	0.00e+00	6.62e+02	7.87e+01	2.70e-01
Cs-139	2.92e+02	4.10e+02	1.58e+02	0.00e+00	3.47e+02	3.89e+01	1.33e-13
Ba-139	1.34e+00	9.44e-04	3.90e-02	0.00e+00	8.88e-04	6.46e+03	6.45e+03
Ba-140	5.47e+04	6.70e+01	3.52e+03	0.00e+00	2.28e+01	2.03e+06	2.29e+05
Ba-141	1.42e-01	1.06e-04	4.74e-03	0.00e+00	9.84e-05	3.29e+03	7.46e-04
Ba-142	3.70e-02	3.70e-05	2.27e-03	0.00e+00	3.14e-05	1.91e+03	4.79e-10
La-140	4.79e+02	2.36e+02	6.26e+01	0.00e+00	0.00e+00	2.14e+05	4.87e+05
La-141	6.10e+00	1.88e+00	3.10e-01	0.00e+00	0.00e+00	1.85e+04	1.23e+05
La-142	9.60e-01	4.25e-01	1.06e-01	0.00e+00	0.00e+00	1.02e+04	1.20e+04
Ce-141	2.84e+04	1.90e+04	2.17e+03	0.00e+00	8.88e+03	6.14e+05	1.26e+05
Ce-143	2.66e+02	1.94e+02	2.16e+01	0.00e+00	8.64e+01	1.30e+05	2.55e+05
Ce-144	4.89e+06	2.02e+06	2.62e+05	0.00e+00	1.21e+06	1.34e+07	8.64e+05
Pr-143	1.34e+04	5.31e+03	6.62e+02	0.00e+00	3.09e+03	4.83e+05	2.14e+05
Pr-144	4.30e-02	1.76e-02	2.18e-03	0.00e+00	1.01e-02	1.75e+03	2.35e-04
Nd-147	7.86e+03	8.56e+03	5.13e+02	0.00e+00	5.02e+03	3.72e+05	1.82e+05
Pm-147	9.20e+05	8.80e+04	3.60e+04	0.00e+00	1.68e+05	9.12e+05	4.70e+04
Pm-148	4.35e+03	7.10e+02	3.58e+02	0.00e+00	1.28e+03	5.22e+05	4.91e+05
Pm-148m	1.06e+05	2.68e+04	2.10e+04	0.00e+00	4.06e+04	2.56e+06	3.28e+05
Pm-149	3.93e+02	5.51e+01	2.27e+01	0.00e+00	1.05e+02	9.92e+04	2.23e+05
Pm-151	9.60e+01	1.59e+01	8.08e+00	0.00e+00	2.86e+01	5.25e+04	1.82e+05
Sm-151	8.56e+05	1.68e+05	3.89e+04	0.00e+00	1.82e+05	6.14e+05	2.82e+04
Sm-153	1.94e+02	1.61e+02	1.18e+01	0.00e+00	5.25e+01	5.69e+04	1.42e+05
Eu-152	2.37e+06	5.75e+05	5.04e+05	0.00e+00	2.67e+06	4.01e+06	1.08e+05
Eu-154	7.54e+06	9.84e+05	6.88e+05	0.00e+00	4.35e+06	7.30e+06	2.67e+05
Eu-155	1.60e+06	1.57e+05	9.68e+04	0.00e+00	6.12e+05	1.21e+07	4.78e+05
Eu-156	2.16e+04	1.62e+04	2.64e+03	0.00e+00	1.09e+04	1.10e+06	3.65e+05
Tb-160	2.43e+05	0.00e+00	3.03e+04	0.00e+00	9.60e+04	2.38e+06	2.08e+05

Conversion factors are in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for Teen age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Inhalation Pathway for P<sub>i</sub>

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Ho-166m	3.52e+06	1.09e+06	7.90e+05	0.00e+00	1.60e+06	4.99e+06	1.34e+05
W-181	7.12e+01	2.30e+01	2.41e+00	0.00e+00	0.00e+00	2.36e+04	2.15e+03
W-185	2.22e+03	7.34e+02	7.78e+01	0.00e+00	0.00e+00	7.68e+05	9.12e+04
W-187	1.20e+01	9.76e+00	3.43e+00	0.00e+00	0.00e+00	4.74e+04	1.77e+05
Pb-210	2.47e+08	6.62e+07	8.56e+06	0.00e+00	2.36e+08	3.62e+08	1.28e+04
Bi-210	2.64e+03	1.81e+04	1.51e+03	0.00e+00	2.19e+05	1.53e+07	2.55e+05
Po-210	4.54e+06	9.76e+06	1.10e+06	0.00e+00	3.37e+07	4.33e+08	3.56e+05
Ra-223	2.06e+06	3.14e+03	4.11e+05	0.00e+00	8.96e+04	3.51e+08	2.43e+06
Ra-224	2.26e+05	5.42e+02	4.52e+04	0.00e+00	1.54e+04	1.21e+08	2.63e+06
Ra-225	3.42e+06	4.03e+03	6.85e+05	0.00e+00	1.15e+05	4.03e+08	2.31e+06
Ra-226	1.06e+09	2.70e+04	7.90e+08	0.00e+00	7.74e+05	1.62e+09	2.49e+06
Ra-228	4.27e+08	1.39e+04	4.70e+08	0.00e+00	3.98e+05	2.22e+09	4.24e+05
Ac-225	4.83e+06	6.60e+06	3.25e+05	0.00e+00	7.58e+05	3.05e+08	2.16e+06
Ac-227	1.99e+10	2.95e+09	1.18e+09	0.00e+00	8.56e+08	3.33e+09	4.30e+05
Th-227	2.47e+06	4.45e+04	7.14e+04	0.00e+00	2.54e+05	5.20e+08	2.86e+06
Th-228	2.08e+09	3.50e+07	7.02e+07	0.00e+00	1.96e+08	1.35e+10	2.96e+06
Th-229	1.23e+11	3.55e+09	2.05e+09	0.00e+00	1.74e+10	4.19e+10	4.10e+05
Th-230	1.87e+10	1.07e+09	5.19e+08	0.00e+00	5.24e+09	7.18e+09	3.16e+05
Th-232	2.09e+10	9.12e+08	7.37e+06	0.00e+00	4.48e+09	6.88e+09	2.69e+05
Th-234	1.86e+04	1.08e+03	5.37e+02	0.00e+00	6.18e+03	2.61e+06	5.99e+05
Pa-231	4.26e+10	1.60e+09	1.66e+09	0.00e+00	8.96e+09	7.93e+08	3.77e+05
Pa-233	1.34e+04	2.59e+03	2.31e+03	0.00e+00	9.76e+03	4.31e+05	8.00e+04
U-232	5.85e+08	0.00e+00	4.18e+07	0.00e+00	6.35e+07	3.07e+09	3.57e+05
U-233	1.24e+08	0.00e+00	7.54e+06	0.00e+00	2.90e+07	7.34e+08	3.30e+05
U-234	1.18e+08	0.00e+00	7.38e+06	0.00e+00	2.84e+07	7.19e+08	3.23e+05
U-235	1.14e+08	0.00e+00	6.94e+06	0.00e+00	2.67e+07	6.75e+08	4.10e+05
U-236	1.14e+08	0.00e+00	7.09e+06	0.00e+00	2.73e+07	6.90e+08	3.03e+05
U-237	4.20e+02	0.00e+00	1.12e+02	0.00e+00	1.73e+03	1.41e+05	1.03e+05
U-238	1.09e+08	0.00e+00	6.48e+06	0.00e+00	2.50e+07	6.31e+08	2.90e+05
Np-237	1.31e+10	8.48e+09	5.77e+08	0.00e+00	4.28e+09	7.19e+08	4.18e+05

Conversion factors are in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for Teen age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Inhalation Pathway for P<sub>i</sub>

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Np-238	3.38e+03	8.16e+02	5.27e+01	0.00e+00	3.10e+02	1.40e+05	1.90e+05
Np-239	3.38e+02	2.88e+02	1.77e+01	0.00e+00	1.00e+02	6.49e+04	1.32e+05
Pu-238	1.20e+10	8.24e+09	5.78e+08	0.00e+00	2.48e+09	2.50e+09	3.83e+05
Pu-239	1.38e+10	8.96e+09	6.44e+08	0.00e+00	2.75e+09	2.34e+09	3.50e+05
Pu-240	1.38e+10	8.96e+09	6.43e+08	0.00e+00	2.74e+09	2.34e+09	3.57e+05
Pu-241	2.99e+08	7.65e+07	1.12e+07	0.00e+00	5.18e+07	2.08e+06	7.34e+03
Pu-242	1.28e+10	8.64e+09	6.20e+08	0.00e+00	2.65e+09	2.26e+09	3.43e+05
Pu-244	1.50e+10	9.92e+09	7.10e+08	0.00e+00	3.03e+09	2.58e+09	5.11e+05
Am-241	1.42e+10	9.60e+09	5.68e+08	0.00e+00	4.26e+09	8.40e+08	3.90e+05
Am-242m	1.43e+10	9.04e+09	5.72e+08	0.00e+00	4.24e+09	3.37e+08	4.91e+05
Am-243	1.42e+10	9.36e+09	5.56e+08	0.00e+00	4.17e+09	7.93e+08	4.58e+05
Cm-242	2.54e+08	2.01e+08	1.13e+07	0.00e+00	5.12e+07	5.41e+08	4.17e+05
Cm-243	9.52e+09	6.64e+09	4.00e+08	0.00e+00	1.87e+09	8.72e+08	4.10e+05
Cm-244	7.35e+09	5.22e+09	3.10e+08	0.00e+00	1.45e+09	8.40e+08	3.97e+05
Cm-245	1.46e+10	9.76e+09	6.02e+08	0.00e+00	2.82e+09	8.08e+08	3.70e+05
Cm-246	1.45e+10	9.76e+09	6.02e+08	0.00e+00	2.81e+09	8.24e+08	3.63e+05
Cm-247	1.42e+10	9.52e+09	5.93e+08	0.00e+00	2.77e+09	8.08e+08	4.78e+05
Cm-248	1.18e+11	7.86e+10	4.89e+09	0.00e+00	2.28e+10	6.66e+09	7.70e+06
Cf-252	5.73e+09	0.00e+00	2.46e+08	0.00e+00	0.00e+00	2.74e+09	1.51e+06

Conversion factors are in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for Child age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Inhalation Pathway for Pi

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
H-3	0.00e+00	6.40e+02	6.40e+02	6.40e+02	6.40e+02	6.40e+02	6.40e+02
Be-10	3.12e+06	3.64e+05	7.84e+04	0.00e+00	0.00e+00	2.74e+06	6.36e+04
C-14	3.59e+04	6.73e+03	6.73e+03	6.73e+03	6.73e+03	6.73e+03	6.73e+03
N-13	8.62e+01	8.62e+01	8.62e+01	8.62e+01	8.62e+01	8.62e+01	8.62e+01
F-18	6.96e+03	0.00e+00	6.84e+02	0.00e+00	0.00e+00	0.00e+00	1.25e+03
Na-22	1.63e+05	1.63e+05	1.63e+05	1.63e+05	1.63e+05	1.63e+05	1.63e+05
Na-24	1.61e+04	1.61e+04	1.61e+04	1.61e+04	1.61e+04	1.61e+04	1.61e+04
P-32	2.60e+06	1.14e+05	9.88e+04	0.00e+00	0.00e+00	0.00e+00	4.22e+04
Ca-41	2.61e+05	0.00e+00	2.85e+04	0.00e+00	0.00e+00	2.67e+08	1.09e+03
Sc-46	7.29e+05	9.99e+05	3.85e+05	0.00e+00	8.84e+05	0.00e+00	9.06e+04
Cr-51	0.00e+00	0.00e+00	1.54e+02	8.55e+01	2.43e+01	1.70e+04	1.08e+03
Mn-54	0.00e+00	4.29e+04	9.51e+03	0.00e+00	1.00e+04	1.58e+06	2.29e+04
Mn-56	0.00e+00	1.66e+00	3.12e-01	0.00e+00	1.67e+00	1.31e+04	1.23e+05
Fe-55	4.74e+04	2.52e+04	7.77e+03	0.00e+00	0.00e+00	1.11e+05	2.87e+03
Fe-59	2.07e+04	3.34e+04	1.67e+04	0.00e+00	0.00e+00	1.27e+06	7.07e+04
Co-57	0.00e+00	9.03e+02	1.07e+03	0.00e+00	0.00e+00	5.07e+05	1.32e+04
Co-58	0.00e+00	1.77e+03	3.16e+03	0.00e+00	0.00e+00	1.11e+06	3.44e+04
Co-60	0.00e+00	1.31e+04	2.26e+04	0.00e+00	0.00e+00	7.07e+06	9.62e+04
Ni-59	6.14e+04	1.73e+04	1.05e+04	0.00e+00	0.00e+00	1.01e+05	2.33e+03
Ni-63	8.21e+05	4.62e+04	2.80e+04	0.00e+00	0.00e+00	2.75e+05	6.33e+03
Ni-65	2.99e+00	2.96e-01	1.64e-01	0.00e+00	0.00e+00	8.18e+03	8.40e+04
Cu-64	0.00e+00	1.99e+00	1.07e+00	0.00e+00	6.03e+00	9.58e+03	3.67e+04
Zn-65	4.26e+04	1.13e+05	7.03e+04	0.00e+00	7.14e+04	9.95e+05	1.63e+04
Zn-69	6.70e-02	9.66e-02	8.92e-03	0.00e+00	5.85e-02	1.42e+03	1.02e+04
Zn-69m	1.58e+01	2.69e+01	3.18e+00	0.00e+00	1.56e+01	2.72e+04	1.00e+05
Se-79	0.00e+00	4.55e+03	9.62e+02	0.00e+00	6.33e+03	5.51e+05	1.27e+04
Br-82	0.00e+00	0.00e+00	2.09e+04	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Br-83	0.00e+00	0.00e+00	4.74e+02	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Br-84	0.00e+00	0.00e+00	5.48e+02	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Br-85	0.00e+00	0.00e+00	2.53e+01	0.00e+00	0.00e+00	0.00e+00	0.00e+00

Conversion factors are in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for Child age group by nuclide.

Waterford Steam Electric Station

Pathway : Inhalation Pathway for P<sub>i</sub>

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Rb-86	0.00e+00	1.98e+05	1.14e+05	0.00e+00	0.00e+00	0.00e+00	7.99e+03
Rb-87	0.00e+00	1.17e+05	5.07e+04	0.00e+00	0.00e+00	0.00e+00	1.10e+03
Rb-88	0.00e+00	5.62e+02	3.66e+02	0.00e+00	0.00e+00	0.00e+00	1.72e+01
Rb-89	0.00e+00	3.45e+02	2.90e+02	0.00e+00	0.00e+00	0.00e+00	1.89e+00
Sr-89	5.99e+05	0.00e+00	1.72e+04	0.00e+00	0.00e+00	2.16e+06	1.67e+05
Sr-90	3.85e+07	0.00e+00	7.66e+05	0.00e+00	0.00e+00	1.48e+07	3.43e+05
Sr-91	1.21e+02	0.00e+00	4.59e+00	0.00e+00	0.00e+00	5.33e+04	1.74e+05
Sr-92	1.31e+01	0.00e+00	5.25e-01	0.00e+00	0.00e+00	2.40e+04	2.42e+05
Y-90	4.11e+03	0.00e+00	1.11e+02	0.00e+00	0.00e+00	2.62e+05	2.68e+05
Y-91	9.14e+05	0.00e+00	2.44e+04	0.00e+00	0.00e+00	2.63e+06	1.84e+05
Y-91m	5.07e-01	0.00e+00	1.84e-02	0.00e+00	0.00e+00	2.81e+03	1.72e+03
Y-92	2.03e+01	0.00e+00	5.81e-01	0.00e+00	0.00e+00	2.39e+04	2.39e+05
Y-93	1.86e+02	0.00e+00	5.11e+00	0.00e+00	0.00e+00	7.44e+04	3.88e+05
Zr-93	7.66e+05	2.89e+04	2.05e+04	0.00e+00	1.11e+05	2.63e+05	5.44e+03
Zr-95	1.90e+05	4.18e+04	3.70e+04	0.00e+00	5.96e+04	2.23e+06	6.11e+04
Zr-97	1.88e+02	2.72e+01	1.60e+01	0.00e+00	3.88e+01	1.13e+05	3.51e+05
Nb-93m	4.70e+05	1.17e+05	3.85e+04	0.00e+00	1.27e+05	3.85e+05	9.06e+03
Nb-95	2.35e+04	9.18e+03	6.55e+03	0.00e+00	8.62e+03	6.14e+05	3.70e+04
Nb-97	4.29e-01	7.70e-02	3.60e-02	0.00e+00	8.55e-02	3.42e+03	2.78e+04
Mo-93	0.00e+00	1.39e+04	5.00e+02	0.00e+00	3.92e+03	6.29e+05	1.40e+04
Mo-99	0.00e+00	1.72e+02	4.26e+01	0.00e+00	3.92e+02	1.35e+05	1.27e+05
Tc-101	8.10e-05	8.51e-05	1.08e-03	0.00e+00	1.45e-03	5.85e+02	1.63e+01
Tc-99	4.96e+02	5.51e+02	1.98e+02	0.00e+00	6.48e+03	1.25e+06	2.87e+04
Tc-99m	1.78e-03	3.48e-03	5.77e-02	0.00e+00	5.07e-02	9.51e+02	4.81e+03
Ru-103	2.79e+03	0.00e+00	1.07e+03	0.00e+00	7.03e+03	6.62e+05	4.48e+04
Ru-105	1.53e+00	0.00e+00	5.55e-01	0.00e+00	1.34e+00	1.59e+04	9.95e+04
Ru-106	1.36e+05	0.00e+00	1.69e+04	0.00e+00	1.84e+05	1.43e+07	4.29e+05
Rh-105	1.45e+01	7.77e+00	6.62e+00	0.00e+00	3.10e+01	2.89e+04	4.92e+04
Pd-107	0.00e+00	9.80e+02	9.29e+01	0.00e+00	7.29e+03	1.17e+05	2.69e+03
Pd-109	0.00e+00	5.48e+00	1.83e+00	0.00e+00	2.61e+01	2.28e+04	9.58e+04

Conversion factors are in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for Child age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Inhalation Pathway for Pi

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Ag-110m	1.69e+04	1.14e+04	9.14e+03	0.00e+00	2.12e+04	5.48e+06	1.00e+05
Ag-111	6.70e+02	2.10e+02	1.39e+02	0.00e+00	6.33e+02	2.86e+05	1.10e+05
Cd-113m	0.00e+00	1.82e+06	7.84e+04	0.00e+00	1.90e+06	2.57e+06	6.03e+04
Cd-115m	0.00e+00	2.92e+05	1.25e+04	0.00e+00	2.19e+05	2.17e+06	1.84e+05
Sn-123	4.77e+05	7.92e+03	1.55e+04	8.40e+03	0.00e+00	3.55e+06	1.50e+05
Sn-125	1.83e+04	3.68e+02	1.09e+03	3.81e+02	0.00e+00	8.99e+05	2.65e+05
Sn-126	2.31e+06	3.85e+04	8.73e+04	1.05e+04	0.00e+00	1.12e+07	6.03e+04
Sb-124	5.74e+04	7.40e+02	2.00e+04	1.26e+02	0.00e+00	3.24e+06	1.64e+05
Sb-125	9.84e+04	7.58e+02	2.07e+04	9.10e+01	0.00e+00	2.32e+06	4.03e+04
Sb-126	6.36e+03	9.69e+01	2.28e+03	3.70e+01	0.00e+00	1.06e+06	2.10e+05
Sb-127	5.03e+02	7.73e+00	1.74e+02	5.59e+00	0.00e+00	2.28e+05	1.41e+05
Te-125m	6.73e+03	2.33e+03	9.14e+02	1.92e+03	0.00e+00	4.77e+05	3.38e+04
Te-127	2.77e+00	9.51e-01	6.10e-01	1.96e+00	7.07e+00	1.00e+04	5.62e+04
Te-127m	2.49e+04	8.55e+03	3.02e+03	6.07e+03	6.36e+04	1.48e+06	7.14e+04
Te-129	9.77e-02	3.50e-02	2.38e-02	7.14e-02	2.57e-01	2.93e+03	2.55e+04
Te-129m	1.92e+04	6.84e+03	3.04e+03	6.33e+03	5.03e+04	1.76e+06	1.82e+05
Te-131	2.17e-02	8.44e-03	6.59e-03	1.70e-02	5.88e-02	2.05e+03	1.33e+03
Te-131m	1.34e+02	5.92e+01	5.07e+01	9.77e+01	4.00e+02	2.06e+05	3.08e+05
Te-132	4.81e+02	2.72e+02	2.63e+02	3.17e+02	1.77e+03	3.77e+05	1.38e+05
Te-133m	1.08e-01	5.59e-02	5.55e-02	8.58e-02	3.74e-01	5.92e+03	1.76e+04
Te-134	5.66e-02	3.26e-02	3.48e-02	4.59e-02	2.11e-01	4.55e+03	1.80e+03
I-129	3.88e+04	2.37e+04	2.11e+04	1.58e+07	4.00e+04	0.00e+00	7.96e+02
I-130	8.18e+03	1.64e+04	8.44e+03	1.85e+06	2.45e+04	0.00e+00	5.11e+03
I-131	4.81e+04	4.81e+04	2.73e+04	1.62e+07	7.88e+04	0.00e+00	2.84e+03
I-132	2.12e+03	4.07e+03	1.88e+03	1.94e+05	6.25e+03	0.00e+00	3.20e+03
I-133	1.66e+04	2.03e+04	7.70e+03	3.85e+06	3.38e+04	0.00e+00	5.48e+03
I-134	1.17e+03	2.16e+03	9.95e+02	5.07e+04	3.30e+03	0.00e+00	9.55e+02
I-135	4.92e+03	8.73e+03	4.14e+03	7.92e+05	1.34e+04	0.00e+00	4.44e+03
Cs-134	6.51e+05	1.01e+06	2.25e+05	0.00e+00	3.30e+05	1.21e+05	3.85e+03
Cs-134m	2.34e+02	3.30e+02	2.26e+02	0.00e+00	1.83e+02	3.09e+01	2.93e+02

Conversion factors are in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for Child age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Inhalation Pathway for P<sub>i</sub>

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Cs-135	2.31e+05	1.53e+05	1.65e+04	0.00e+00	5.66e+04	1.93e+04	8.03e+02
Cs-136	6.51e+04	1.71e+05	1.16e+05	0.00e+00	9.55e+04	1.45e+04	4.18e+03
Cs-137	9.06e+05	8.25e+05	1.28e+05	0.00e+00	2.82e+05	1.04e+05	3.62e+03
Cs-138	6.33e+02	8.40e+02	5.55e+02	0.00e+00	6.22e+02	6.81e+01	2.70e+02
Cs-139	4.03e+02	4.26e+02	2.15e+02	0.00e+00	3.36e+02	3.46e+01	2.68e-02
Ba-139	1.84e+00	9.84e-04	5.36e-02	0.00e+00	8.62e-04	5.77e+03	5.77e+04
Ba-140	7.40e+04	6.48e+01	4.33e+03	0.00e+00	2.11e+01	1.74e+06	1.02e+05
Ba-141	1.96e-01	1.09e-04	6.36e-03	0.00e+00	9.47e-05	2.92e+03	2.75e+02
Ba-142	5.00e-02	3.60e-05	2.79e-03	0.00e+00	2.91e-05	1.64e+03	2.74e+00
La-140	6.44e+02	2.25e+02	7.55e+01	0.00e+00	0.00e+00	1.83e+05	2.26e+05
La-141	8.44e+00	1.96e+00	4.26e-01	0.00e+00	0.00e+00	1.66e+04	1.62e+05
La-142	1.30e+00	4.11e-01	1.29e-01	0.00e+00	0.00e+00	8.70e+03	7.58e+04
Ce-141	3.92e+04	1.95e+04	2.90e+03	0.00e+00	8.55e+03	5.44e+05	5.66e+04
Ce-143	3.66e+02	1.99e+02	2.87e+01	0.00e+00	8.36e+01	1.15e+05	1.27e+05
Ce-144	6.77e+06	2.12e+06	3.61e+05	0.00e+00	1.17e+06	1.20e+07	3.88e+05
Pr-143	1.85e+04	5.55e+03	9.14e+02	0.00e+00	3.00e+03	4.33e+05	9.73e+04
Pr-144	5.96e-02	1.85e-02	3.00e-03	0.00e+00	9.77e-03	1.57e+03	1.97e+02
Nd-147	1.08e+04	8.73e+03	6.81e+02	0.00e+00	4.81e+03	3.28e+05	8.21e+04
Pm-147	1.30e+06	9.32e+04	5.03e+04	0.00e+00	1.65e+05	8.14e+05	2.11e+04
Pm-148	5.96e+03	7.18e+02	4.62e+02	0.00e+00	1.22e+03	4.59e+05	2.22e+05
Pm-148m	1.22e+05	2.42e+04	2.42e+04	0.00e+00	3.60e+04	2.12e+06	1.32e+05
Pm-149	5.44e+02	5.77e+01	3.13e+01	0.00e+00	1.02e+02	8.88e+04	1.08e+05
Pm-151	1.32e+02	1.60e+01	1.04e+01	0.00e+00	2.72e+01	4.59e+04	9.25e+04
Sm-151	1.16e+06	1.76e+05	5.51e+04	0.00e+00	1.81e+05	5.48e+05	1.27e+04
Sm-153	2.68e+02	1.67e+02	1.61e+01	0.00e+00	5.07e+01	5.07e+04	6.92e+04
Eu-152	2.75e+06	5.07e+05	5.96e+05	0.00e+00	2.12e+06	3.33e+06	4.22e+04
Eu-154	1.01e+07	9.21e+05	8.40e+05	0.00e+00	4.03e+06	6.14e+06	1.10e+05
Eu-155	2.07e+06	1.50e+05	1.18e+05	0.00e+00	5.59e+05	1.03e+06	1.99e+05
Eu-156	2.92e+04	1.57e+04	3.24e+03	0.00e+00	1.01e+04	9.40e+05	1.57e+05
Tb-160	2.88e+05	0.00e+00	3.58e+04	0.00e+00	8.58e+04	1.98e+06	8.44e+04

Conversion factors are in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for Child age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Inhalation Pathway for Pi

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Ho-166m	4.96e+06	1.04e+06	8.77e+05	0.00e+00	1.48e+06	4.18e+06	6.03e+04
W-181	9.84e+01	2.41e+01	3.33e+00	0.00e+00	0.00e+00	2.11e+04	9.66e+02
W-185	3.07e+03	7.70e+02	1.08e+02	0.00e+00	0.00e+00	6.88e+05	4.11e+04
W-187	1.63e+01	9.66e+00	4.33e+00	0.00e+00	0.00e+00	4.11e+04	9.10e+04
Pb-210	2.97e+08	6.84e+07	1.18e+07	0.00e+00	2.33e+08	3.23e+08	5.74e+03
Bi-210	3.64e+03	1.89e+04	2.09e+03	0.00e+00	2.13e+05	1.37e+07	1.19e+05
Po-210	6.29e+06	1.02e+07	1.51e+06	0.00e+00	3.27e+07	3.88e+08	1.60e+05
Ra-223	2.85e+06	3.29e+03	5.70e+05	0.00e+00	8.73e+04	3.14e+08	1.11e+06
Ra-224	3.12e+05	5.66e+02	6.25e+04	0.00e+00	1.50e+04	1.08e+08	1.24e+06
Ra-225	4.74e+06	4.22e+03	9.47e+05	0.00e+00	1.12e+05	3.60e+08	1.05e+06
Ra-226	8.66e+08	2.83e+04	7.10e+08	0.00e+00	7.51e+05	1.44e+09	1.12e+06
Ra-228	5.51e+08	1.46e+04	6.22e+08	0.00e+00	3.85e+05	1.99e+09	1.90e+05
Ac-225	6.70e+06	6.92e+06	4.48e+05	0.00e+00	7.36e+05	2.73e+08	9.88e+05
Ac-227	1.84e+10	2.98e+09	1.14e+09	0.00e+00	6.55e+08	2.97e+09	1.93e+05
Th-227	3.42e+06	4.66e+04	9.88e+04	0.00e+00	2.47e+05	4.66e+08	1.29e+06
Th-228	2.98e+09	3.85e+07	1.01e+08	0.00e+00	2.00e+08	1.24e+10	1.33e+06
Th-229	8.07e+10	2.12e+09	1.34e+09	0.00e+00	1.05e+10	4.00e+10	1.85e+05
Th-230	1.22e+10	6.40e+08	3.40e+08	0.00e+00	3.15e+09	6.84e+09	1.42e+05
Th-232	1.36e+10	5.44e+08	4.74e+06	0.00e+00	2.69e+09	6.55e+09	1.21e+05
Th-234	2.57e+04	1.14e+03	7.40e+02	0.00e+00	5.99e+03	2.33e+06	2.71e+05
Pa-231	3.19e+10	1.06e+09	1.27e+09	0.00e+00	5.77e+09	7.10e+08	1.69e+05
Pa-233	1.53e+04	2.40e+03	2.68e+03	0.00e+00	8.81e+03	3.61e+05	3.31e+04
U-232	8.10e+08	0.00e+00	5.77e+07	0.00e+00	6.18e+07	2.75e+09	1.60e+05
U-233	1.72e+08	0.00e+00	1.04e+07	0.00e+00	2.82e+07	6.55e+08	1.48e+05
U-234	1.65e+08	0.00e+00	1.02e+07	0.00e+00	2.76e+07	6.44e+08	1.45e+05
U-235	1.58e+08	0.00e+00	9.58e+06	0.00e+00	2.59e+07	6.03e+08	1.84e+05
U-236	1.58e+08	0.00e+00	9.80e+06	0.00e+00	2.65e+07	6.18e+08	1.36e+05
U-237	5.81e+02	0.00e+00	1.54e+02	0.00e+00	1.68e+03	1.26e+05	4.77e+04
U-238	1.51e+08	0.00e+00	8.95e+06	0.00e+00	2.42e+07	5.66e+08	1.30e+05
Np-237	1.01e+10	5.99e+09	4.40e+08	0.00e+00	2.74e+09	6.44e+08	1.87e+05

Conversion factors are in units of mrem/yr per uCi/cubic meter.



# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for Child age group by nuclide.

Waterford Steam Electric Station

Pathway : Inhalation Pathway for P<sub>i</sub>

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Np-238	4.66e+03	8.51e+02	7.29e+01	0.00e+00	3.02e+02	1.25e+05	9.25e+04
Np-239	4.66e+02	3.01e+02	2.35e+01	0.00e+00	9.73e+01	5.81e+04	6.40e+04
Pu-238	9.44e+09	5.92e+09	4.48e+08	0.00e+00	1.65e+09	2.25e+09	1.72e+05
Pu-239	1.03e+10	6.22e+09	4.74e+08	0.00e+00	1.77e+09	2.12e+09	1.57e+05
Pu-240	1.03e+10	6.22e+09	4.70e+08	0.00e+00	1.76e+09	2.11e+09	1.60e+05
Pu-241	2.94e+08	6.48e+07	1.08e+07	0.00e+00	4.07e+07	1.87e+06	3.29e+03
Pu-242	9.58e+09	5.99e+09	4.55e+08	0.00e+00	1.70e+09	2.04e+09	1.54e+05
Pu-244	1.12e+10	6.84e+09	5.22e+08	0.00e+00	1.95e+09	2.33e+09	2.29e+05
Am-241	1.10e+10	6.81e+09	4.59e+08	0.00e+00	2.82e+09	7.47e+08	1.75e+05
Am-242m	1.14e+10	6.51e+09	4.70e+08	0.00e+00	2.85e+09	3.01e+08	2.21e+05
Am-243	1.09e+10	6.59e+09	4.44e+08	0.00e+00	2.75e+09	7.10e+08	2.05e+05
Cm-242	3.51e+08	2.10e+08	1.55e+07	0.00e+00	4.96e+07	4.85e+08	1.67e+05
Cm-243	8.58e+09	5.25e+09	3.68e+08	0.00e+00	1.38e+09	7.77e+08	1.84e+05
Cm-244	7.18e+09	4.37e+09	3.07e+08	0.00e+00	1.13e+09	7.47e+08	1.78e+05
Cm-245	1.13e+10	6.81e+09	4.74e+08	0.00e+00	1.86e+09	7.22e+08	1.66e+05
Cm-246	1.12e+10	6.81e+09	4.74e+08	0.00e+00	1.86e+09	7.36e+08	1.63e+05
Cm-247	1.09e+10	6.73e+09	4.66e+08	0.00e+00	1.83e+09	7.22e+08	2.15e+05
Cm-248	9.06e+10	5.55e+10	3.85e+09	0.00e+00	1.51e+10	5.96e+09	3.46e+06
Cf-252	8.07e+09	0.00e+00	3.45e+08	0.00e+00	0.00e+00	2.45e+09	6.81e+05

Conversion factors are in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for Infant age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Inhalation Pathway for Pi

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
H-3	0.00e+00	3.68e+02	3.68e+02	3.68e+02	3.68e+02	3.68e+02	3.68e+02
Be-10	1.33e+06	1.75e+05	3.71e+04	0.00e+00	0.00e+00	2.09e+06	2.42e+04
C-14	2.65e+04	5.31e+03	5.31e+03	5.31e+03	5.31e+03	5.31e+03	5.31e+03
N-13	6.15e+01	6.15e+01	6.15e+01	6.15e+01	6.15e+01	6.15e+01	6.15e+01
F-18	5.49e+03	0.00e+00	4.66e+02	0.00e+00	0.00e+00	0.00e+00	8.54e+02
Na-22	1.03e+05	1.03e+05	1.03e+05	1.03e+05	1.03e+05	1.03e+05	1.03e+05
Na-24	1.06e+04	1.06e+04	1.06e+04	1.06e+04	1.06e+04	1.06e+04	1.06e+04
P-32	2.03e+06	1.12e+05	7.74e+04	0.00e+00	0.00e+00	0.00e+00	1.61e+04
Ca-41	1.05e+05	0.00e+00	1.14e+04	0.00e+00	0.00e+00	9.72e+07	4.14e+02
Sc-46	5.25e+05	7.57e+05	2.37e+05	0.00e+00	4.98e+05	0.00e+00	3.07e+04
Cr-51	0.00e+00	0.00e+00	8.95e+01	5.75e+01	1.32e+01	1.28e+04	3.57e+02
Mn-54	0.00e+00	2.53e+04	4.98e+03	0.00e+00	4.98e+03	1.00e+06	7.06e+03
Mn-56	0.00e+00	1.54e+00	2.21e-01	0.00e+00	1.10e+00	1.25e+04	7.17e+04
Fe-55	1.97e+04	1.17e+04	3.33e+03	0.00e+00	0.00e+00	8.69e+04	1.09e+03
Fe-59	1.36e+04	2.35e+04	9.48e+03	0.00e+00	0.00e+00	1.01e+06	2.48e+04
Co-57	0.00e+00	6.51e+02	6.41e+02	0.00e+00	0.00e+00	3.79e+05	4.86e+03
Co-58	0.00e+00	1.22e+03	1.82e+03	0.00e+00	0.00e+00	7.77e+05	1.11e+04
Co-60	0.00e+00	8.02e+03	1.18e+04	0.00e+00	0.00e+00	4.51e+06	3.19e+04
Ni-59	2.53e+04	7.62e+03	4.34e+03	0.00e+00	0.00e+00	7.67e+04	8.88e+02
Ni-63	3.39e+05	2.04e+04	1.16e+04	0.00e+00	0.00e+00	2.09e+05	2.42e+03
Ni-65	2.39e+00	2.84e-01	1.23e-01	0.00e+00	0.00e+00	8.12e+03	5.01e+04
Cu-64	0.00e+00	1.88e+00	7.74e-01	0.00e+00	3.98e+00	9.30e+03	1.50e+04
Zn-65	1.93e+04	6.26e+04	3.11e+04	0.00e+00	3.25e+04	6.47e+05	5.14e+04
Zn-69	5.39e-02	9.67e-02	7.18e-03	0.00e+00	4.02e-02	1.47e+03	1.32e+04
Zn-69m	1.26e+01	2.58e+01	2.34e+00	0.00e+00	1.04e+01	2.67e+04	4.09e+04
Se-79	0.00e+00	3.15e+03	5.88e+02	0.00e+00	3.46e+03	4.19e+05	4.84e+03
Br-82	0.00e+00	0.00e+00	1.33e+04	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Br-83	0.00e+00	0.00e+00	3.81e+02	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Br-84	0.00e+00	0.00e+00	4.00e+02	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Br-85	0.00e+00	0.00e+00	2.04e+01	0.00e+00	0.00e+00	0.00e+00	0.00e+00

Conversion factors are in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for Infant age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Inhalation Pathway for P<sub>i</sub>

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Rb-86	0.00e+00	1.90e+05	8.82e+04	0.00e+00	0.00e+00	0.00e+00	3.04e+03
Rb-87	0.00e+00	9.95e+04	3.70e+04	0.00e+00	0.00e+00	0.00e+00	4.19e+02
Rb-88	0.00e+00	5.57e+02	2.87e+02	0.00e+00	0.00e+00	0.00e+00	3.39e+02
Rb-89	0.00e+00	3.21e+02	2.06e+02	0.00e+00	0.00e+00	0.00e+00	6.82e+01
Sr-89	3.98e+05	0.00e+00	1.14e+04	0.00e+00	0.00e+00	2.03e+06	6.40e+04
Sr-90	1.55e+07	0.00e+00	3.12e+05	0.00e+00	0.00e+00	1.12e+07	1.31e+05
Sr-91	9.56e+01	0.00e+00	3.46e+00	0.00e+00	0.00e+00	5.26e+04	7.34e+04
Sr-92	1.05e+01	0.00e+00	3.91e-01	0.00e+00	0.00e+00	2.38e+04	1.40e+05
Y-90	3.29e+03	0.00e+00	8.82e+01	0.00e+00	0.00e+00	2.69e+05	1.04e+05
Y-91	5.88e+05	0.00e+00	1.57e+04	0.00e+00	0.00e+00	2.45e+06	7.03e+04
Y-91m	4.07e-01	0.00e+00	1.39e-02	0.00e+00	0.00e+00	2.79e+03	2.35e+03
Y-92	1.64e+01	0.00e+00	4.61e-01	0.00e+00	0.00e+00	2.45e+04	1.27e+05
Y-93	1.50e+02	0.00e+00	4.07e+00	0.00e+00	0.00e+00	7.64e+04	1.67e+05
Zr-93	3.14e+05	1.33e+04	8.65e+03	0.00e+00	4.47e+04	1.92e+05	2.07e+03
Zr-95	1.15e+05	2.79e+04	2.03e+04	0.00e+00	3.11e+04	1.75e+06	2.17e+04
Zr-97	1.50e+02	2.56e+01	1.17e+01	0.00e+00	2.59e+01	1.10e+05	1.40e+05
Nb-93m	1.93e+05	5.03e+04	1.61e+04	0.00e+00	5.15e+04	2.93e+05	3.46e+03
Nb-95	1.57e+04	6.43e+03	3.78e+03	0.00e+00	4.72e+03	4.79e+05	1.27e+04
Nb-97	3.42e-01	7.29e-02	2.63e-02	0.00e+00	5.70e-02	3.32e+03	2.69e+04
Mo-93	0.00e+00	9.04e+03	3.11e+02	0.00e+00	2.16e+03	4.76e+05	5.26e+03
Mo-99	0.00e+00	1.65e+02	3.23e+01	0.00e+00	2.65e+02	1.35e+05	4.87e+04
Tc-101	6.51e-05	8.23e-05	8.12e-04	0.00e+00	9.79e-04	5.84e+02	8.44e+02
Tc-99	2.93e+02	3.75e+02	1.24e+02	0.00e+00	3.49e+03	9.48e+05	1.09e+04
Tc-99m	1.40e-03	2.88e-03	3.72e-02	0.00e+00	3.11e-02	8.11e+02	2.03e+03
Ru-103	2.02e+03	0.00e+00	6.79e+02	0.00e+00	4.24e+03	5.52e+05	1.61e+04
Ru-105	1.22e+00	0.00e+00	4.10e-01	0.00e+00	8.99e-01	1.57e+04	4.84e+04
Ru-106	8.68e+04	0.00e+00	1.09e+04	0.00e+00	1.07e+05	1.16e+07	1.64e+05
Rh-105	1.16e+01	7.57e+00	5.08e+00	0.00e+00	2.10e+01	2.91e+04	1.92e+04
Pd-107	0.00e+00	6.89e+02	5.75e+01	0.00e+00	3.85e+03	8.88e+04	1.03e+03
Pd-109	0.00e+00	5.49e+00	1.47e+00	0.00e+00	1.79e+01	2.35e+04	3.99e+04

Conversion factors are in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for Infant age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Inhalation Pathway for Pi

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Ag-110m	9.98e+03	7.22e+03	5.00e+03	0.00e+00	1.09e+04	3.67e+06	3.30e+04
Ag-111	5.25e+02	2.03e+02	1.08e+02	0.00e+00	4.27e+02	2.88e+05	4.23e+04
Cd-113m	0.00e+00	9.34e+05	3.70e+04	0.00e+00	8.12e+05	1.96e+06	2.31e+04
Cd-115m	0.00e+00	2.42e+05	8.67e+03	0.00e+00	1.32e+05	2.06e+06	7.03e+04
Sn-123	2.93e+05	5.89e+03	1.02e+04	5.98e+03	0.00e+00	3.11e+06	5.71e+04
Sn-125	1.41e+04	3.51e+02	8.40e+02	3.46e+02	0.00e+00	9.00e+05	1.02e+05
Sn-126	1.16e+06	2.02e+04	4.93e+04	5.38e+03	0.00e+00	6.90e+06	2.31e+04
Sb-124	3.79e+04	5.56e+02	1.20e+04	1.01e+02	0.00e+00	2.65e+06	5.91e+04
Sb-125	5.17e+04	4.77e+02	1.09e+04	6.23e+01	0.00e+00	1.64e+06	1.47e+04
Sb-126	4.31e+03	8.41e+01	1.55e+03	3.29e+01	0.00e+00	9.63e+05	7.46e+04
Sb-127	3.95e+02	7.06e+00	1.23e+02	5.04e+00	0.00e+00	2.16e+05	5.29e+04
Te-125m	4.76e+03	1.99e+03	6.58e+02	1.62e+03	0.00e+00	4.47e+05	1.29e+04
Te-127	2.23e+00	9.53e-01	4.89e-01	1.85e+00	4.86e+00	1.03e+04	2.44e+04
Te-127m	1.67e+04	6.90e+03	2.07e+03	4.87e+03	3.75e+04	1.31e+06	2.73e+04
Te-129	7.88e-02	3.47e-02	1.88e-02	6.75e-02	1.75e-01	3.00e+03	2.63e+04
Te-129m	1.41e+04	6.09e+03	2.23e+03	5.47e+03	3.18e+04	1.68e+06	6.90e+04
Te-131	1.74e-02	8.22e-03	5.00e-03	1.58e-02	3.99e-02	2.06e+03	8.22e+03
Te-131m	1.07e+02	5.50e+01	3.63e+01	8.93e+01	2.65e+02	1.99e+05	1.19e+05
Te-132	3.72e+02	2.37e+02	1.76e+02	2.79e+02	1.03e+03	3.40e+05	4.41e+04
Te-133m	8.58e-02	5.03e-02	3.84e-02	7.73e-02	2.41e-01	5.49e+03	2.23e+04
Te-134	4.45e-02	2.86e-02	2.35e-02	4.07e-02	1.34e-01	4.10e+03	3.54e+03
I-129	3.02e+04	2.23e+04	1.62e+04	1.46e+07	2.63e+04	0.00e+00	2.97e+02
I-130	6.36e+03	1.39e+04	5.57e+03	1.60e+06	1.53e+04	0.00e+00	1.99e+03
I-131	3.79e+04	4.44e+04	1.96e+04	1.48e+07	5.18e+04	0.00e+00	1.06e+03
I-132	1.69e+03	3.54e+03	1.26e+03	1.69e+05	3.95e+03	0.00e+00	1.90e+03
I-133	1.32e+04	1.92e+04	5.60e+03	3.56e+06	2.24e+04	0.00e+00	2.16e+03
I-134	9.21e+02	1.88e+03	6.65e+02	4.45e+04	2.09e+03	0.00e+00	1.29e+03
I-135	3.86e+03	7.60e+03	2.77e+03	6.96e+05	8.47e+03	0.00e+00	1.83e+03
Cs-134	3.96e+05	7.03e+05	7.45e+04	0.00e+00	1.90e+05	7.97e+04	1.33e+03
Cs-134m	1.85e+02	2.94e+02	1.55e+02	0.00e+00	1.19e+02	2.80e+01	1.62e+02

Conversion factors are in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for Infant age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Inhalation Pathway for Pi

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Cs-135	1.40e+05	1.21e+05	6.62e+03	0.00e+00	3.61e+04	1.41e+04	3.05e+02
Cs-136	4.83e+04	1.35e+05	5.29e+04	0.00e+00	5.64e+04	1.18e+04	1.43e+03
Cs-137	5.49e+05	6.12e+05	4.55e+04	0.00e+00	1.72e+05	7.13e+04	1.33e+03
Cs-138	5.05e+02	7.81e+02	3.98e+02	0.00e+00	4.10e+02	6.54e+01	8.76e+02
Cs-139	3.25e+02	4.24e+02	1.71e+02	0.00e+00	2.31e+02	3.54e+01	1.86e+01
Ba-139	1.48e+00	9.84e-04	4.30e-02	0.00e+00	5.92e-04	5.95e+03	5.10e+04
Ba-140	5.60e+04	5.60e+01	2.90e+03	0.00e+00	1.34e+01	1.60e+06	3.84e+04
Ba-141	1.57e-01	1.08e-04	4.97e-03	0.00e+00	6.50e-05	2.97e+03	4.75e+03
Ba-142	3.98e-02	3.30e-05	1.96e-03	0.00e+00	1.90e-05	1.55e+03	6.93e+02
La-140	5.05e+02	2.00e+02	5.15e+01	0.00e+00	0.00e+00	1.68e+05	8.48e+04
La-141	6.79e+00	1.96e+00	3.43e-01	0.00e+00	0.00e+00	1.71e+04	8.34e+04
La-142	1.03e+00	3.77e-01	9.04e-02	0.00e+00	0.00e+00	8.22e+03	5.95e+04
Ce-141	2.77e+04	1.67e+04	1.99e+03	0.00e+00	5.25e+03	5.17e+05	2.16e+04
Ce-143	2.93e+02	1.93e+02	2.21e+01	0.00e+00	5.64e+01	1.16e+05	4.97e+04
Ce-144	3.19e+06	1.21e+06	1.76e+05	0.00e+00	5.38e+05	9.84e+06	1.48e+05
Pr-143	1.40e+04	5.24e+03	6.99e+02	0.00e+00	1.97e+03	4.33e+05	3.72e+04
Pr-144	4.79e-02	1.85e-02	2.41e-03	0.00e+00	6.72e-03	1.61e+03	4.28e+03
Nd-147	7.94e+03	8.13e+03	5.00e+02	0.00e+00	3.15e+03	3.22e+05	3.12e+04
Pm-147	5.47e+05	4.30e+04	2.18e+04	0.00e+00	6.90e+04	6.37e+05	8.05e+03
Pm-148	4.68e+03	6.75e+02	3.42e+02	0.00e+00	8.06e+02	4.48e+05	8.46e+04
Pm-148m	7.00e+04	1.74e+04	1.39e+04	0.00e+00	2.03e+04	1.71e+06	4.72e+04
Pm-149	4.34e+02	5.71e+01	2.49e+01	0.00e+00	6.94e+01	9.10e+04	4.21e+04
Pm-151	1.05e+02	1.54e+01	7.77e+00	0.00e+00	1.82e+01	4.55e+04	3.61e+04
Sm-151	4.73e+05	9.03e+04	2.28e+04	0.00e+00	7.34e+04	4.17e+05	4.84e+03
Sm-153	2.14e+02	1.65e+02	1.27e+01	0.00e+00	3.46e+01	5.18e+04	2.70e+04
Eu-152	1.10e+06	2.48e+05	2.41e+05	0.00e+00	8.32e+05	2.07e+06	1.38e+04
Eu-154	4.14e+06	4.84e+05	3.43e+05	0.00e+00	1.60e+06	4.27e+06	3.98e+04
Eu-155	8.36e+05	8.01e+04	4.84e+04	0.00e+00	2.21e+05	7.28e+05	7.27e+04
Eu-156	2.18e+04	1.34e+04	2.16e+03	0.00e+00	6.27e+03	8.57e+05	5.80e+04
Tb-160	1.57e+05	0.00e+00	1.96e+04	0.00e+00	4.48e+04	1.55e+06	3.00e+04

Conversion factors are in units of mrem/yr per uCi/cubic meter.

DOSE FACTORS DUE TO RADIONUCLIDES  
OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for Infant age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Inhalation Pathway for P<sub>i</sub>

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Ho-166m	2.03e+06	4.30e+05	3.51e+05	0.00e+00	5.91e+05	2.87e+06	2.31e+04
W-181	6.80e+01	2.04e+01	2.34e+00	0.00e+00	0.00e+00	1.86e+04	3.68e+02
W-185	2.20e+03	6.76e+02	7.81e+01	0.00e+00	0.00e+00	6.27e+05	1.57e+04
W-187	1.30e+01	9.02e+00	3.12e+00	0.00e+00	0.00e+00	3.96e+04	3.56e+04
Pb-210	1.21e+08	2.83e+07	4.80e+06	0.00e+00	9.59e+07	2.46e+08	2.20e+03
Bi-210	2.88e+03	1.86e+04	1.65e+03	0.00e+00	1.44e+05	1.39e+07	4.58e+04
Po-210	4.17e+06	7.88e+06	9.97e+05	0.00e+00	1.82e+07	3.36e+08	6.10e+04
Ra-223	2.18e+06	3.16e+03	4.37e+05	0.00e+00	5.82e+04	3.15e+08	4.26e+05
Ra-224	2.48e+05	5.60e+02	4.96e+04	0.00e+00	1.02e+04	1.11e+08	4.79e+05
Ra-225	3.60e+06	4.03e+03	7.18e+05	0.00e+00	7.43e+04	3.60e+08	4.02e+05
Ra-226	3.47e+08	2.04e+04	2.87e+08	0.00e+00	4.12e+05	1.10e+09	4.27e+05
Ra-228	2.24e+08	1.07e+04	2.52e+08	0.00e+00	2.14e+05	1.53e+09	7.27e+04
Ac-225	5.17e+06	6.61e+06	3.47e+05	0.00e+00	4.89e+05	2.74e+08	3.79e+05
Ac-227	7.41e+09	1.23e+09	4.59e+08	0.00e+00	2.60e+08	2.27e+09	7.38e+04
Th-227	2.55e+06	4.24e+04	7.34e+04	0.00e+00	1.58e+05	4.58e+08	4.94e+05
Th-228	1.18e+09	1.54e+07	4.00e+07	0.00e+00	7.85e+07	6.51e+09	5.07e+05
Th-229	3.19e+10	8.32e+08	5.33e+08	0.00e+00	1.30e+09	1.78e+10	7.03e+04
Th-230	4.84e+09	2.51e+08	1.35e+08	0.00e+00	1.23e+09	3.05e+09	5.42e+04
Th-232	5.40e+09	2.14e+08	3.21e+06	0.00e+00	1.06e+09	2.93e+09	4.61e+04
Th-234	1.86e+04	1.00e+03	5.38e+02	0.00e+00	3.78e+03	2.27e+06	1.04e+05
Pa-231	1.27e+10	4.20e+08	5.07e+08	0.00e+00	2.27e+09	5.39e+08	6.45e+04
Pa-233	9.58e+03	1.85e+03	1.67e+03	0.00e+00	5.15e+03	3.07e+05	1.27e+04
U-232	3.60e+08	0.00e+00	2.98e+07	0.00e+00	3.36e+07	2.09e+09	6.10e+04
U-233	7.62e+07	0.00e+00	5.36e+06	0.00e+00	1.53e+07	4.98e+08	5.64e+04
U-234	7.31e+07	0.00e+00	5.25e+06	0.00e+00	1.50e+07	4.89e+08	5.53e+04
U-235	7.01e+07	0.00e+00	4.93e+06	0.00e+00	1.41e+07	4.59e+08	7.03e+04
U-236	7.01e+07	0.00e+00	5.04e+06	0.00e+00	1.44e+07	4.69e+08	5.19e+04
U-237	4.55e+02	0.00e+00	1.21e+02	0.00e+00	1.13e+03	1.28e+05	1.83e+04
U-238	6.71e+07	0.00e+00	4.61e+06	0.00e+00	1.32e+07	4.28e+08	4.96e+04
Np-237	4.03e+09	2.39e+09	1.76e+08	0.00e+00	1.08e+09	4.89e+08	7.14e+04

Conversion factors are in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; P;

Pi factors for Infant age group by nuclide.

Waterford Steam Electric Station

Pathway : Inhalation Pathway for Pi

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Np-238	3.74e+03	8.47e+02	5.82e+01	0.00e+00	2.06e+02	1.29e+05	3.61e+04
Np-239	3.71e+02	2.98e+02	1.88e+01	0.00e+00	6.62e+01	5.95e+04	2.49e+04
Pu-238	3.77e+09	2.35e+09	1.78e+08	0.00e+00	6.50e+08	1.26e+09	6.57e+04
Pu-239	4.10e+09	2.46e+09	1.88e+08	0.00e+00	6.93e+08	1.19e+09	5.99e+04
Pu-240	4.10e+09	2.45e+09	1.88e+08	0.00e+00	6.92e+08	1.19e+09	6.10e+04
Pu-241	1.18e+08	2.59e+07	4.35e+06	0.00e+00	1.61e+07	1.07e+06	1.26e+03
Pu-242	3.81e+09	2.37e+09	1.81e+08	0.00e+00	6.68e+08	1.14e+09	5.88e+04
Pu-244	4.44e+09	2.72e+09	2.07e+08	0.00e+00	7.64e+08	1.31e+09	8.76e+04
Am-241	4.41e+09	2.73e+09	1.83e+08	0.00e+00	1.11e+09	5.68e+08	6.69e+04
Am-242m	4.55e+09	2.60e+09	1.89e+08	0.00e+00	1.12e+09	2.30e+08	8.41e+04
Am-243	4.34e+09	2.63e+09	1.78e+08	0.00e+00	1.08e+09	5.39e+08	7.84e+04
Cm-242	1.79e+08	1.21e+08	7.98e+06	0.00e+00	2.37e+07	4.16e+08	7.14e+04
Cm-243	3.46e+09	2.13e+09	1.48e+08	0.00e+00	5.47e+08	5.94e+08	7.03e+04
Cm-244	2.90e+09	1.78e+09	1.24e+08	0.00e+00	4.49e+08	5.71e+08	6.80e+04
Cm-245	4.51e+09	2.74e+09	1.90e+08	0.00e+00	7.32e+08	5.49e+08	6.34e+04
Cm-246	4.48e+09	2.74e+09	1.90e+08	0.00e+00	7.32e+08	5.59e+08	6.23e+04
Cm-247	4.35e+09	2.70e+09	1.86e+08	0.00e+00	7.21e+08	5.49e+08	8.19e+04
Cm-248	3.61e+10	2.23e+10	1.54e+09	0.00e+00	5.94e+09	4.52e+09	1.32e+06
Cf-252	3.32e+09	0.00e+00	1.41e+08	0.00e+00	0.00e+00	1.92e+09	2.59e+05

Conversion factors are in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for Adult age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Cow's Milk (food) Pathway for Pi

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
H-3	0.00e+00	4.35e+02	4.35e+02	4.35e+02	4.35e+02	4.35e+02	4.35e+02
Be-10	2.46e+06	3.79e+05	6.14e+04	0.00e+00	2.87e+05	0.00e+00	2.07e+07
C-14	2.63e+08	5.27e+07	5.27e+07	5.27e+07	5.27e+07	5.27e+07	5.27e+07
N-13	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
F-18	4.65e-03	0.00e+00	5.15e-04	0.00e+00	0.00e+00	0.00e+00	1.38e-04
Na-22	5.29e+09	5.29e+09	5.29e+09	5.29e+09	5.29e+09	5.29e+09	5.29e+09
Na-24	2.44e+06	2.44e+06	2.44e+06	2.44e+06	2.44e+06	2.44e+06	2.44e+06
P-32	1.71e+10	1.06e+09	6.61e+08	0.00e+00	0.00e+00	0.00e+00	1.92e+09
Ca-41	1.14e+10	0.00e+00	1.24e+09	0.00e+00	0.00e+00	0.00e+00	1.14e+07
Sc-46	1.79e+02	3.48e+02	1.01e+02	0.00e+00	3.25e+02	0.00e+00	1.70e+06
Cr-51	0.00e+00	0.00e+00	2.86e+04	1.71e+04	6.30e+03	3.79e+04	7.19e+06
Mn-54	0.00e+00	8.41e+06	1.61e+06	0.00e+00	2.50e+06	0.00e+00	2.58e+07
Mn-56	0.00e+00	4.15e-03	7.37e-04	0.00e+00	5.27e-03	0.00e+00	1.33e-01
Fe-55	2.51e+07	1.73e+07	4.05e+06	0.00e+00	0.00e+00	9.68e+06	9.95e+06
Fe-59	2.97e+07	6.98e+07	2.68e+07	0.00e+00	0.00e+00	1.95e+07	2.33e+08
Co-57	0.00e+00	1.28e+06	2.13e+06	0.00e+00	0.00e+00	0.00e+00	3.25e+07
Co-58	0.00e+00	4.71e+06	1.06e+07	0.00e+00	0.00e+00	0.00e+00	9.55e+07
Co-60	0.00e+00	1.64e+07	3.62e+07	0.00e+00	0.00e+00	0.00e+00	3.08e+08
Ni-59	5.05e+08	1.73e+08	8.44e+07	0.00e+00	0.00e+00	0.00e+00	3.57e+07
Ni-63	6.73e+09	4.66e+08	2.26e+08	0.00e+00	0.00e+00	0.00e+00	9.73e+07
Ni-65	3.76e-01	4.88e-02	2.23e-02	0.00e+00	0.00e+00	0.00e+00	1.24e+00
Cu-64	0.00e+00	2.39e+04	1.12e+04	0.00e+00	6.03e+04	0.00e+00	2.04e+06
Zn-65	1.37e+09	4.37e+09	1.97e+09	0.00e+00	2.92e+09	0.00e+00	2.75e+09
Zn-69	2.18e-12	4.17e-12	2.90e-13	0.00e+00	2.71e-12	0.00e+00	6.26e-13
Zn-69m	1.81e+05	4.35e+05	3.98e+04	0.00e+00	2.64e+05	0.00e+00	2.66e+07
Sa-79	0.00e+00	9.15e+08	1.53e+08	0.00e+00	1.58e+09	0.00e+00	1.87e+08
Br-82	0.00e+00	0.00e+00	3.23e+07	0.00e+00	0.00e+00	0.00e+00	3.70e+07
Br-83	0.00e+00	0.00e+00	9.87e-02	0.00e+00	0.00e+00	0.00e+00	1.42e-01
Br-84	0.00e+00	0.00e+00	1.73e-23	0.00e+00	0.00e+00	0.00e+00	1.36e-28
Br-85	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.



# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for Adult age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Cow's Milk (food) Pathway for Pi

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Rb-86	0.00e+00	2.59e+09	1.21e+09	0.00e+00	0.00e+00	0.00e+00	5.12e+08
Rb-87	0.00e+00	2.85e+09	9.92e+08	0.00e+00	0.00e+00	0.00e+00	1.34e+08
Rb-88	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
Sr-89	1.45e+09	0.00e+00	4.16e+07	0.00e+00	0.00e+00	0.00e+00	2.33e+08
Sr-90	5.38e+10	0.00e+00	1.08e+09	0.00e+00	0.00e+00	0.00e+00	1.35e+09
Sr-91	2.90e+04	0.00e+00	1.17e+03	0.00e+00	0.00e+00	0.00e+00	1.38e+05
Sr-92	4.95e-01	0.00e+00	2.14e-02	0.00e+00	0.00e+00	0.00e+00	9.81e+00
Y-90	7.09e+01	0.00e+00	1.90e+00	0.00e+00	0.00e+00	0.00e+00	7.52e+05
Y-91	8.59e+03	0.00e+00	2.30e+02	0.00e+00	0.00e+00	0.00e+00	4.73e+06
Y-91m	6.27e-20	0.00e+00	2.43e-21	0.00e+00	0.00e+00	0.00e+00	1.84e-19
Y-92	5.64e-05	0.00e+00	1.65e-06	0.00e+00	0.00e+00	0.00e+00	9.88e-01
Y-93	2.24e-01	0.00e+00	6.19e-03	0.00e+00	0.00e+00	0.00e+00	7.11e+03
Zr-93	1.62e+03	9.04e+01	4.21e+01	0.00e+00	3.43e+02	0.00e+00	9.39e+04
Zr-95	9.43e+02	3.03e+02	2.05e+02	0.00e+00	4.75e+02	0.00e+00	9.59e+05
Zr-97	4.34e-01	8.76e-02	4.01e-02	0.00e+00	1.32e-01	0.00e+00	2.71e+04
Nb-93m	4.91e+05	1.60e+05	3.95e+04	0.00e+00	1.84e+05	0.00e+00	7.40e+07
Nb-95	8.26e+04	4.59e+04	2.47e+04	0.00e+00	4.54e+04	0.00e+00	2.79e+08
Nb-97	6.58e-12	1.66e-12	6.07e-13	0.00e+00	1.94e-12	0.00e+00	6.14e-09
Mo-93	0.00e+00	4.35e+08	1.18e+07	0.00e+00	1.23e+08	0.00e+00	7.07e+07
Mo-99	0.00e+00	2.48e+07	4.72e+06	0.00e+00	5.61e+07	0.00e+00	5.74e+07
Tc-101	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Tc-99	2.42e+07	3.59e+07	9.70e+06	0.00e+00	4.52e+08	3.05e+06	1.17e+09
Tc-99m	3.34e+00	9.44e+00	1.20e+02	0.00e+00	1.43e+02	4.63e+00	5.59e+03
Ru-103	1.02e+03	0.00e+00	4.39e+02	0.00e+00	3.89e+03	0.00e+00	1.19e+05
Ru-105	8.64e-04	0.00e+00	3.41e-04	0.00e+00	1.12e-02	0.00e+00	5.29e-01
Ru-106	2.04e+04	0.00e+00	2.58e+03	0.00e+00	3.94e+04	0.00e+00	1.32e+06
Rh-105	3.46e+05	2.53e+05	1.67e+05	0.00e+00	1.08e+06	0.00e+00	4.03e+07
Pd-107	0.00e+00	1.14e+07	7.26e+05	0.00e+00	1.02e+08	0.00e+00	7.04e+07
Pd-109	0.00e+00	4.49e+04	1.01e+04	0.00e+00	2.56e+05	0.00e+00	4.98e+06

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for Adult age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Cow's Milk (food) Pathway for P<sub>i</sub>

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Ag-110m	5.82e+07	5.39e+07	3.20e+07	0.00e+00	1.06e+08	0.00e+00	2.20e+10
Ag-111	6.47e+06	2.71e+06	1.35e+06	0.00e+00	8.74e+06	0.00e+00	4.97e+09
Cd-113m	0.00e+00	2.94e+06	9.43e+04	0.00e+00	3.24e+06	0.00e+00	2.37e+07
Cd-115m	0.00e+00	1.26e+06	4.02e+04	0.00e+00	9.99e+05	0.00e+00	5.30e+07
Sn-123	5.36e+08	8.88e+06	1.31e+07	7.55e+06	0.00e+00	0.00e+00	1.09e+09
Sn-125	5.68e+07	1.14e+06	2.58e+06	9.47e+05	0.00e+00	0.00e+00	7.09e+08
Sn-126	1.63e+09	3.23e+07	4.64e+07	9.51e+06	0.00e+00	0.00e+00	4.69e+08
Sb-124	2.57e+07	4.86e+05	1.02e+07	6.24e+04	0.00e+00	2.00e+07	7.31e+08
Sb-125	2.04e+07	2.28e+05	4.86e+06	2.08e+04	0.00e+00	1.58e+07	2.25e+08
Sb-126	5.63e+06	1.15e+05	2.03e+06	3.45e+04	0.00e+00	3.45e+06	4.60e+08
Sb-127	4.53e+05	9.93e+03	1.74e+05	5.45e+03	0.00e+00	2.69e+05	1.04e+08
Te-125m	1.63e+07	5.90e+06	2.18e+06	4.90e+06	6.63e+07	0.00e+00	6.50e+07
Te-127	6.56e+02	2.35e+02	1.42e+02	4.86e+02	2.67e+03	0.00e+00	5.17e+04
Te-127m	4.58e+07	1.64e+07	5.58e+06	1.17e+07	1.86e+08	0.00e+00	1.53e+08
Te-129	2.92e-10	1.10e-10	7.11e-11	2.24e-10	1.23e-09	0.00e+00	2.20e-10
Te-129m	6.02e+07	2.25e+07	9.53e+06	2.07e+07	2.51e+08	0.00e+00	3.03e+08
Te-131	3.95e-33	1.65e-33	1.25e-33	3.25e-33	1.73e-32	0.00e+00	5.60e-34
Te-131m	3.62e+05	1.77e+05	1.47e+05	2.80e+05	1.79e+06	0.00e+00	1.76e+07
Te-132	2.40e+06	1.55e+06	1.46e+06	1.72e+06	1.50e+07	0.00e+00	7.35e+07
Te-133m	2.19e-13	1.28e-13	1.24e-13	1.86e-13	1.27e-12	0.00e+00	4.40e-14
Te-134	9.41e-19	6.16e-19	3.78e-19	8.22e-19	5.95e-18	0.00e+00	1.04e-21
I-129	7.58e+08	6.51e+08	2.14e+09	1.68e+12	1.40e+09	0.00e+00	1.03e+08
I-130	4.21e+05	1.24e+06	4.90e+05	1.05e+08	1.94e+06	0.00e+00	1.07e+06
I-131	2.96e+08	4.24e+08	2.43e+08	1.39e+11	7.26e+08	0.00e+00	1.12e+08
I-132	1.67e-01	4.47e-01	1.56e-01	1.56e+01	7.12e-01	0.00e+00	8.39e-02
I-133	3.88e+06	6.74e+06	2.05e+06	9.91e+08	1.18e+07	0.00e+00	6.06e+06
I-134	2.11e-12	5.72e-12	2.05e-12	9.92e-11	9.10e-12	0.00e+00	4.99e-15
I-135	1.29e+04	3.38e+04	1.25e+04	2.23e+06	5.42e+04	0.00e+00	3.82e+04
Cs-134	5.65e+09	1.34e+10	1.10e+10	0.00e+00	4.35e+09	1.44e+09	2.35e+08
Cs-134m	1.76e-01	3.70e-01	1.89e-01	0.00e+00	2.01e-01	3.16e-02	1.31e-01

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for Adult age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Cow's Milk (food) Pathway for P<sub>i</sub>

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Cs-135	1.81e+09	1.67e+09	7.41e+08	0.00e+00	6.32e+08	1.89e+08	3.90e+07
Cs-136	2.63e+08	1.04e+09	7.48e+08	0.00e+00	5.78e+08	7.93e+07	1.18e+08
Cs-137	7.38e+09	1.01e+10	6.61e+09	0.00e+00	3.43e+09	1.14e+09	1.95e+08
Cs-138	9.72e-24	1.92e-23	9.50e-24	0.00e+00	1.41e-23	1.39e-24	8.18e-29
Cs-139	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Ba-139	4.54e-08	3.24e-11	1.33e-09	0.00e+00	3.03e-11	1.84e-11	8.06e-08
Ba-140	2.69e+07	3.38e+04	1.76e+06	0.00e+00	1.15e+04	1.93e+04	5.54e+07
Ba-141	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	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
La-140	4.52e+00	2.28e+00	6.01e-01	0.00e+00	0.00e+00	0.00e+00	1.67e+05
La-141	3.00e-05	9.31e-06	1.52e-06	0.00e+00	0.00e+00	0.00e+00	1.11e+00
La-142	1.90e-11	8.66e-12	2.16e-12	0.00e+00	0.00e+00	0.00e+00	6.32e-08
Ce-141	4.84e+03	3.28e+03	3.72e+02	0.00e+00	1.52e+03	0.00e+00	1.25e+07
Ce-143	4.16e+01	3.08e+04	3.40e+00	0.00e+00	1.35e+01	0.00e+00	1.15e+06
Ce-144	3.58e+05	1.50e+05	1.92e+04	0.00e+00	8.87e+04	0.00e+00	1.21e+08
Pr-143	1.58e+02	6.33e+01	7.83e+00	0.00e+00	3.66e+01	0.00e+00	6.92e+05
Pr-144	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Nd-147	9.42e+01	1.09e+02	6.51e+00	0.00e+00	6.36e+01	0.00e+00	5.22e+05
Pm-147	2.87e+03	2.70e+02	1.09e+02	0.00e+00	5.10e+02	0.00e+00	3.40e+05
Pm-148	5.93e+01	9.85e+00	4.96e+00	0.00e+00	1.86e+01	0.00e+00	7.74e+05
Pm-148m	8.57e+02	2.22e+02	1.70e+02	0.00e+00	3.35e+02	0.00e+00	1.88e+06
Pm-149	4.28e+00	6.05e-01	2.47e-01	0.00e+00	1.14e+00	0.00e+00	1.13e+05
Pm-151	6.47e-01	1.09e-01	5.48e-02	0.00e+00	1.94e-01	0.00e+00	2.99e+04
Sm-151	2.67e+03	4.60e+02	1.10e+02	0.00e+00	5.14e+02	0.00e+00	2.03e+05
Sm-153	1.99e+00	1.66e+00	1.21e-01	0.00e+00	5.36e-01	0.00e+00	5.92e+04
Eu-152	7.51e+03	1.71e+03	1.50e+03	0.00e+00	1.06e+04	0.00e+00	9.86e+05
Eu-154	2.38e+04	2.92e+03	2.08e+03	0.00e+00	1.40e+04	0.00e+00	2.12e+06
Eu-155	3.25e+03	4.61e+02	2.97e+02	0.00e+00	2.13e+03	0.00e+00	3.62e+05
Eu-156	2.52e+02	1.95e+02	3.14e+01	0.00e+00	1.30e+02	0.00e+00	1.33e+06
Tb-160	1.49e+03	0.00e+00	1.86e+02	0.00e+00	6.16e+02	0.00e+00	1.37e+06

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for Adult age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Cow's Milk (food) Pathway for P<sub>i</sub>

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Ho-166m	1.04e+04	3.26e+03	2.47e+03	0.00e+00	4.87e+03	0.00e+00	9.89e+05
W-181	3.39e+04	1.11e+04	1.18e+03	0.00e+00	0.00e+00	0.00e+00	1.26e+06
W-185	1.29e+06	4.32e+05	4.54e+04	0.00e+00	0.00e+00	0.00e+00	4.99e+07
W-187	6.52e+03	5.45e+03	1.91e+03	0.00e+00	0.00e+00	0.00e+00	1.79e+06
Pb-210	7.32e+10	2.09e+10	2.60e+09	0.00e+00	5.88e+10	0.00e+00	1.07e+07
Bi-210	3.56e+05	2.46e+06	2.04e+05	0.00e+00	2.96e+07	0.00e+00	3.67e+07
Po-210	7.42e+08	1.58e+09	1.79e+08	0.00e+00	5.25e+09	0.00e+00	1.33e+08
Ra-223	1.22e+11	1.88e+08	2.44e+10	0.00e+00	5.33e+09	0.00e+00	7.89e+09
Ra-224	1.41e+10	3.42e+07	2.83e+09	0.00e+00	9.65e+08	0.00e+00	2.98e+09
Ra-225	1.90e+11	2.25e+08	3.79e+10	0.00e+00	6.39e+09	0.00e+00	8.85e+09
Ra-226	1.87e+13	3.55e+08	1.36e+13	0.00e+00	1.01e+10	0.00e+00	2.05e+10
Ra-228	6.87e+12	1.91e+08	7.43e+12	0.00e+00	5.42e+09	0.00e+00	3.46e+09
Ac-225	6.17e+04	8.49e+04	4.15e+03	0.00e+00	9.67e+03	0.00e+00	5.70e+06
Ac-227	7.21e+07	9.56e+06	4.28e+06	0.00e+00	3.09e+06	0.00e+00	3.16e+06
Th-227	2.80e+05	5.06e+03	8.06e+03	0.00e+00	2.88e+04	0.00e+00	1.10e+07
Th-228	1.88e+07	3.18e+05	6.35e+05	0.00e+00	1.77e+06	0.00e+00	2.13e+07
Th-229	5.26e+08	1.50e+07	8.69e+06	0.00e+00	7.26e+07	0.00e+00	3.02e+06
Th-230	7.96e+07	4.52e+06	2.20e+06	0.00e+00	2.18e+07	0.00e+00	2.33e+06
Th-232	8.89e+07	3.86e+06	5.80e+04	0.00e+00	1.86e+07	0.00e+00	1.98e+06
Th-234	1.85e+03	1.09e+02	5.33e+01	0.00e+00	6.16e+02	0.00e+00	2.61e+06
Pa-231	1.58e+08	5.95e+06	6.14e+06	0.00e+00	3.34e+07	0.00e+00	2.77e+06
Pa-233	1.28e+02	2.58e+01	2.22e+01	0.00e+00	9.70e+01	0.00e+00	3.99e+05
U-232	1.59e+10	0.00e+00	1.14e+09	0.00e+00	1.73e+09	0.00e+00	2.62e+08
U-233	3.37e+09	0.00e+00	2.04e+08	0.00e+00	7.84e+08	0.00e+00	2.42e+08
U-234	3.23e+09	0.00e+00	2.00e+08	0.00e+00	7.69e+08	0.00e+00	2.37e+08
U-235	3.10e+09	0.00e+00	1.88e+08	0.00e+00	7.23e+08	0.00e+00	3.02e+08
U-236	3.10e+09	0.00e+00	1.92e+08	0.00e+00	7.38e+08	0.00e+00	2.23e+08
U-237	5.65e+04	0.00e+00	1.50e+04	0.00e+00	2.32e+05	0.00e+00	1.99e+07
U-238	2.96e+09	0.00e+00	1.75e+08	0.00e+00	6.76e+08	0.00e+00	2.13e+08
Np-237	4.87e+07	3.46e+06	2.14e+06	0.00e+00	1.59e+07	0.00e+00	3.07e+06

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for Adult age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Cow's Milk (food) Pathway for Pi

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-ILLI
Np-238	3.62e+01	9.75e-01	5.63e-01	0.00e+00	3.30e+00	0.00e+00	9.06e+04
Np-239	3.68e+00	3.61e-01	1.99e-01	0.00e+00	1.13e+00	0.00e+00	7.41e+04
Pu-238	9.73e+06	1.23e+06	2.64e+05	0.00e+00	1.13e+06	0.00e+00	1.13e+06
Pu-239	1.12e+07	1.35e+06	2.95e+05	0.00e+00	1.25e+06	0.00e+00	1.03e+06
Pu-240	1.12e+07	1.34e+06	2.95e+05	0.00e+00	1.25e+06	0.00e+00	1.05e+06
Pu-241	2.42e+05	1.15e+04	5.12e+03	0.00e+00	2.36e+04	0.00e+00	2.16e+04
Pu-242	1.04e+07	1.30e+06	2.84e+05	0.00e+00	1.21e+06	0.00e+00	1.01e+06
Pu-244	1.21e+07	1.49e+06	3.26e+05	0.00e+00	1.38e+06	0.00e+00	1.50e+06
Am-241	2.89e+07	2.70e+07	2.07e+06	0.00e+00	1.56e+07	0.00e+00	2.84e+06
Am-242m	2.94e+07	2.56e+07	2.10e+06	0.00e+00	1.56e+07	0.00e+00	3.61e+06
Am-243	2.91e+07	2.67e+07	2.05e+06	0.00e+00	1.54e+07	0.00e+00	3.36e+06
Cm-242	7.27e+05	7.73e+05	4.83e+04	0.00e+00	2.19e+05	0.00e+00	2.79e+06
Cm-243	2.31e+07	2.12e+07	1.45e+06	0.00e+00	6.75e+06	0.00e+00	3.01e+06
Cm-244	1.76e+07	1.65e+07	1.11e+06	0.00e+00	5.17e+06	0.00e+00	2.91e+06
Cm-245	3.62e+07	3.16e+07	2.23e+06	0.00e+00	1.04e+07	0.00e+00	2.72e+06
Cm-246	3.59e+07	3.15e+07	2.22e+06	0.00e+00	1.04e+07	0.00e+00	2.67e+06
Cm-247	3.50e+07	3.11e+07	2.19e+06	0.00e+00	1.02e+07	0.00e+00	3.51e+06
Cm-248	2.91e+08	2.56e+08	1.80e+07	0.00e+00	8.42e+07	0.00e+00	5.68e+07
Cf-252	9.92e+06	0.00e+00	2.39e+05	0.00e+00	0.00e+00	0.00e+00	1.09e+07

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for Teen age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Cow's Milk (food) Pathway for Pi

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
H-3	0.00e+00	5.66e+02	5.66e+02	5.66e+02	5.66e+02	5.66e+02	5.66e+02
Be-10	4.47e+06	6.92e+05	1.13e+05	0.00e+00	5.29e+05	0.00e+00	2.83e+07
C-14	4.86e+08	9.72e+07	9.72e+07	9.72e+07	9.72e+07	9.72e+07	9.72e+07
N-13	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
F-18	8.30e-03	0.00e+00	9.10e-04	0.00e+00	0.00e+00	0.00e+00	7.48e-04
Na-22	9.18e+09	9.18e+09	9.18e+09	9.18e+09	9.18e+09	9.18e+09	9.18e+09
Na-24	4.27e+06	4.27e+06	4.27e+06	4.27e+06	4.27e+06	4.27e+06	4.27e+06
P-32	3.15e+10	1.95e+09	1.22e+09	0.00e+00	0.00e+00	0.00e+00	2.65e+09
Ca-41	1.57e+10	0.00e+00	1.70e+09	0.00e+00	0.00e+00	0.00e+00	1.56e+07
Sc-46	3.04e+02	5.92e+02	1.76e+02	0.00e+00	5.67e+02	0.00e+00	2.02e+06
Cr-51	0.00e+00	0.00e+00	4.99e+04	2.77e+04	1.09e+04	7.13e+04	8.39e+06
Mn-54	0.00e+00	1.40e+07	2.78e+06	0.00e+00	4.18e+06	0.00e+00	2.87e+07
Mn-56	0.00e+00	7.36e-03	1.31e-03	0.00e+00	9.32e-03	0.00e+00	4.85e-01
Fe-55	4.45e+07	3.16e+07	7.36e+06	0.00e+00	0.00e+00	2.00e+07	1.37e+07
Fe-59	5.18e+07	1.21e+08	4.67e+07	0.00e+00	0.00e+00	3.81e+07	2.86e+08
Co-57	0.00e+00	2.24e+06	3.76e+06	0.00e+00	0.00e+00	0.00e+00	4.19e+07
Co-58	0.00e+00	7.94e+06	1.83e+07	0.00e+00	0.00e+00	0.00e+00	1.09e+08
Co-60	0.00e+00	2.78e+07	6.26e+07	0.00e+00	0.00e+00	0.00e+00	3.62e+08
Ni-59	8.82e+08	3.11e+08	1.50e+08	0.00e+00	0.00e+00	0.00e+00	4.88e+07
Ni-63	1.18e+10	8.35e+08	4.01e+08	0.00e+00	0.00e+00	0.00e+00	1.33e+08
Ni-65	6.87e-01	8.78e-02	4.00e-02	0.00e+00	0.00e+00	0.00e+00	4.76e+00
Cu-64	0.00e+00	4.26e+04	2.00e+04	0.00e+00	1.08e+05	0.00e+00	3.30e+06
Zn-65	2.11e+09	7.32e+09	3.41e+09	0.00e+00	4.68e+09	0.00e+00	3.10e+09
Zn-69	4.01e-12	7.65e-12	5.35e-13	0.00e+00	5.00e-12	0.00e+00	1.41e-11
Zn-69m	3.30e+05	7.79e+05	7.15e+04	0.00e+00	4.74e+05	0.00e+00	4.28e+07
Se-79	0.00e+00	1.67e+09	2.81e+08	0.00e+00	2.92e+09	0.00e+00	2.56e+08
Br-82	0.00e+00	0.00e+00	5.61e+07	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Br-83	0.00e+00	0.00e+00	1.82e-01	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Br-84	0.00e+00	0.00e+00	3.09e-23	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

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for Teen age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Cow's Milk (food) Pathway for Pi

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Rb-86	0.00e+00	4.73e+09	2.22e+09	0.00e+00	0.00e+00	0.00e+00	7.00e+08
Rb-87	0.00e+00	5.24e+09	1.83e+09	0.00e+00	0.00e+00	0.00e+00	1.83e+08
Rb-88	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
Sr-89	2.67e+09	0.00e+00	7.66e+07	0.00e+00	0.00e+00	0.00e+00	3.19e+08
Sr-90	8.13e+10	0.00e+00	1.63e+09	0.00e+00	0.00e+00	0.00e+00	1.86e+09
Sr-91	5.33e+04	0.00e+00	2.12e+03	0.00e+00	0.00e+00	0.00e+00	2.42e+05
Sr-92	9.07e-01	0.00e+00	3.86e-02	0.00e+00	0.00e+00	0.00e+00	2.31e+01
Y-90	1.30e+02	0.00e+00	3.51e+00	0.00e+00	0.00e+00	0.00e+00	1.07e+06
Y-91	1.58e+04	0.00e+00	4.24e+02	0.00e+00	0.00e+00	0.00e+00	6.48e+06
Y-91m	1.15e-19	0.00e+00	4.39e-21	0.00e+00	0.00e+00	0.00e+00	5.42e-18
Y-92	1.04e-04	0.00e+00	3.01e-06	0.00e+00	0.00e+00	0.00e+00	2.86e+00
Y-93	4.13e-01	0.00e+00	1.13e-02	0.00e+00	0.00e+00	0.00e+00	1.26e+04
Zr-93	2.76e+03	1.36e+02	7.43e+01	0.00e+00	4.81e+02	0.00e+00	1.29e+05
Zr-95	1.65e+03	5.20e+02	3.58e+02	0.00e+00	7.65e+02	0.00e+00	1.20e+06
Zr-97	7.90e-01	1.56e-01	7.20e-02	0.00e+00	2.37e-01	0.00e+00	4.23e+04
Nb-93m	8.55e+05	2.81e+05	7.03e+04	0.00e+00	3.28e+05	0.00e+00	1.01e+08
Nb-95	1.41e+05	7.81e+04	4.30e+04	0.00e+00	7.57e+04	0.00e+00	3.34e+08
Nb-97	1.20e-11	2.98e-12	1.09e-12	0.00e+00	3.48e-12	0.00e+00	7.11e-08
Mo-93	0.00e+00	7.93e+08	2.17e+07	0.00e+00	2.27e+08	0.00e+00	9.65e+07
Mo-99	0.00e+00	4.47e+07	8.53e+06	0.00e+00	1.02e+08	0.00e+00	8.01e+07
Tc-101	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Tc-99	4.46e+07	6.56e+07	1.79e+07	0.00e+00	8.33e+08	6.78e+06	1.61e+09
Tc-99m	5.80e+00	1.62e+01	2.10e+02	0.00e+00	2.41e+02	8.97e+00	1.06e+04
Ru-103	1.81e+03	0.00e+00	7.74e+02	0.00e+00	6.38e+03	0.00e+00	1.51e+05
Ru-105	1.58e-03	0.00e+00	6.13e-04	0.00e+00	1.99e-02	0.00e+00	1.27e+00
Ru-106	3.75e+04	0.00e+00	4.73e+03	0.00e+00	7.24e+04	0.00e+00	1.80e+06
Rh-105	6.38e+05	4.61e+05	3.03e+05	0.00e+00	1.96e+06	0.00e+00	5.87e+07
Pd-107	0.00e+00	2.07e+07	1.34e+06	0.00e+00	1.87e+08	0.00e+00	9.63e+07
Pd-109	0.00e+00	8.22e+04	1.87e+04	0.00e+00	4.75e+05	0.00e+00	8.29e+06

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for Teen age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Cow's Milk (food) Pathway for P<sub>i</sub>

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Ag-110m	9.63e+07	9.11e+07	5.54e+07	0.00e+00	1.74e+08	0.00e+00	2.56e+10
Ag-111	1.19e+07	4.95e+06	2.49e+06	0.00e+00	1.61e+07	0.00e+00	6.90e+09
Cd-113m	0.00e+00	5.38e+06	1.73e+05	0.00e+00	5.95e+06	0.00e+00	3.23e+07
Cd-115m	0.00e+00	2.30e+06	7.41e+04	0.00e+00	1.84e+06	0.00e+00	7.27e+07
Sn-123	9.88e+08	1.62e+07	2.40e+07	1.30e+07	0.00e+00	0.00e+00	1.49e+09
Sn-125	1.05e+08	2.08e+06	4.72e+06	1.64e+06	0.00e+00	0.00e+00	9.85e+08
Sn-126	2.89e+09	5.38e+07	8.23e+07	1.42e+07	0.00e+00	0.00e+00	6.43e+08
Sb-124	4.59e+07	8.46e+05	1.79e+07	1.04e+05	0.00e+00	4.01e+07	9.25e+08
Sb-125	3.65e+07	3.99e+05	8.55e+06	3.49e+04	0.00e+00	3.21e+07	2.84e+08
Sb-126	1.00e+07	2.05e+05	3.61e+06	5.68e+04	0.00e+00	7.20e+06	5.94e+08
Sb-127	8.23e+05	1.76e+04	3.11e+05	9.25e+03	0.00e+00	5.60e+05	1.40e+08
Te-125m	3.00e+07	1.08e+07	4.02e+06	8.39e+06	0.00e+00	0.00e+00	8.86e+07
Te-127	1.22e+03	4.31e+02	2.61e+02	8.38e+02	4.92e+03	0.00e+00	9.38e+04
Te-127m	8.44e+07	2.99e+07	1.00e+07	2.01e+07	3.42e+08	0.00e+00	2.10e+08
Te-129	5.37e-10	2.00e-10	1.31e-10	3.84e-10	2.25e-09	0.00e+00	2.94e-09
Te-129m	1.10e+08	4.09e+07	1.74e+07	3.55e+07	4.61e+08	0.00e+00	4.13e+08
Te-131	7.22e-33	2.98e-33	2.26e-33	5.57e-33	3.16e-32	0.00e+00	5.93e-34
Te-131m	6.58e+05	3.15e+05	2.63e+05	4.75e+05	3.29e+06	0.00e+00	2.53e+07
Te-132	4.29e+06	2.72e+06	2.56e+06	2.87e+06	2.61e+07	0.00e+00	8.61e+07
Te-133m	3.95e-13	2.24e-13	2.18e-13	3.13e-13	2.22e-12	0.00e+00	9.07e-13
Te-134	1.68e-18	1.08e-18	1.12e-18	1.38e-18	1.03e-17	0.00e+00	6.22e-20
I-129	1.39e+09	1.17e+09	1.96e+09	1.43e+12	2.10e+09	0.00e+00	1.37e+08
I-130	7.41e+05	2.14e+06	8.56e+05	1.75e+08	3.30e+06	0.00e+00	1.65e+06
I-131	5.37e+08	7.52e+08	4.04e+08	2.20e+11	1.30e+09	0.00e+00	1.49e+08
I-132	2.96e-01	7.75e-01	2.78e-01	2.61e+01	1.22e+00	0.00e+00	3.38e-01
I-133	7.08e+06	1.20e+07	3.66e+06	1.68e+09	2.11e+07	0.00e+00	9.09e+06
I-134	3.74e-12	9.92e-12	3.56e-12	1.65e-10	1.56e-11	0.00e+00	1.31e-13
I-135	2.29e+04	5.90e+04	2.19e+04	3.80e+06	9.33e+04	0.00e+00	6.54e+04
Cs-134	9.81e+09	2.31e+10	1.07e+10	0.00e+00	7.34e+09	2.80e+09	2.87e+08
Cs-134m	3.13e-01	6.49e-01	3.34e-01	0.00e+00	3.61e-01	6.34e-02	4.32e-01

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.



# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for Teen age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Cow's Milk (food) Pathway for Pi

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Cs-135	3.33e+09	3.05e+09	7.13e+08	0.00e+00	1.16e+09	4.21e+08	5.34e+07
Cs-136	4.48e+08	1.76e+09	1.18e+09	0.00e+00	9.60e+08	1.51e+08	1.42e+08
Cs-137	1.34e+10	1.78e+10	6.20e+09	0.00e+00	6.06e+09	2.35e+09	2.53e+08
Cs-138	1.76e-23	3.38e-23	1.69e-23	0.00e+00	2.50e-23	2.91e-24	1.54e-26
Cs-139	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Ba-139	8.40e-08	5.91e-11	2.45e-09	0.00e+00	5.57e-11	4.07e-11	7.50e-07
Ba-140	4.85e+07	5.95e+04	3.13e+06	0.00e+00	2.02e+04	4.00e+04	7.48e+07
Ba-141	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	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
La-140	8.11e+00	3.99e+00	1.06e+00	0.00e+00	0.00e+00	0.00e+00	2.29e+05
La-141	5.52e-05	1.70e-05	2.80e-06	0.00e+00	0.00e+00	0.00e+00	3.01e+00
La-142	3.43e-11	1.53e-11	3.80e-12	0.00e+00	0.00e+00	0.00e+00	4.64e-07
Ce-141	8.88e+03	5.93e+03	6.81e+02	0.00e+00	2.79e+03	0.00e+00	1.70e+07
Ce-143	7.65e+01	5.56e+04	6.21e+00	0.00e+00	2.50e+01	0.00e+00	1.67e+06
Ce-144	6.58e+05	2.72e+05	3.54e+04	0.00e+00	1.63e+05	0.00e+00	1.66e+08
Pr-143	2.90e+02	1.16e+02	1.44e+01	0.00e+00	6.73e+01	0.00e+00	9.55e+05
Pr-144	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Nd-147	1.81e+02	1.97e+02	1.18e+01	0.00e+00	1.16e+02	0.00e+00	7.11e+05
Pm-147	5.15e+03	4.89e+02	1.99e+02	0.00e+00	9.32e+02	0.00e+00	4.65e+05
Pm-148	1.09e+02	1.77e+01	8.93e+00	0.00e+00	3.20e+01	0.00e+00	1.06e+06
Pm-148m	1.49e+03	3.78e+02	2.96e+02	0.00e+00	5.73e+02	0.00e+00	2.38e+06
Pm-149	7.88e+00	1.11e+00	4.54e-01	0.00e+00	2.11e+00	0.00e+00	1.63e+05
Pm-151	1.18e+00	1.95e-01	9.88e-02	0.00e+00	3.51e-01	0.00e+00	4.38e+04
Sm-151	4.35e+03	8.37e+02	1.96e+02	0.00e+00	9.17e+02	0.00e+00	2.84e+05
Sm-153	3.65e+00	3.02e+00	2.22e-01	0.00e+00	9.88e-01	0.00e+00	8.53e+04
Eu-152	1.22e+04	2.93e+03	2.58e+03	0.00e+00	1.36e+04	0.00e+00	1.08e+06
Eu-154	3.94e+04	5.08e+03	3.58e+03	0.00e+00	2.27e+04	0.00e+00	2.69e+06
Eu-155	8.48e+03	8.18e+02	5.07e+02	0.00e+00	3.20e+03	0.00e+00	4.69e+06
Eu-156	4.55e+02	3.41e+02	5.57e+01	0.00e+00	2.30e+02	0.00e+00	1.74e+06
Tb-160	2.65e+03	0.00e+00	3.31e+02	0.00e+00	1.05e+03	0.00e+00	1.72e+06

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for Teen age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Cow's Milk (food) Pathway for P<sub>i</sub>

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Ho-166m	1.78e+04	5.48e+03	3.97e+03	0.00e+00	8.03e+03	0.00e+00	1.35e+06
W-181	6.27e+04	2.02e+04	2.12e+03	0.00e+00	0.00e+00	0.00e+00	1.72e+06
W-185	2.39e+06	7.88e+05	8.33e+04	0.00e+00	0.00e+00	0.00e+00	6.81e+07
W-187	1.19e+04	9.73e+03	3.41e+03	0.00e+00	0.00e+00	0.00e+00	2.63e+06
Pb-210	1.12e+11	3.36e+10	4.33e+09	0.00e+00	1.06e+11	0.00e+00	1.46e+07
Bi-210	6.57e+05	4.49e+06	3.76e+05	0.00e+00	5.46e+07	0.00e+00	5.13e+07
Po-210	1.37e+09	2.88e+09	3.31e+08	0.00e+00	9.68e+09	0.00e+00	1.81e+08
Ra-223	2.25e+11	3.42e+08	4.50e+10	0.00e+00	9.83e+09	0.00e+00	1.09e+10
Ra-224	2.62e+10	6.25e+07	5.22e+09	0.00e+00	1.79e+09	0.00e+00	4.20e+09
Ra-225	3.50e+11	4.11e+08	6.98e+10	0.00e+00	1.18e+10	0.00e+00	1.22e+10
Ra-226	2.57e+13	6.49e+08	1.91e+13	0.00e+00	1.85e+10	0.00e+00	2.80e+10
Ra-228	1.08e+13	3.49e+08	1.20e+13	0.00e+00	9.98e+09	0.00e+00	4.74e+09
Ac-225	1.14e+05	1.55e+05	7.63e+03	0.00e+00	1.78e+04	0.00e+00	7.89e+06
Ac-227	1.02e+08	1.51e+07	6.07e+06	0.00e+00	4.38e+06	0.00e+00	4.32e+06
Th-227	5.16e+05	9.27e+03	1.49e+04	0.00e+00	5.29e+04	0.00e+00	1.51e+07
Th-228	3.32e+07	5.56e+05	1.12e+06	0.00e+00	3.13e+06	0.00e+00	2.91e+07
Th-229	7.13e+08	2.05e+07	1.18e+07	0.00e+00	9.92e+07	0.00e+00	4.13e+06
Th-230	1.08e+08	6.13e+06	2.99e+06	0.00e+00	2.99e+07	0.00e+00	3.18e+06
Th-232	1.21e+08	5.24e+06	8.13e+04	0.00e+00	2.55e+07	0.00e+00	2.71e+06
Th-234	3.39e+03	1.99e+02	9.86e+01	0.00e+00	1.13e+03	0.00e+00	3.60e+06
Pa-231	2.15e+08	8.08e+06	8.38e+06	0.00e+00	4.54e+07	0.00e+00	3.79e+06
Pa-233	2.30e+02	4.42e+01	3.95e+01	0.00e+00	1.67e+02	0.00e+00	5.05e+05
U-232	2.94e+10	0.00e+00	2.10e+09	0.00e+00	3.18e+09	0.00e+00	3.58e+08
U-233	6.18e+09	0.00e+00	3.76e+08	0.00e+00	1.45e+09	0.00e+00	3.32e+08
U-234	5.93e+09	0.00e+00	3.68e+08	0.00e+00	1.42e+09	0.00e+00	3.25e+08
U-235	5.68e+09	0.00e+00	3.46e+08	0.00e+00	1.33e+09	0.00e+00	4.13e+08
U-236	5.68e+09	0.00e+00	3.54e+08	0.00e+00	1.36e+09	0.00e+00	3.05e+08
U-237	1.04e+05	0.00e+00	2.77e+04	0.00e+00	4.28e+05	0.00e+00	2.76e+07
U-238	5.43e+09	0.00e+00	3.24e+08	0.00e+00	1.25e+09	0.00e+00	2.91e+08
Np-237	6.63e+07	4.76e+06	2.92e+06	0.00e+00	2.16e+07	0.00e+00	4.19e+06

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for Teen age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Cow's Milk (food) Pathway for Pi

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Np-238	6.65e+01	1.78e+00	1.04e+00	0.00e+00	6.10e+00	0.00e+00	1.31e+05
Np-239	7.01e+00	6.62e-01	3.67e-01	0.00e+00	2.08e+00	0.00e+00	1.06e+05
Pu-238	1.34e+07	1.71e+06	3.63e+05	0.00e+00	1.55e+06	0.00e+00	1.54e+06
Pu-239	1.53e+07	1.85e+06	4.01e+05	0.00e+00	1.71e+06	0.00e+00	1.41e+06
Pu-240	1.52e+07	1.85e+06	4.01e+05	0.00e+00	1.71e+06	0.00e+00	1.43e+06
Pu-241	3.48e+05	1.67e+04	7.34e+03	0.00e+00	3.40e+04	0.00e+00	2.94e+04
Pu-242	1.41e+07	1.78e+06	3.87e+05	0.00e+00	1.65e+06	0.00e+00	1.38e+06
Pu-244	1.65e+07	2.03e+06	4.43e+05	0.00e+00	1.88e+06	0.00e+00	2.05e+06
Am-241	3.94e+07	3.72e+07	2.84e+06	0.00e+00	2.13e+07	0.00e+00	3.89e+06
Am-242m	4.02e+07	3.54e+07	2.89e+06	0.00e+00	2.14e+07	0.00e+00	4.93e+06
Am-243	3.97e+07	3.66e+07	2.80e+06	0.00e+00	2.10e+07	0.00e+00	4.60e+06
Cm-242	1.34e+06	1.41e+06	8.88e+04	0.00e+00	4.05e+05	0.00e+00	3.82e+06
Cm-243	3.24e+07	3.00e+07	2.04e+06	0.00e+00	9.51e+06	0.00e+00	4.12e+06
Cm-244	2.51e+07	2.37e+07	1.59e+06	0.00e+00	7.41e+06	0.00e+00	3.98e+06
Cm-245	4.94e+07	4.34e+07	3.04e+06	0.00e+00	1.42e+07	0.00e+00	3.72e+06
Cm-246	4.90e+07	4.34e+07	3.04e+06	0.00e+00	1.42e+07	0.00e+00	3.65e+06
Cm-247	4.77e+07	4.27e+07	2.99e+06	0.00e+00	1.40e+07	0.00e+00	4.80e+06
Cm-248	3.96e+08	3.52e+08	2.47e+07	0.00e+00	1.15e+08	0.00e+00	7.73e+07
Cf-252	1.70e+07	0.00e+00	4.10e+05	0.00e+00	0.00e+00	0.00e+00	1.50e+07

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# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for Child age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Cow's Milk (food) Pathway for Pi

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
H-3	0.00e+00	8.97e+02	8.97e+02	8.97e+02	8.97e+02	8.97e+02	8.97e+02
Be-10	1.11e+07	1.29e+06	2.79e+05	0.00e+00	9.13e+05	0.00e+00	2.26e+07
C-14	1.19e+09	2.39e+08	2.39e+08	2.39e+08	2.39e+08	2.39e+08	2.39e+08
N-13	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
F-18	1.97e-02	0.00e+00	1.96e-03	0.00e+00	0.00e+00	0.00e+00	5.34e-03
Na-22	1.90e+10	1.90e+10	1.90e+10	1.90e+10	1.90e+10	1.90e+10	1.90e+10
Na-24	8.88e+06	8.88e+06	8.88e+06	8.88e+06	8.88e+06	8.88e+06	8.88e+06
P-32	7.78e+10	3.64e+09	3.00e+09	0.00e+00	0.00e+00	0.00e+00	2.15e+09
Ca-41	2.28e+10	0.00e+00	2.49e+09	0.00e+00	0.00e+00	0.00e+00	1.25e+07
Sc-46	6.83e+02	9.36e+02	3.61e+02	0.00e+00	8.29e+02	0.00e+00	1.37e+06
Cr-51	0.00e+00	0.00e+00	1.02e+05	5.65e+04	1.54e+04	1.03e+05	5.40e+06
Mn-54	0.00e+00	2.10e+07	5.59e+06	0.00e+00	5.88e+06	0.00e+00	1.76e+07
Mn-56	0.00e+00	1.28e-02	2.90e-03	0.00e+00	1.55e-02	0.00e+00	1.86e+00
Fe-55	1.12e+08	5.93e+07	1.84e+07	0.00e+00	0.00e+00	3.35e+07	1.10e+07
Fe-59	1.20e+08	1.95e+08	9.69e+07	0.00e+00	0.00e+00	5.64e+07	2.03e+08
Co-57	0.00e+00	3.84e+06	7.77e+06	0.00e+00	0.00e+00	0.00e+00	3.14e+07
Co-58	0.00e+00	1.21e+07	3.71e+07	0.00e+00	0.00e+00	0.00e+00	7.07e+07
Co-60	0.00e+00	4.32e+07	1.27e+08	0.00e+00	0.00e+00	0.00e+00	2.39e+08
Ni-59	2.22e+09	5.90e+08	3.76e+08	0.00e+00	0.00e+00	0.00e+00	3.91e+07
Ni-63	2.96e+10	1.59e+09	1.01e+09	0.00e+00	0.00e+00	0.00e+00	1.07e+08
Ni-65	1.68e+00	1.58e-01	9.24e-02	0.00e+00	0.00e+00	0.00e+00	1.94e+01
Cu-64	0.00e+00	7.49e+04	4.52e+04	0.00e+00	1.81e+05	0.00e+00	3.51e+06
Zn-65	4.13e+09	1.10e+10	6.85e+09	0.00e+00	6.94e+09	0.00e+00	1.93e+09
Zn-69	9.87e-12	1.43e-11	1.32e-12	0.00e+00	8.65e-12	0.00e+00	8.99e-10
Zn-69m	8.06e+05	1.37e+06	1.62e+05	0.00e+00	7.98e+05	0.00e+00	4.47e+07
Se-79	0.00e+00	3.12e+09	6.92e+08	0.00e+00	5.07e+09	0.00e+00	2.05e+08
Br-82	0.00e+00	0.00e+00	1.15e+08	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Br-83	0.00e+00	0.00e+00	4.47e-01	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Br-84	0.00e+00	0.00e+00	7.00e-23	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

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for Child age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Cow's Milk (food) Pathway for Pi

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Rb-86	0.00e+00	8.77e+09	5.39e+09	0.00e+00	0.00e+00	0.00e+00	5.64e+08
Rb-87	0.00e+00	9.75e+09	4.52e+09	0.00e+00	0.00e+00	0.00e+00	1.46e+08
Rb-88	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
Sr-89	6.62e+09	0.00e+00	1.89e+08	0.00e+00	0.00e+00	0.00e+00	2.56e+08
Sr-90	1.68e+11	0.00e+00	3.38e+09	0.00e+00	0.00e+00	0.00e+00	1.50e+09
Sr-91	1.31e+05	0.00e+00	4.94e+03	0.00e+00	0.00e+00	0.00e+00	2.89e+05
Sr-92	2.21e+00	0.00e+00	8.88e-02	0.00e+00	0.00e+00	0.00e+00	4.19e+01
Y-90	3.22e+02	0.00e+00	8.63e+00	0.00e+00	0.00e+00	0.00e+00	9.18e+05
Y-91	3.90e+04	0.00e+00	1.04e+03	0.00e+00	0.00e+00	0.00e+00	5.20e+06
Y-91m	2.80e-19	0.00e+00	1.02e-20	0.00e+00	0.00e+00	0.00e+00	5.49e-16
Y-92	2.56e-04	0.00e+00	7.32e-06	0.00e+00	0.00e+00	0.00e+00	7.39e+00
Y-93	1.02e+00	0.00e+00	2.79e-02	0.00e+00	0.00e+00	0.00e+00	1.51e+04
Zr-93	6.87e+03	2.57e+02	1.83e+02	0.00e+00	9.95e+02	0.00e+00	9.75e+04
Zr-95	3.83e+03	8.42e+02	7.50e+02	0.00e+00	1.21e+03	0.00e+00	8.79e+05
Zr-97	1.92e+00	2.78e-01	1.64e-01	0.00e+00	3.99e-01	0.00e+00	4.21e+04
Nb-93m	2.15e+06	5.37e+05	1.77e+05	0.00e+00	5.80e+05	0.00e+00	8.10e+07
Nb-95	3.18e+05	1.24e+05	8.84e+04	0.00e+00	1.16e+05	0.00e+00	2.29e+08
Nb-97	2.91e-11	5.26e-12	2.46e-12	0.00e+00	5.84e-12	0.00e+00	1.62e-06
Mo-93	0.00e+00	1.49e+09	5.34e+07	0.00e+00	3.92e+08	0.00e+00	7.53e+07
Mo-99	0.00e+00	8.14e+07	2.01e+07	0.00e+00	1.74e+08	0.00e+00	6.73e+07
Tc-101	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Tc-99	1.10e+08	1.23e+08	4.40e+07	0.00e+00	1.44e+09	1.08e+07	1.29e+09
Tc-99m	1.33e+01	2.61e+01	4.32e+02	0.00e+00	3.79e+02	1.32e+01	1.48e+04
Ru-103	4.28e+03	0.00e+00	1.65e+03	0.00e+00	1.08e+04	0.00e+00	1.11e+05
Ru-105	3.85e-03	0.00e+00	1.40e-03	0.00e+00	3.39e-02	0.00e+00	2.51e+00
Ru-106	9.24e+04	0.00e+00	1.15e+04	0.00e+00	1.25e+05	0.00e+00	1.44e+06
Rh-105	1.56e+06	8.40e+05	7.18e+05	0.00e+00	3.35e+06	0.00e+00	5.21e+07
Pd-107	0.00e+00	3.88e+07	3.30e+06	0.00e+00	3.25e+08	0.00e+00	7.71e+07
Pd-109	0.00e+00	1.53e+05	4.59e+04	0.00e+00	8.22e+05	0.00e+00	9.05e+06

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for Child age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Cow's Milk (food) Pathway for Pi

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Ag-110m	2.09e+08	1.41e+08	1.13e+08	0.00e+00	2.63e+08	0.00e+00	1.68e+10
Ag-111	2.94e+07	9.20e+06	6.07e+06	0.00e+00	2.78e+07	0.00e+00	5.63e+09
Cd-113m	0.00e+00	1.00e+07	4.27e+05	0.00e+00	1.03e+07	0.00e+00	2.59e+07
Cd-115m	0.00e+00	4.29e+06	1.83e+05	0.00e+00	3.19e+06	0.00e+00	5.83e+07
Sn-123	2.44e+09	3.03e+07	5.95e+07	3.21e+07	0.00e+00	0.00e+00	1.20e+09
Sn-125	2.57e+08	3.88e+06	1.15e+07	4.03e+06	0.00e+00	0.00e+00	7.98e+08
Sn-126	6.85e+09	8.54e+07	1.95e+08	2.34e+07	0.00e+00	0.00e+00	5.14e+08
Sb-124	1.09e+08	1.41e+06	3.81e+07	2.40e+05	0.00e+00	6.03e+07	6.79e+08
Sb-125	8.70e+07	6.71e+05	1.82e+07	8.06e+04	0.00e+00	4.85e+07	2.08e+08
Sb-126	2.29e+07	3.51e+05	8.23e+06	1.34e+05	0.00e+00	1.09e+07	4.62e+08
Sb-127	1.98e+06	3.07e+04	6.88e+05	2.21e+04	0.00e+00	8.60e+05	1.12e+08
Te-125m	7.38e+07	2.00e+07	9.84e+06	2.07e+07	0.00e+00	0.00e+00	7.12e+07
Te-127	2.99e+03	8.06e+02	6.41e+02	2.07e+03	8.50e+03	0.00e+00	1.17e+05
Te-127m	2.08e+08	5.60e+07	2.47e+07	4.97e+07	5.93e+08	0.00e+00	1.68e+08
Te-129	1.33e-09	3.70e-10	3.15e-10	9.46e-10	3.88e-09	0.00e+00	8.25e-08
Te-129m	2.71e+08	7.58e+07	4.21e+07	8.75e+07	7.97e+08	0.00e+00	3.31e+08
Te-131	1.77e-32	5.40e-33	5.27e-33	1.36e-32	5.36e-32	0.00e+00	9.31e-32
Te-131m	1.60e+06	5.54e+05	5.89e+05	1.14e+06	5.36e+06	0.00e+00	2.25e+07
Te-132	1.03e+07	4.54e+06	5.48e+06	6.61e+06	4.21e+07	0.00e+00	4.57e+07
Te-133m	9.46e-13	3.82e-13	4.74e-13	7.33e-13	3.63e-12	0.00e+00	2.92e-11
Te-134	3.99e-18	1.79e-18	2.39e-18	3.15e-18	1.66e-17	0.00e+00	1.82e-17
I-129	3.43e+09	2.11e+09	1.88e+09	1.38e+12	3.55e+09	0.00e+00	1.06e+08
I-130	1.73e+06	3.50e+06	1.80e+06	3.86e+08	5.23e+06	0.00e+00	1.64e+06
I-131	1.30e+09	1.31e+09	7.45e+08	4.33e+11	2.15e+09	0.00e+00	1.17e+08
I-132	7.01e-01	1.29e+00	5.92e-01	5.97e+01	1.97e+00	0.00e+00	1.52e+00
I-133	1.72e+07	2.13e+07	8.05e+06	3.95e+09	3.55e+07	0.00e+00	8.57e+06
I-134	8.87e-12	1.65e-11	7.57e-12	3.79e-10	2.52e-11	0.00e+00	1.09e-11
I-135	5.43e+04	9.77e+04	4.62e+04	8.66e+06	1.50e+05	0.00e+00	7.45e+04
Cs-134	2.26e+10	3.71e+10	7.84e+09	0.00e+00	1.15e+10	4.13e+09	2.00e+08
Cs-134m	7.42e-01	1.10e+00	7.18e-01	0.00e+00	5.80e-01	9.59e-02	1.39e+00

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# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for Child age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Cow's Milk (food) Pathway for P<sub>i</sub>

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Cs-135	8.19e+09	5.71e+09	5.85e+08	0.00e+00	2.01e+09	6.72e+08	4.27e+07
Cs-136	1.01e+09	2.78e+09	1.80e+09	0.00e+00	1.48e+09	2.21e+08	9.77e+07
Cs-137	3.22e+10	3.09e+10	4.55e+09	0.00e+00	1.01e+10	3.62e+09	1.93e+08
Cs-138	4.27e-23	5.94e-23	3.77e-23	0.00e+00	4.18e-23	4.50e-24	2.74e-23
Cs-139	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Ba-139	2.06e-07	1.10e-10	5.98e-09	0.00e+00	9.62e-11	6.48e-11	1.19e+05
Ba-140	1.17e+08	1.03e+05	6.84e+06	0.00e+00	3.34e+04	6.12e+04	5.93e+07
Ba-141	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	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
La-140	1.94e+01	6.79e+00	2.29e+00	0.00e+00	0.00e+00	0.00e+00	1.89e+05
La-141	1.36e-04	3.17e-05	6.89e-06	0.00e+00	0.00e+00	0.00e+00	7.06e+00
La-142	8.30e-11	2.64e-11	8.28e-12	0.00e+00	0.00e+00	0.00e+00	5.24e-06
Ce-141	2.19e+04	1.09e+04	1.62e+03	0.00e+00	4.78e+03	0.00e+00	1.36e+07
Ce-143	1.88e+02	1.02e+05	1.47e+01	0.00e+00	4.27e+01	0.00e+00	1.49e+06
Ce-144	1.62e+06	5.09e+05	8.66e+04	0.00e+00	2.82e+05	0.00e+00	1.33e+08
Pr-143	7.18e+02	2.16e+02	3.56e+01	0.00e+00	1.17e+02	0.00e+00	7.75e+05
Pr-144	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Nd-147	4.45e+02	3.60e+02	2.79e+01	0.00e+00	1.98e+02	0.00e+00	5.71e+05
Pm-147	1.29e+04	9.19e+02	4.94e+02	0.00e+00	1.62e+03	0.00e+00	3.72e+05
Pm-148	2.66e+02	3.20e+01	2.07e+01	0.00e+00	5.44e+01	0.00e+00	8.54e+05
Pm-148m	3.06e+03	6.09e+02	6.09e+02	0.00e+00	9.03e+02	0.00e+00	1.72e+06
Pm-149	1.94e+01	2.07e+00	1.12e+00	0.00e+00	3.65e+00	0.00e+00	1.41e+05
Pm-151	2.88e+00	3.51e-01	2.28e-01	0.00e+00	5.95e-01	0.00e+00	3.98e+04
Sm-151	1.05e+04	1.57e+03	4.93e+02	0.00e+00	1.62e+03	0.00e+00	2.27e+05
Sm-153	9.02e+00	5.61e+00	5.41e-01	0.00e+00	1.71e+00	0.00e+00	7.46e+04
Eu-152	2.52e+04	4.59e+03	5.45e+03	0.00e+00	1.94e+04	0.00e+00	7.54e+05
Eu-154	9.46e+04	8.51e+03	7.77e+03	0.00e+00	3.74e+04	0.00e+00	1.98e+06
Eu-155	1.94e+04	1.39e+03	1.09e+03	0.00e+00	5.22e+03	0.00e+00	3.49e+06
Eu-156	1.10e+03	5.88e+02	1.22e+02	0.00e+00	3.79e+02	0.00e+00	1.33e+06
Tb-160	5.61e+03	0.00e+00	6.96e+02	0.00e+00	1.67e+03	0.00e+00	1.24e+06

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DOSE FACTORS DUE TO RADIONUCLIDES  
OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for Child age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Cow's Milk (food) Pathway for Pi

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Ho-166m	4.44e+04	9.30e+03	7.86e+03	0.00e+00	1.32e+04	0.00e+00	1.08e+06
W-181	1.54e+05	3.79e+04	5.21e+03	0.00e+00	0.00e+00	0.00e+00	1.38e+06
W-185	5.89e+06	1.47e+06	2.06e+05	0.00e+00	0.00e+00	0.00e+00	5.48e+07
W-187	2.89e+04	1.71e+04	7.69e+03	0.00e+00	0.00e+00	0.00e+00	2.41e+06
Pb-210	2.42e+11	6.21e+10	1.06e+10	0.00e+00	1.87e+11	0.00e+00	1.17e+07
Bi-210	1.62e+06	8.38e+06	9.29e+05	0.00e+00	9.45e+07	0.00e+00	4.25e+07
Po-210	3.37e+09	5.39e+09	8.14e+08	0.00e+00	1.68e+10	0.00e+00	1.45e+08
Ra-223	5.55e+11	6.41e+08	1.11e+11	0.00e+00	1.70e+10	0.00e+00	8.84e+09
Ra-224	6.43e+10	1.17e+08	1.29e+10	0.00e+00	3.09e+09	0.00e+00	3.53e+09
Ra-225	8.62e+11	7.70e+08	1.72e+11	0.00e+00	2.04e+10	0.00e+00	9.89e+09
Ra-226	3.78e+13	1.21e+09	3.11e+13	0.00e+00	3.21e+10	0.00e+00	2.24e+10
Ra-228	2.52e+13	6.53e+08	2.82e+13	0.00e+00	1.73e+10	0.00e+00	3.80e+09
Ac-225	2.81e+05	2.89e+05	1.88e+04	0.00e+00	3.09e+04	0.00e+00	6.43e+06
Ac-227	1.69e+08	2.72e+07	1.05e+07	0.00e+00	5.99e+06	0.00e+00	3.46e+06
Th-227	1.27e+06	1.73e+04	3.67e+04	0.00e+00	9.17e+04	0.00e+00	1.22e+07
Th-228	8.33e+07	1.07e+06	2.82e+06	0.00e+00	5.55e+06	0.00e+00	2.33e+07
Th-229	9.67e+08	2.43e+07	1.61e+07	0.00e+00	1.19e+08	0.00e+00	3.31e+06
Th-230	1.46e+08	7.32e+06	4.08e+06	0.00e+00	3.57e+07	0.00e+00	2.55e+06
Th-232	1.63e+08	6.25e+06	1.24e+05	0.00e+00	3.05e+07	0.00e+00	2.17e+06
Th-234	8.40e+03	3.71e+02	2.43e+02	0.00e+00	1.97e+03	0.00e+00	2.90e+06
Pa-231	2.91e+08	9.63e+06	1.16e+07	0.00e+00	5.27e+07	0.00e+00	3.03e+06
Pa-233	4.68e+02	7.30e+01	8.18e+01	0.00e+00	2.69e+02	0.00e+00	3.73e+05
U-232	7.24e+10	0.00e+00	5.18e+09	0.00e+00	5.51e+09	0.00e+00	2.87e+08
U-233	1.53e+10	0.00e+00	9.26e+08	0.00e+00	2.51e+09	0.00e+00	2.65e+08
U-234	1.47e+10	0.00e+00	9.09e+08	0.00e+00	2.46e+09	0.00e+00	2.60e+08
U-235	1.41e+10	0.00e+00	8.51e+08	0.00e+00	2.31e+09	0.00e+00	3.30e+08
U-236	1.41e+10	0.00e+00	8.72e+08	0.00e+00	2.36e+09	0.00e+00	2.44e+08
U-237	2.57e+05	0.00e+00	6.83e+04	0.00e+00	7.42e+05	0.00e+00	2.27e+07
U-238	1.35e+10	0.00e+00	7.98e+08	0.00e+00	2.16e+09	0.00e+00	2.33e+08
Np-237	9.17e+07	6.05e+06	4.03e+06	0.00e+00	2.49e+07	0.00e+00	3.36e+06

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.



# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for Child age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Cow's Milk (food) Pathway for P<sub>i</sub>

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Np-238	1.64e+02	3.32e+00	2.55e+00	0.00e+00	1.06e+01	0.00e+00	1.14e+05
Np-239	1.73e+01	1.24e+00	8.71e-01	0.00e+00	3.58e+00	0.00e+00	9.17e+04
Pu-238	1.96e+07	2.27e+06	5.20e+05	0.00e+00	1.89e+06	0.00e+00	1.23e+06
Pu-239	2.12e+07	2.27e+06	5.45e+05	0.00e+00	2.01e+06	0.00e+00	1.13e+06
Pu-240	2.11e+07	2.35e+06	5.45e+05	0.00e+00	2.01e+06	0.00e+00	1.15e+06
Pu-241	6.35e+05	2.59e+04	1.32e+04	0.00e+00	4.86e+04	0.00e+00	2.36e+04
Pu-242	1.96e+07	2.27e+06	5.25e+05	0.00e+00	1.93e+06	0.00e+00	1.10e+06
Pu-244	2.29e+07	2.60e+07	6.01e+05	0.00e+00	2.22e+06	0.00e+00	1.65e+06
Am-241	5.54e+07	4.77e+07	4.16e+06	0.00e+00	2.54e+07	0.00e+00	3.11e+06
Am-242m	5.76e+07	4.61e+07	4.28e+06	0.00e+00	2.59e+07	0.00e+00	3.95e+06
Am-243	5.51e+07	4.65e+07	4.04e+06	0.00e+00	2.49e+07	0.00e+00	3.68e+06
Cm-242	3.30e+06	2.63e+06	2.19e+05	0.00e+00	7.02e+05	0.00e+00	3.06e+06
Cm-243	5.26e+07	4.27e+07	3.38e+06	0.00e+00	1.27e+07	0.00e+00	3.30e+06
Cm-244	4.43e+07	3.59e+07	2.84e+06	0.00e+00	1.04e+07	0.00e+00	3.19e+06
Cm-245	6.87e+07	5.51e+07	4.32e+06	0.00e+00	1.69e+07	0.00e+00	2.98e+06
Cm-246	6.79e+07	5.51e+07	4.32e+06	0.00e+00	1.69e+07	0.00e+00	2.92e+06
Cm-247	6.62e+07	5.43e+07	4.24e+06	0.00e+00	1.66e+07	0.00e+00	3.85e+06
Cm-248	5.51e+08	4.48e+08	3.50e+07	0.00e+00	1.37e+08	0.00e+00	6.21e+07
Cf-252	4.25e+07	0.00e+00	1.03e+06	0.00e+00	0.00e+00	0.00e+00	1.20e+07

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for Infant age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Cow's Milk (food) Pathway for Pi

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
H-3	0.00e+00	1.36e+03	1.36e+03	1.36e+03	1.36e+03	1.36e+03	1.36e+03
Be-10	1.41e+07	2.05e+06	4.25e+05	0.00e+00	1.35e+06	0.00e+00	2.29e+07
C-14	2.34e+09	5.00e+08	5.00e+08	5.00e+08	5.00e+08	5.00e+08	5.00e+08
N-13	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
F-18	4.12e-02	0.00e+00	3.51e-03	0.00e+00	0.00e+00	0.00e+00	9.67e-03
Na-22	3.18e+10	3.18e+10	3.18e+10	3.18e+10	3.18e+10	3.18e+10	3.18e+10
Na-24	1.55e+07	1.55e+07	1.55e+07	1.55e+07	1.55e+07	1.55e+07	1.55e+07
P-32	1.60e+11	9.43e+09	6.21e+09	0.00e+00	0.00e+00	0.00e+00	2.17e+09
Ca-41	2.46e+10	0.00e+00	2.69e+09	0.00e+00	0.00e+00	0.00e+00	1.26e+07
Sc-46	1.30e+03	1.88e+03	5.86e+02	0.00e+00	1.23e+03	0.00e+00	1.22e+06
Cr-51	0.00e+00	0.00e+00	1.61e+05	1.05e+05	2.30e+04	2.05e+05	4.70e+06
Mn-54	0.00e+00	3.90e+07	8.84e+06	0.00e+00	8.64e+06	0.00e+00	1.43e+07
Mn-56	0.00e+00	3.14e-02	5.42e-03	0.00e+00	2.70e-02	0.00e+00	2.86e+00
Fe-55	1.35e+08	8.73e+07	2.33e+07	0.00e+00	0.00e+00	4.27e+07	1.11e+07
Fe-59	2.24e+08	3.92e+08	1.54e+08	0.00e+00	0.00e+00	1.16e+08	1.87e+08
Co-57	0.00e+00	8.95e+06	1.46e+07	0.00e+00	0.00e+00	0.00e+00	3.05e+07
Co-58	0.00e+00	2.42e+07	6.05e+07	0.00e+00	0.00e+00	0.00e+00	6.04e+07
Co-60	0.00e+00	8.81e+07	2.08e+08	0.00e+00	0.00e+00	0.00e+00	2.10e+08
Ni-59	2.61e+09	7.99e+08	4.50e+08	0.00e+00	0.00e+00	0.00e+00	3.95e+07
Ni-63	3.49e+10	2.16e+09	1.21e+09	0.00e+00	0.00e+00	0.00e+00	1.07e+08
Ni-65	3.56e+00	4.03e-01	1.83e-01	0.00e+00	0.00e+00	0.00e+00	3.07e+01
Cu-64	0.00e+00	1.86e+05	8.62e+04	0.00e+00	3.15e+05	0.00e+00	3.82e+06
Zn-65	5.55e+09	1.90e+10	8.78e+09	0.00e+00	9.23e+09	0.00e+00	1.61e+10
Zn-69	2.10e-11	3.79e-11	2.82e-12	0.00e+00	1.57e-11	0.00e+00	3.09e-09
Zn-69m	1.70e+06	3.48e+06	3.17e+05	0.00e+00	1.41e+06	0.00e+00	4.82e+07
Se-79	0.00e+00	7.77e+09	1.44e+09	0.00e+00	9.00e+09	0.00e+00	2.07e+08
Br-82	0.00e+00	0.00e+00	1.93e+08	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Br-83	0.00e+00	0.00e+00	9.49e-01	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Br-84	0.00e+00	0.00e+00	1.35e-22	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

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for Infant age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Cow's Milk (food) Pathway for Pi

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-ILLI
Rb-86	0.00e+00	2.23e+10	1.10e+10	0.00e+00	0.00e+00	0.00e+00	5.69e+08
Rb-87	0.00e+00	2.19e+10	8.69e+09	0.00e+00	0.00e+00	0.00e+00	1.48e+08
Rb-88	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
Sr-89	1.26e+10	0.00e+00	3.61e+08	0.00e+00	0.00e+00	0.00e+00	2.59e+08
Sr-90	1.86e+11	0.00e+00	3.77e+09	0.00e+00	0.00e+00	0.00e+00	1.52e+09
Sr-91	2.73e+05	0.00e+00	9.87e+03	0.00e+00	0.00e+00	0.00e+00	3.23e+05
Sr-92	4.71e+00	0.00e+00	1.75e-01	0.00e+00	0.00e+00	0.00e+00	5.08e+01
Y-90	6.82e+02	0.00e+00	1.83e+01	0.00e+00	0.00e+00	0.00e+00	9.41e+05
Y-91	7.33e+04	0.00e+00	1.95e+03	0.00e+00	0.00e+00	0.00e+00	5.25e+06
Y-91m	5.94e-19	0.00e+00	2.03e-20	0.00e+00	0.00e+00	0.00e+00	1.98e-15
Y-92	5.44e-04	0.00e+00	1.53e-05	0.00e+00	0.00e+00	0.00e+00	1.04e+01
Y-93	2.16e+00	0.00e+00	5.90e-02	0.00e+00	0.00e+00	0.00e+00	1.71e+04
Zr-93	7.94e+03	3.78e+02	2.28e+02	0.00e+00	1.11e+03	0.00e+00	9.83e+04
Zr-95	6.80e+03	1.66e+03	1.18e+03	0.00e+00	1.79e+03	0.00e+00	8.26e+05
Zr-97	4.07e+00	6.99e-01	3.19e-01	0.00e+00	7.04e-01	0.00e+00	4.46e+04
Nb-93m	2.52e+06	6.83e+05	2.13e+05	0.00e+00	6.66e+05	0.00e+00	8.16e+07
Nb-95	5.93e+05	2.44e+05	1.41e+05	0.00e+00	1.75e+05	0.00e+00	2.06e+08
Nb-97	6.16e-11	1.31e-11	4.74e-12	0.00e+00	1.03e-11	0.00e+00	4.15e-06
Mo-93	0.00e+00	3.49e+09	1.12e+08	0.00e+00	6.97e+08	0.00e+00	7.47e+07
Mo-99	0.00e+00	2.08e+08	4.06e+07	0.00e+00	3.11e+08	0.00e+00	6.86e+07
Tc-101	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Tc-99	2.22e+08	3.00e+08	9.36e+07	0.00e+00	2.53e+09	2.92e+07	1.30e+09
Tc-99m	2.77e+01	5.70e+01	7.35e+02	0.00e+00	6.14e+02	2.98e+01	1.66e+04
Ru-103	8.67e+03	0.00e+00	2.90e+03	0.00e+00	1.80e+04	0.00e+00	1.05e+05
Ru-105	8.12e-03	0.00e+00	2.74e-03	0.00e+00	5.97e-02	0.00e+00	3.23e+00
Ru-106	1.90e+05	0.00e+00	2.38e+04	0.00e+00	2.25e+05	0.00e+00	1.44e+06
Rh-105	3.32e+06	2.17e+06	1.46e+06	0.00e+00	6.03e+06	0.00e+00	5.39e+07
Pd-107	0.00e+00	9.79e+07	6.95e+06	0.00e+00	5.59e+08	0.00e+00	7.78e+07
Pd-109	0.00e+00	4.05e+05	9.78e+04	0.00e+00	1.49e+06	0.00e+00	9.95e+06

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for Infant age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Cow's Milk (food) Pathway for Pi

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Ag-110m	3.86e+08	2.82e+08	1.86e+08	0.00e+00	4.03e+08	0.00e+00	1.46e+10
Ag-111	6.17e+07	2.40e+07	1.27e+07	0.00e+00	5.01e+07	0.00e+00	5.72e+09
Cd-113m	0.00e+00	1.74e+07	6.42e+05	0.00e+00	1.32e+07	0.00e+00	2.62e+07
Cd-115m	0.00e+00	1.03e+07	3.59e+05	0.00e+00	5.40e+06	0.00e+00	5.89e+07
Sn-123	4.57e+09	7.14e+07	1.19e+08	7.18e+07	0.00e+00	0.00e+00	1.21e+09
Sn-125	5.37e+08	1.00e+07	2.39e+07	9.86e+06	0.00e+00	0.00e+00	8.05e+08
Sn-126	1.14e+10	1.49e+08	3.70e+08	3.93e+07	0.00e+00	0.00e+00	5.18e+08
Sb-124	2.09e+08	3.08e+06	6.49e+07	5.56e+05	0.00e+00	1.31e+08	6.46e+08
Sb-125	1.50e+08	1.45e+06	3.08e+07	1.87e+05	0.00e+00	8.65e+07	1.99e+08
Sb-126	4.20e+07	8.23e+05	1.52e+07	3.22e+05	0.00e+00	2.64e+07	4.35e+08
Sb-127	4.17e+06	7.44e+04	1.29e+06	5.31e+04	0.00e+00	2.15e+06	1.11e+08
Te-125m	1.51e+08	5.04e+07	2.04e+07	5.07e+07	0.00e+00	0.00e+00	7.18e+07
Te-127	6.34e+03	2.13e+03	1.36e+03	5.16e+03	1.55e+04	0.00e+00	1.33e+05
Te-127m	4.21e+08	1.40e+08	5.10e+07	1.22e+08	1.04e+09	0.00e+00	1.70e+08
Te-129	2.81e-09	9.69e-10	6.56e-10	2.36e-09	7.00e-09	0.00e+00	2.25e-07
Te-129m	5.57e+08	1.91e+08	8.58e+07	2.14e+08	1.39e+09	0.00e+00	3.33e+08
Te-131	3.76e-32	1.39e-32	1.05e-32	3.35e-32	9.61e-32	0.00e+00	1.52e-30
Te-131m	3.38e+06	1.36e+06	1.12e+06	2.76e+06	9.36e+06	0.00e+00	2.29e+07
Te-132	2.11e+07	1.05e+07	9.75e+06	1.54e+07	6.54e+07	0.00e+00	3.87e+07
Te-133m	1.98e-12	9.05e-13	8.65e-13	1.74e-12	6.17e-12	0.00e+00	9.76e-11
Te-134	8.25e-18	4.14e-18	4.27e-18	7.39e-18	2.79e-17	0.00e+00	9.46e-17
I-129	7.06e+09	5.23e+09	3.83e+09	3.36e+12	6.19e+09	0.00e+00	1.05e+08
I-130	3.56e+06	7.83e+06	3.14e+06	8.78e+08	8.60e+06	0.00e+00	1.68e+06
I-131	2.72e+09	3.21e+09	1.41e+09	1.05e+12	3.74e+09	0.00e+00	1.14e+08
I-132	1.45e+00	2.95e+00	1.05e+00	1.38e+02	3.29e+00	0.00e+00	2.39e+00
I-133	3.63e+07	5.29e+07	1.55e+07	9.62e+09	6.22e+07	0.00e+00	8.95e+06
I-134	1.84e-11	3.77e-11	1.34e-11	8.78e-10	4.21e-11	0.00e+00	3.89e-11
I-135	1.13e+05	2.25e+05	8.19e+04	2.01e+07	2.50e+05	0.00e+00	8.13e+04
Cs-134	3.65e+10	6.80e+10	6.87e+09	0.00e+00	1.75e+10	7.18e+09	1.85e+08
Cs-134m	1.55e+00	2.58e+00	1.30e+00	0.00e+00	9.94e-01	2.29e-01	2.04e+00

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for Infant age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Cow's Milk (food) Pathway for Pi

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Cs-135	1.31e+10	1.19e+10	6.22e+08	0.00e+00	3.40e+09	1.29e+09	4.31e+07
Cs-136	1.98e+09	5.81e+09	2.17e+09	0.00e+00	2.32e+09	4.74e+08	8.83e+07
Cs-137	5.15e+10	6.02e+10	4.27e+09	0.00e+00	1.62e+10	6.55e+09	1.88e+08
Cs-138	9.01e-23	1.47e-22	7.10e-23	0.00e+00	7.31e-23	1.14e-23	2.34e-22
Cs-139	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Ba-139	4.39e-07	2.91e-10	1.27e-08	0.00e+00	1.75e-10	1.77e-10	2.78e-05
Ba-140	2.41e+08	2.41e+05	1.24e+07	0.00e+00	5.72e+04	1.48e+05	5.92e+07
Ba-141	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	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
La-140	4.06e+01	1.60e+01	4.11e+00	0.00e+00	0.00e+00	0.00e+00	1.88e+05
La-141	2.89e-04	8.39e-05	1.46e-05	0.00e+00	0.00e+00	0.00e+00	9.62e+00
La-142	1.74e-10	6.40e-11	1.53e-11	0.00e+00	0.00e+00	0.00e+00	1.09e-05
Ce-141	4.34e+04	2.64e+04	3.11e+03	0.00e+00	8.15e+03	0.00e+00	1.37e+07
Ce-143	3.97e+02	2.64e+05	3.01e+01	0.00e+00	7.68e+01	0.00e+00	1.54e+06
Ce-144	2.33e+06	9.52e+05	1.30e+05	0.00e+00	3.85e+05	0.00e+00	1.33e+08
Pr-143	1.49e+03	5.55e+02	7.36e+01	0.00e+00	2.06e+02	0.00e+00	7.84e+05
Pr-144	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Nd-147	8.81e+02	9.05e+02	5.55e+01	0.00e+00	3.49e+02	0.00e+00	5.74e+05
Pm-147	1.57e+04	1.32e+03	6.44e+02	0.00e+00	1.98e+03	0.00e+00	3.75e+05
Pm-148	5.57e+02	8.04e+01	4.05e+01	0.00e+00	9.60e+01	0.00e+00	8.58e+05
Pm-148m	4.90e+03	1.24e+03	9.74e+02	0.00e+00	1.43e+03	0.00e+00	1.62e+06
Pm-149	4.13e+01	5.42e+00	2.37e+00	0.00e+00	6.59e+00	0.00e+00	1.46e+05
Pm-151	6.10e+00	8.90e-01	4.50e-01	0.00e+00	1.06e+00	0.00e+00	4.12e+04
Sm-151	1.19e+04	2.74e+03	5.92e+02	0.00e+00	1.86e+03	0.00e+00	2.29e+05
Sm-153	1.91e+01	1.47e+01	1.13e+00	0.00e+00	3.09e+00	0.00e+00	7.71e+04
Eu-152	2.76e+04	7.34e+03	6.19e+03	0.00e+00	2.06e+04	0.00e+00	6.52e+05
Eu-154	1.09e+05	1.51e+04	9.05e+03	0.00e+00	4.09e+04	0.00e+00	1.88e+06
Eu-155	2.18e+04	2.51e+03	1.30e+03	0.00e+00	5.63e+03	0.00e+00	3.36e+06
Eu-156	2.23e+03	1.38e+03	2.19e+02	0.00e+00	6.37e+02	0.00e+00	1.30e+06
Tb-160	8.75e+03	0.00e+00	1.09e+03	0.00e+00	2.49e+03	0.00e+00	1.17e+06

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for Infant age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Cow's Milk (food) Pathway for P<sub>i</sub>

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Ho-166m	5.14e+04	1.11e+04	8.76e+03	0.00e+00	1.47e+04	0.00e+00	1.09e+06
W-181	3.23e+05	9.91e+04	1.11e+04	0.00e+00	0.00e+00	0.00e+00	1.39e+06
W-185	1.23e+07	3.85e+06	4.39e+05	0.00e+00	0.00e+00	0.00e+00	5.51e+07
W-187	6.09e+04	4.23e+04	1.46e+04	0.00e+00	0.00e+00	0.00e+00	2.49e+06
Pb-210	2.69e+11	7.23e+10	1.21e+10	0.00e+00	2.20e+11	0.00e+00	1.18e+07
Bi-210	3.42e+06	2.20e+07	1.96e+06	0.00e+00	1.71e+08	0.00e+00	4.33e+07
Po-210	6.88e+09	1.32e+10	1.64e+09	0.00e+00	2.80e+10	0.00e+00	1.47e+08
Ra-223	1.15e+12	1.68e+09	2.31e+11	0.00e+00	3.06e+10	0.00e+00	8.97e+09
Ra-224	1.36e+11	3.07e+08	2.72e+10	0.00e+00	5.60e+09	0.00e+00	3.60e+09
Ra-225	1.78e+12	2.01e+09	3.54e+11	0.00e+00	3.66e+10	0.00e+00	9.98e+09
Ra-226	4.08e+13	3.13e+09	3.38e+13	0.00e+00	5.73e+10	0.00e+00	2.26e+10
Ra-228	2.82e+13	1.69e+09	3.18e+13	0.00e+00	3.09e+10	0.00e+00	3.83e+09
Ac-225	5.85e+05	7.51e+05	3.92e+04	0.00e+00	5.51e+04	0.00e+00	6.51e+06
Ac-227	1.84e+08	3.15e+07	1.15e+07	0.00e+00	6.40e+06	0.00e+00	3.49e+06
Th-227	2.61e+06	4.37e+04	7.49e+04	0.00e+00	1.61e+05	0.00e+00	1.24e+07
Th-228	9.94e+07	1.36e+06	3.36e+06	0.00e+00	6.36e+06	0.00e+00	2.35e+07
Th-229	1.04e+09	2.60e+07	1.73e+07	0.00e+00	1.25e+08	0.00e+00	3.33e+06
Th-230	1.56e+08	7.82e+06	4.36e+06	0.00e+00	3.75e+07	0.00e+00	2.57e+06
Th-232	1.74e+08	6.70e+06	6.79e+04	0.00e+00	3.20e+07	0.00e+00	2.18e+06
Th-234	1.70e+04	9.26e+02	4.91e+02	0.00e+00	3.41e+03	0.00e+00	2.92e+06
Pa-231	3.11e+08	1.03e+07	1.24e+07	0.00e+00	5.51e+07	0.00e+00	3.06e+06
Pa-233	8.05e+02	1.58e+02	1.41e+02	0.00e+00	4.32e+02	0.00e+00	3.78e+05
U-232	9.95e+10	0.00e+00	8.88e+09	0.00e+00	9.74e+09	0.00e+00	2.89e+08
U-233	2.09e+10	0.00e+00	1.59e+09	0.00e+00	4.44e+09	0.00e+00	2.68e+08
U-234	2.01e+10	0.00e+00	1.56e+09	0.00e+00	4.36e+09	0.00e+00	2.62e+08
U-235	1.92e+10	0.00e+00	1.46e+09	0.00e+00	4.08e+09	0.00e+00	3.33e+08
U-236	1.92e+10	0.00e+00	1.50e+09	0.00e+00	4.15e+09	0.00e+00	2.46e+08
U-237	5.39e+05	0.00e+00	1.44e+05	0.00e+00	1.34e+06	0.00e+00	2.30e+07
U-238	1.84e+10	0.00e+00	1.37e+09	0.00e+00	3.82e+09	0.00e+00	2.35e+08
Np-237	9.87e+07	6.54e+06	4.32e+06	0.00e+00	2.61e+07	0.00e+00	3.39e+06

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

DOSE FACTORS DUE TO RADIONUCLIDES  
OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for Infant age group by nuclide.  
Waterford Steam Electric Station  
Pathway : Cow's Milk (food) Pathway for Pi

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Np-238	3.49e+02	8.78e+00	5.40e+00	0.00e+00	1.92e+01	0.00e+00	1.17e+05
Np-239	3.65e+01	3.26e+00	1.84e+00	0.00e+00	6.51e+00	0.00e+00	9.44e+04
Pu-238	2.11e+07	2.47e+06	5.59e+05	0.00e+00	1.99e+06	0.00e+00	1.24e+06
Pu-239	2.27e+07	2.55e+06	5.82e+05	0.00e+00	2.11e+06	0.00e+00	1.14e+06
Pu-240	2.27e+07	2.55e+06	5.82e+05	0.00e+00	2.11e+06	0.00e+00	1.16e+06
Pu-241	6.97e+05	2.89e+04	1.45e+04	0.00e+00	5.20e+04	0.00e+00	2.38e+04
Pu-242	2.11e+07	2.45e+06	5.61e+05	0.00e+00	2.02e+06	0.00e+00	1.11e+06
Pu-244	2.45e+07	2.81e+06	6.43e+05	0.00e+00	2.32e+06	0.00e+00	1.66e+06
Am-241	5.95e+07	5.17e+07	4.44e+06	0.00e+00	2.67e+07	0.00e+00	3.14e+06
Am-242m	6.21e+07	5.02e+07	4.65e+06	0.00e+00	2.73e+07	0.00e+00	3.98e+06
Am-243	5.92e+07	5.06e+07	4.36e+06	0.00e+00	2.62e+07	0.00e+00	3.71e+06
Cm-242	5.15e+06	4.77e+06	3.42e+05	0.00e+00	9.84e+05	0.00e+00	3.09e+06
Cm-243	5.75e+07	4.72e+07	3.69e+06	0.00e+00	1.34e+07	0.00e+00	3.33e+06
Cm-244	4.84e+07	3.98e+07	3.11e+06	0.00e+00	1.11e+07	0.00e+00	3.22e+06
Cm-245	7.36e+07	5.96e+07	4.65e+06	0.00e+00	1.78e+07	0.00e+00	3.00e+06
Cm-246	7.28e+07	5.96e+07	4.65e+06	0.00e+00	1.77e+07	0.00e+00	2.95e+06
Cm-247	7.12e+07	5.88e+07	4.57e+06	0.00e+00	1.74e+07	0.00e+00	3.88e+06
Cm-248	5.88e+08	4.85e+08	3.77e+07	0.00e+00	1.44e+08	0.00e+00	6.25e+07
Cf-252	4.93e+07	0.00e+00	1.19e+06	0.00e+00	0.00e+00	0.00e+00	1.21e+07

Conversion factors are in units of square meter-mrem/yr per uCi/sec for all nuclides except H-3, which is in units of mrem/yr per uCi/cubic meter.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for all age groups by nuclide.  
Waterford Steam Electric Station  
Pathway : Ground Plane Pathway for P<sub>i</sub>

Nuclide	Organ Dose Conversion Factors	
	T. Body	Skin
H-3	0.00e+00	0.00e+00
Be-10	0.00e+00	0.00e+00
C-14	0.00e+00	0.00e+00
N-13	5.75e+04	6.65e+04
F-18	5.66e+05	6.66e+05
Na-22	3.88e+09	4.36e+09
Na-24	1.71e+07	1.98e+07
P-32	0.00e+00	0.00e+00
Ca-41	9.42e+08	1.11e+09
Sc-46	1.13e+09	1.31e+09
Cr-51	6.65e+06	7.86e+06
Mn-54	1.10e+09	1.29e+09
Mn-56	1.29e+06	1.52e+06
Fe-55	0.00e+00	0.00e+00
Fe-59	3.89e+08	4.57e+08
Co-57	1.63e+08	1.79e+08
Co-58	5.26e+08	6.16e+08
Co-60	4.40e+09	5.18e+09
Ni-59	0.00e+00	0.00e+00
Ni-63	0.00e+00	0.00e+00
Ni-65	4.24e+05	4.93e+05
Cu-64	8.67e+05	9.82e+05
Zn-65	6.88e+08	7.92e+08
Zn-69	0.00e+00	0.00e+00
Zn-69m	1.82e+06	2.13e+06
Se-79	0.00e+00	0.00e+00
Br-82	3.05e+07	3.53e+07
Br-83	6.96e+03	1.01e+04
Br-84	2.89e+05	3.38e+05
Br-85	0.00e+00	0.00e+00

Conversion factors are in units of square meter-mrem/yr per uCi/sec.



# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for all age groups by nuclide.

Waterford Steam Electric Station

Pathway : Ground Plane Pathway for P<sub>i</sub>

Nuclide	Organ Dose Conversion Factors	
	T. Body	Skin
Rb-86	1.28e+07	1.47e+07
Rb-87	0.00e+00	0.00e+00
Rb-88	4.72e+04	5.40e+04
Rb-89	1.76e+05	2.11e+05
Sr-89	3.07e+04	3.56e+04
Sr-90	0.00e+00	0.00e+00
Sr-91	3.07e+06	3.59e+06
Sr-92	1.11e+06	1.23e+06
Y-90	6.42e+03	7.58e+03
Y-91	1.51e+06	1.70e+06
Y-91m	1.43e+05	1.66e+05
Y-92	2.58e+05	3.06e+05
Y-93	2.62e+05	3.58e+05
Zr-93	0.00e+00	0.00e+00
Zr-95	3.43e+08	3.98e+08
Zr-97	4.23e+06	4.92e+06
Nb-93m	2.21e+05	2.69e+07
Nb-95	1.95e+08	2.30e+08
Nb-97	2.57e+05	3.02e+05
Mo-93	6.33e+06	2.57e+08
Mo-99	5.71e+06	6.61e+06
Tc-101	2.91e+04	3.23e+04
Tc-99	0.00e+00	0.00e+00
Tc-99m	2.63e+05	3.01e+05
Ru-103	1.54e+08	1.80e+08
Ru-105	9.09e+05	1.03e+06
Ru-106	3.00e+08	3.60e+08
Rh-105	1.06e+06	1.24e+06
Pd-107	0.00e+00	0.00e+00
Pd-109	2.15e+04	2.46e+04

Conversion factors are in units of square meter-mrem/yr per uCi/sec.

DOSE FACTORS DUE TO RADIONUCLIDES  
OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for all age groups by nuclide.  
Waterford Steam Electric Station  
Pathway : Ground Plane Pathway for Pi

Nuclide	Organ Dose Conversion Factors	
	T. Body	Skin
<hr/>		
Ag-110m	3.13e+09	3.65e+09
Ag-111	1.46e+06	1.71e+06
Cd-113m	6.21e+05	7.01e+05
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Cd-115m	0.00e+00	0.00e+00
Sn-123	0.00e+00	7.82e+09
Sn-125	5.99e+06	6.93e+06
<hr/>		
Sn-126	2.49e+09	2.76e+09
Sb-124	8.42e+08	9.71e+08
Sb-125	7.58e+08	8.55e+08
<hr/>		
Sb-126	1.21e+08	1.36e+08
Sb-127	2.41e+07	2.79e+07
Te-125m	2.19e+06	3.00e+06
<hr/>		
Te-127	4.25e+03	4.68e+03
Te-127m	1.18e+05	1.40e+05
Te-129	3.75e+04	4.43e+04
<hr/>		
Te-129m	2.82e+07	3.30e+07
Te-131	4.17e+04	4.93e+07
Te-131m	1.15e+07	1.35e+07
<hr/>		
Te-132	6.05e+06	7.12e+06
Te-133m	6.30e+05	7.14e+05
Te-134	3.17e+04	3.80e+04
<hr/>		
I-129	1.24e+08	2.07e+08
I-130	7.87e+06	9.56e+06
I-131	2.46e+07	2.98e+07
<hr/>		
I-132	1.78e+06	2.09e+06
I-133	3.50e+06	4.26e+06
I-134	6.38e+05	7.58e+05
<hr/>		
I-135	3.61e+06	4.21e+06
Cs-134	2.82e+09	3.28e+09
Cs-134m	8.18e+04	9.63e+04

Conversion factors are in units of square meter-mrem/yr per uCi/sec.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for all age groups by nuclide.  
Waterford Steam Electric Station  
Pathway : Ground Plane Pathway for P<sub>i</sub>

Nuclide	Organ Dose Conversion Factors	
	T. Body	Skin
Cs-135	0.00e+00	0.00e+00
Cs-136	2.16e+08	2.44e+08
Cs-137	1.15e+09	1.34e+09
Cs-138	5.13e+05	5.86e+05
Cs-139	4.49e+04	5.13e+04
Ba-139	1.51e+05	1.70e+05
Ba-140	2.93e+07	3.35e+07
Ba-141	5.96e+04	6.79e+04
Ba-142	6.41e+04	7.30e+04
La-140	2.74e+07	3.11e+07
La-141	4.47e+04	5.01e+04
La-142	1.09e+06	1.30e+06
Ce-141	1.95e+07	2.20e+07
Ce-143	3.30e+06	3.75e+06
Ce-144	5.85e+07	6.77e+07
Pr-143	0.00e+00	0.00e+00
Pr-144	2.62e+03	3.01e+03
Nd-147	1.20e+07	1.44e+07
Pm-147	0.00e+00	0.00e+00
Pm-148	2.70e+07	3.11e+07
Pm-148m	6.34e+08	3.67e+09
Pm-149	6.03e+04	7.00e+04
Pm-151	2.83e+06	2.96e+06
Sm-151	1.32e+07	5.78e+07
Sm-153	5.75e+05	6.39e+05
Eu-152	1.98e+09	2.29e+09
Eu-154	2.15e+09	2.48e+09
Eu-155	8.74e+07	9.93e+07
Eu-156	1.26e+08	1.44e+08
Tb-160	6.57e+08	7.64e+08

Conversion factors are in units of square meter-mrem/yr per uCi/sec.

# DOSE FACTORS DUE TO RADIONUCLIDES OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for all age groups by nuclide.  
Waterford Steam Electric Station  
Pathway : Ground Plane Pathway for P<sub>i</sub>

Nuclide	Organ Dose Conversion Factors	
	T. Body	Skin
Ho-166m	2.46e+09	2.76e+09
W-181	2.43e+05	3.24e+05
W-185	0.00e+00	0.00e+00
W-187	3.36e+06	3.90e+06
Pb-210	3.53e+06	4.62e+06
Bi-210	0.00e+00	0.00e+00
Po-210	6.84e+03	7.85e+03
Ra-223	1.87e+07	2.24e+07
Ra-224	3.56e+07	4.00e+07
Ra-225	1.36e+06	1.94e+06
Ra-226	1.77e+09	2.04e+09
Ra-228	3.12e+09	3.64e+09
Ac-225	1.75e+07	1.97e+07
Ac-227	5.44e+08	6.53e+08
Th-227	1.03e+07	1.27e+07
Th-228	2.06e+09	2.32e+09
Th-229	6.08e+08	7.46e+08
Th-230	1.80e+09	2.07e+09
Th-232	8.29e+08	1.11e+09
Th-234	2.89e+06	3.42e+06
Pa-231	6.08e+08	7.46e+08
Pa-233	3.89e+07	4.49e+07
U-232	7.12e+05	7.40e+06
U-233	6.35e+08	7.74e+08
U-234	1.75e+05	4.39e+07
U-235	8.84e+08	1.11e+09
U-236	5.80e+03	4.97e+06
U-237	7.37e+06	9.58e+06
U-238	3.04e+07	4.14e+07
Np-237	3.87e+08	4.42e+08

Conversion factors are in units of square meter-mrem/yr per uCi/sec.

DOSE FACTORS DUE TO RADIONUCLIDES  
OTHER THAN NOBLE GASES; P<sub>i</sub>

Pi factors for all age groups by nuclide.  
Waterford Steam Electric Station  
Pathway : Ground Plane Pathway for P<sub>i</sub>

Nuclide	Organ Dose Conversion Factors	
	T. Body	Skin
Np-238	6.48e+06	7.41e+06
Np-239	2.44e+06	2.83e+06
Pu-238	3.58e+05	4.95e+06
Pu-239	2.18e+05	2.13e+06
Pu-240	3.59e+05	4.97e+06
Pu-241	1.24e+06	1.84e+06
Pu-242	3.04e+05	4.42e+06
Pu-244	2.47e+08	2.66e+08
Am-241	4.60e+07	6.64e+07
Am-242m	7.17e+06	4.96e+07
Am-243	3.59e+08	4.14e+08
Cm-242	7.72e+05	3.23e+06
Cm-243	6.28e+08	7.91e+08
Cm-244	7.86e+05	4.88e+06
Cm-245	2.62e+08	3.31e+08
Cm-246	2.76e+05	4.14e+06
Cm-247	6.08e+08	7.18e+08
Cm-248	1.88e+09	1.44e+09
Cf-252	1.59e+10	1.73e+10

Conversion factors are in units of square meter-mrem/yr per uCi/sec.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (GROUND PLANE)

Ground Plane Dose Conversion factors for all age groups by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors	
	T. Body	Skin
H-3	0.00e+00	0.00e+00
Be-10	0.00e+00	0.00e+00
C-14	0.00e+00	0.00e+00
N-13	7.60e-09	8.80e-09
F-18	6.80e-09	8.00e-09
Na-22	1.60e-08	1.80e-08
Na-24	2.50e-08	2.90e-08
P-32	0.00e+00	0.00e+00
Ca-41	3.41e-09	4.01e-09
Sc-46	1.30e-08	1.50e-08
Cr-51	2.20e-10	2.60e-10
Mn-54	5.80e-09	6.80e-09
Mn-56	1.10e-08	1.30e-08
Fe-55	0.00e+00	0.00e+00
Fe-59	8.00e-09	9.40e-09
Co-57	9.10e-10	1.00e-09
Co-58	7.00e-09	8.20e-09
Co-60	1.70e-08	2.00e-08
Ni-59	0.00e+00	0.00e+00
Ni-63	0.00e+00	0.00e+00
Ni-65	3.70e-09	4.30e-09
Cu-64	1.50e-09	1.70e-09
Zn-65	4.00e-09	4.60e-09
Zn-69	0.00e+00	0.00e+00
Zn-69m	2.90e-09	3.40e-09
Se-79	0.00e+00	0.00e+00
Br-82	1.90e-08	2.20e-08
Br-83	6.40e-11	9.30e-11
Br-84	1.20e-08	1.40e-08
Br-85	0.00e+00	0.00e+00

Conversion factors are in units of mrem/hr per pCi/square meter.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (GROUND PLANE)

Ground Plane Dose Conversion factors for all age groups by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors	
	T. Body	Skin
Rb-86	6.30e-10	7.20e-10
Rb-87	0.00e+00	0.00e+00
Rb-88	3.50e-09	4.00e-09
Rb-89	1.50e-08	1.80e-08
Sr-89	5.60e-13	6.50e-13
Sr-90	0.00e+00	0.00e+00
Sr-91	7.10e-09	8.30e-09
Sr-92	9.00e-09	1.00e-08
Y-90	2.20e-12	2.60e-12
Y-91	2.40e-11	2.70e-11
Y-91m	3.80e-09	4.40e-09
Y-92	1.60e-09	1.90e-09
Y-93	5.70e-10	7.80e-10
Zr-93	0.00e+00	0.00e+00
Zr-95	5.00e-09	5.80e-09
Zr-97	5.50e-09	6.40e-09
Nb-93m	8.20e-13	1.00e-10
Nb-95	5.10e-09	6.00e-09
Nb-97	4.60e-09	5.40e-09
Mo-93	2.29e-11	9.32e-10
Mo-99	1.90e-09	2.20e-09
Tc-101	2.70e-09	3.00e-09
Tc-99	0.00e+00	0.00e+00
Tc-99m	9.60e-10	1.10e-09
Ru-103	3.60e-09	4.20e-09
Ru-105	4.50e-09	5.10e-09
Ru-106	1.50e-09	1.80e-09
Rh-105	6.60e-10	7.70e-10
Pd-107	0.00e+00	0.00e+00
Pd-109	3.50e-11	4.00e-11

Conversion factors are in units of mrem/hr per pCi/square meter.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (GROUND PLANE)

Ground Plane Dose Conversion factors for all age groups by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors	
	T. Body	Skin
Ag-110m	1.80e-08	2.10e-08
Ag-111	1.80e-10	2.10e-10
Cd-113m	2.30e-12	2.60e-12
Cd-115m	0.00e+00	0.00e+00
Sn-123	0.00e+00	6.46e-08
Sn-125	5.70e-10	6.60e-10
Sn-126	9.00e-09	1.00e-08
Sb-124	1.30e-08	1.50e-08
Sb-125	3.10e-09	3.50e-09
Sb-126	8.90e-09	1.00e-08
Sb-127	5.70e-09	6.60e-09
Te-125m	3.50e-11	4.80e-11
Te-127	1.00e-11	1.10e-11
Te-127m	1.10e-12	1.30e-12
Te-129	7.10e-10	8.40e-10
Te-129m	7.70e-10	9.00e-10
Te-131	2.20e-09	2.60e-06
Te-131m	8.40e-09	9.90e-09
Te-132	1.70e-09	2.00e-09
Te-133m	1.50e-08	1.70e-08
Te-134	1.00e-09	1.20e-09
I-129	4.50e-10	7.50e-10
I-130	1.40e-08	1.70e-08
I-131	2.80e-09	3.40e-09
I-132	1.70e-08	2.00e-08
I-133	3.70e-09	4.50e-09
I-134	1.60e-08	1.90e-08
I-135	1.20e-08	1.40e-08
Cs-134	1.20e-08	1.40e-08
Cs-134m	6.20e-10	7.30e-10

Conversion factors are in units of mrem/hr per pCi/square meter.



# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (GROUND PLANE)

Ground Plane Dose Conversion factors for all age groups by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors	
	T. Body	Skin
Cs-135	0.00e+00	0.00e+00
Cs-136	1.50e-08	1.70e-08
Cs-137	4.20e-09	4.90e-09
Cs-138	2.10e-08	2.40e-08
Cs-139	6.30e-09	7.20e-09
Ba-139	2.40e-09	2.70e-09
Ba-140	2.10e-09	2.40e-09
Ba-141	4.30e-09	4.90e-09
Ba-142	7.90e-09	9.00e-09
La-140	1.50e-08	1.70e-08
La-141	2.50e-10	2.80e-10
La-142	1.50e-08	1.80e-08
Ce-141	5.50e-10	6.20e-10
Ce-143	2.20e-09	2.50e-09
Ce-144	3.20e-10	3.70e-10
Pr-143	0.00e+00	0.00e+00
Pr-144	2.00e-10	2.30e-10
Nd-147	1.00e-09	1.20e-09
Pm-147	0.00e+00	0.00e+00
Pm-148	4.60e-09	5.30e-09
Pm-148m	1.41e-08	8.16e-08
Pm-149	2.50e-11	2.90e-11
Pm-151	2.20e-09	2.30e-09
Sm-151	4.80e-11	2.10e-10
Sm-153	2.70e-10	3.00e-10
Eu-152	7.37e-09	8.53e-09
Eu-154	7.80e-09	9.00e-09
Eu-155	3.81e-10	4.33e-10
Eu-156	7.60e-09	8.70e-09
Tb-160	8.60e-09	1.00e-08

Conversion factors are in units of mrem/hr per pCi/square meter.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (GROUND PLANE)

Ground Plane Dose Conversion factors for all age groups by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors	
	T. Body	Skin
Ho-166m	8.90e-09	1.00e-08
W-181	2.10e-12	2.80e-12
W-185	0.00e+00	0.00e+00
W-187	3.10e-09	3.60e-09
Pb-210	1.30e-11	1.70e-11
Bi-210	0.00e+00	0.00e+00
Po-210	5.40e-14	6.20e-14
Ra-223	1.50e-09	1.80e-09
Ra-224	8.90e-09	1.00e-08
Ra-225	8.40e-11	1.20e-10
Ra-226	6.40e-09	7.40e-09
Ra-228	1.20e-08	1.40e-08
Ac-225	1.60e-09	1.80e-09
Ac-227	2.00e-09	2.40e-09
Th-227	5.10e-10	6.30e-10
Th-228	8.90e-09	1.00e-08
Th-229	2.20e-09	2.70e-09
Th-230	6.50e-09	7.50e-09
Th-232	3.00e-09	4.00e-09
Th-234	1.10e-10	1.30e-10
Pa-231	2.20e-09	2.70e-09
Pa-233	1.30e-09	1.50e-09
U-232	2.59e-12	2.69e-11
U-233	2.30e-09	2.80e-09
U-234	6.32e-13	1.59e-10
U-235	3.20e-09	4.00e-09
U-236	2.10e-14	1.80e-11
U-237	1.00e-09	1.30e-09
U-238	1.10e-10	1.50e-10
Np-237	1.40e-09	1.60e-09

Conversion factors are in units of mrem/hr per pCi/square meter.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (GROUND PLANE)

Ground Plane Dose Conversion factors for all age groups by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors	
	T. Body	Skin
Np-238	2.80e-09	3.20e-09
Np-239	9.50e-10	1.10e-09
Pu-238	1.30e-12	1.80e-11
Pu-239	7.90e-13	7.70e-12
Pu-240	1.30e-12	1.80e-11
Pu-241	4.60e-12	6.80e-12
Pu-242	1.10e-12	1.60e-11
Pu-244	8.95e-10	9.62e-10
Am-241	1.80e-10	2.60e-10
Am-242m	2.60e-11	1.80e-10
Am-243	1.30e-09	1.50e-09
Cm-242	5.50e-12	2.30e-11
Cm-243	2.30e-09	2.90e-09
Cm-244	2.90e-12	1.80e-11
Cm-245	9.50e-10	1.20e-09
Cm-246	1.00e-12	1.50e-11
Cm-247	2.20e-09	2.60e-09
Cm-248	6.81e-09	5.23e-09
Cf-252	6.60e-08	7.20e-08

Conversion factors are in units of mrem/hr per pCi/square meter.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Inhalation Dose Conversion factors for Adult age group by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
H-3	0.00e+00	8.98e-08	8.98e-08	8.98e-08	8.98e-08	8.98e-08	8.98e-08
Be-10	1.98e-04	3.06e-05	4.96e-06	0.00e+00	0.00e+00	2.22e-04	1.67e-05
C-14	2.27e-06	4.26e-07	4.26e-07	4.26e-07	4.26e-07	4.26e-07	4.26e-07
N-13	6.27e-09	6.27e-09	6.27e-09	6.27e-09	6.27e-09	6.27e-09	6.27e-09
F-18	4.71e-07	0.00e+00	5.19e-08	0.00e+00	0.00e+00	0.00e+00	9.24e-09
Na-22	1.30e-05	1.30e-05	1.30e-05	1.30e-05	1.30e-05	1.30e-05	1.30e-05
Na-24	1.28e-06	1.28e-06	1.28e-06	1.28e-06	1.28e-06	1.28e-06	1.28e-06
P-32	1.65e-04	9.64e-06	6.26e-06	0.00e+00	0.00e+00	0.00e+00	1.08e-05
Ca-41	3.83e-05	0.00e+00	4.13e-06	0.00e+00	0.00e+00	3.83e-06	2.86e-07
Sc-46	5.51e-05	1.07e-04	3.11e-05	0.00e+00	9.99e-05	0.00e+00	3.23e-05
Cr-51	0.00e+00	0.00e+00	1.25e-08	7.44e-09	2.85e-09	1.80e-06	4.15e-07
Mn-54	0.00e+00	4.95e-06	7.87e-07	0.00e+00	1.23e-06	1.75e-04	9.67e-06
Mn-56	0.00e+00	1.55e-10	2.29e-11	0.00e+00	1.63e-10	1.18e-06	2.53e-06
Fe-55	3.07e-06	2.12e-06	4.93e-07	0.00e+00	0.00e+00	9.01e-06	7.54e-07
Fe-59	1.47e-06	3.47e-06	1.32e-06	0.00e+00	0.00e+00	1.27e-04	2.35e-05
Co-57	0.00e+00	8.65e-08	8.39e-08	0.00e+00	0.00e+00	4.62e-05	3.93e-06
Co-58	0.00e+00	1.98e-07	2.59e-07	0.00e+00	0.00e+00	1.16e-04	1.33e-05
Co-60	0.00e+00	1.44e-06	1.85e-06	0.00e+00	0.00e+00	7.46e-04	3.56e-05
Ni-59	4.06e-06	1.46e-06	6.77e-07	0.00e+00	0.00e+00	8.20e-06	6.11e-07
Ni-63	5.40e-05	3.93e-06	1.81e-06	0.00e+00	0.00e+00	2.23e-05	1.67e-06
Ni-65	1.92e-10	2.62e-11	1.14e-11	0.00e+00	0.00e+00	7.00e-07	1.54e-06
Cu-64	0.00e+00	1.83e-10	7.69e-11	0.00e+00	5.78e-10	8.48e-07	6.12e-06
Zn-65	4.05e-06	1.29e-05	5.82e-06	0.00e+00	8.62e-06	1.08e-04	6.68e-06
Zn-69	4.23e-12	8.14e-12	5.65e-13	0.00e+00	5.27e-12	1.15e-07	2.04e-09
Zn-69m	1.02e-09	2.45e-09	2.24e-10	0.00e+00	1.48e-09	2.38e-06	1.71e-05
Se-79	0.00e+00	3.83e-07	6.09e-08	0.00e+00	5.69e-07	4.47e-05	3.33e-06
Br-82	0.00e+00	0.00e+00	1.69e-06	0.00e+00	0.00e+00	0.00e+00	1.30e-06
Br-83	0.00e+00	0.00e+00	3.01e-08	0.00e+00	0.00e+00	0.00e+00	2.90e-08
Br-84	0.00e+00	0.00e+00	3.91e-08	0.00e+00	0.00e+00	0.00e+00	2.05e-13
Br-85	0.00e+00	0.00e+00	1.60e-09	0.00e+00	0.00e+00	0.00e+00	0.00e+00

Conversion factors are in units of mrem per pCi inhaled.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Inhalation Dose Conversion factors for Adult age group by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Rb-86	0.00e+00	1.69e-05	7.37e-06	0.00e+00	0.00e+00	0.00e+00	2.08e-06
Rb-87	0.00e+00	9.86e-06	3.21e-06	0.00e+00	0.00e+00	0.00e+00	2.88e-07
Rb-88	0.00e+00	4.84e-08	2.41e-08	0.00e+00	0.00e+00	0.00e+00	4.18e-19
Rb-89	0.00e+00	3.20e-08	2.12e-08	0.00e+00	0.00e+00	0.00e+00	1.16e-21
Sr-89	3.80e-05	0.00e+00	1.09e-06	0.00e+00	0.00e+00	1.75e-04	4.37e-05
Sr-90	3.59e-03	0.00e+00	7.21e-05	0.00e+00	0.00e+00	1.20e-03	9.02e-05
Sr-91	7.74e-09	0.00e+00	3.13e-10	0.00e+00	0.00e+00	4.56e-06	2.39e-05
Sr-92	8.43e-10	0.00e+00	3.64e-11	0.00e+00	0.00e+00	2.06e-06	5.38e-06
Y-90	2.61e-07	0.00e+00	7.01e-09	0.00e+00	0.00e+00	2.12e-05	6.32e-05
Y-91	5.78e-05	0.00e+00	1.55e-06	0.00e+00	0.00e+00	2.13e-04	4.81e-05
Y-91m	3.26e-11	0.00e+00	1.27e-12	0.00e+00	0.00e+00	2.40e-07	1.66e-10
Y-92	1.29e-09	0.00e+00	3.77e-11	0.00e+00	0.00e+00	1.96e-06	9.19e-06
Y-93	1.18e-08	0.00e+00	3.26e-10	0.00e+00	0.00e+00	6.06e-06	5.27e-05
Zr-93	5.22e-05	2.92e-06	1.37e-06	0.00e+00	1.11e-05	2.13e-05	1.51e-06
Zr-95	1.34e-05	4.30e-06	2.91e-06	0.00e+00	6.77e-06	2.21e-04	1.88e-05
Zr-97	1.21e-08	2.45e-09	1.13e-09	0.00e+00	3.71e-09	9.84e-06	6.54e-05
Nb-93m	3.10e-05	1.01e-05	2.49e-06	0.00e+00	1.16e-05	3.11e-05	2.38e-06
Nb-95	1.76e-06	9.77e-07	5.26e-07	0.00e+00	9.67e-07	6.31e-05	1.30e-05
Nb-97	2.78e-11	7.03e-12	2.56e-12	0.00e+00	8.18e-12	3.00e-07	3.02e-08
Mo-93	0.00e+00	1.17e-06	3.17e-08	0.00e+00	3.55e-07	5.11e-05	3.79e-06
Mo-99	0.00e+00	1.51e-08	2.87e-09	0.00e+00	3.64e-08	1.14e-05	3.10e-05
Tc-101	5.22e-15	7.52e-15	7.38e-14	0.00e+00	1.35e-13	4.99e-08	1.36e-21
Tc-99	3.13e-08	4.64e-08	1.25e-08	0.00e+00	5.85e-07	1.01e-04	7.54e-06
Tc-99m	1.29e-13	3.64e-13	4.63e-12	0.00e+00	5.52e-12	9.55e-08	5.20e-07
Ru-103	1.91e-07	0.00e+00	8.23e-08	0.00e+00	7.29e-07	6.31e-05	1.38e-05
Ru-105	9.88e-11	0.00e+00	3.89e-11	0.00e+00	1.27e-10	1.37e-06	6.02e-06
Ru-106	8.64e-06	0.00e+00	1.09e-06	0.00e+00	1.67e-05	1.17e-03	1.14e-04
Rh-105	9.24e-10	6.73e-10	4.43e-10	0.00e+00	2.86e-09	2.41e-06	1.09e-05
Pd-107	0.00e+00	8.27e-08	5.87e-09	0.00e+00	6.57e-07	9.47e-06	7.06e-07
Pd-109	0.00e+00	4.63e-10	1.16e-10	0.00e+00	2.35e-09	1.85e-06	1.52e-05

Conversion factors are in units of mrem per pCi inhaled.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Inhalation Dose Conversion factors for Adult age group by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Ag-110m	1.35e-06	1.25e-06	7.43e-07	0.00e+00	2.46e-06	5.79e-04	3.78e-05
Ag-111	4.25e-08	1.78e-08	8.87e-09	0.00e+00	5.74e-08	2.33e-05	2.79e-05
Cd-113m	0.00e+00	1.54e-04	4.97e-06	0.00e+00	1.71e-04	2.08e-04	1.59e-05
Cd-115m	0.00e+00	2.46e-05	7.95e-07	0.00e+00	1.98e-05	1.76e-04	4.80e-05
Sn-123	3.02e-05	6.67e-07	9.82e-07	5.67e-07	0.00e+00	2.88e-04	3.92e-05
Sn-125	1.16e-06	3.12e-08	7.03e-08	2.59e-08	0.00e+00	7.37e-05	6.81e-05
Sn-126	1.58e-04	4.18e-06	6.00e-06	1.23e-06	0.00e+00	1.17e-03	1.59e-05
Sb-124	3.90e-06	7.36e-08	1.55e-06	9.44e-09	0.00e+00	3.10e-04	5.08e-05
Sb-125	6.67e-06	7.44e-08	1.58e-06	6.75e-09	0.00e+00	2.18e-04	1.26e-05
Sb-126	4.50e-07	9.13e-09	1.62e-07	2.75e-09	0.00e+00	9.57e-05	6.01e-05
Sb-127	3.30e-08	7.22e-10	1.27e-08	3.97e-10	0.00e+00	2.05e-05	3.77e-05
Te-125m	4.27e-07	1.98e-07	5.84e-08	1.31e-07	1.55e-06	3.92e-05	8.83e-06
Te-127	1.75e-10	8.03e-11	3.87e-11	1.32e-10	6.37e-10	8.14e-07	7.17e-06
Te-127m	1.58e-06	7.21e-07	1.96e-07	4.11e-07	5.72e-06	1.20e-04	1.87e-05
Te-129	6.22e-12	2.99e-12	1.55e-12	4.87e-12	2.34e-11	2.42e-07	1.96e-08
Te-129m	1.22e-06	5.84e-07	1.98e-07	4.30e-07	4.57e-06	1.45e-04	4.79e-05
Te-131	1.39e-12	7.44e-13	4.49e-13	1.17e-12	5.46e-12	1.74e-07	2.30e-09
Te-131m	8.74e-09	5.45e-09	3.63e-09	6.88e-09	3.86e-08	1.82e-05	6.95e-05
Te-132	3.25e-08	2.69e-08	2.02e-08	2.37e-08	1.82e-07	3.60e-05	6.37e-05
Te-133m	7.24e-12	5.40e-12	4.17e-12	6.27e-12	3.74e-11	5.51e-07	7.65e-09
Te-134	3.84e-12	3.22e-12	1.57e-12	3.44e-12	2.18e-11	4.34e-07	2.97e-11
I-129	2.48e-06	2.11e-06	6.91e-06	5.54e-03	4.53e-06	0.00e+00	2.22e-07
I-130	5.72e-07	1.68e-06	6.60e-07	1.42e-04	2.61e-06	0.00e+00	9.61e-07
I-131	3.15e-06	4.47e-06	2.56e-06	1.49e-03	7.66e-06	0.00e+00	7.85e-07
I-132	1.45e-07	4.07e-07	1.45e-07	1.43e-05	6.48e-07	0.00e+00	5.08e-08
I-133	1.08e-06	1.85e-06	5.65e-07	2.69e-04	3.23e-06	0.00e+00	1.11e-06
I-134	8.05e-08	2.16e-07	7.69e-08	3.73e-06	3.44e-07	0.00e+00	1.26e-10
I-135	3.35e-07	8.73e-07	3.21e-07	5.60e-05	1.39e-06	0.00e+00	6.56e-07
Cs-134	4.66e-05	1.06e-04	9.10e-05	0.00e+00	3.59e-05	1.22e-05	1.30e-06
Cs-134m	1.59e-08	3.20e-08	1.72e-08	0.00e+00	1.83e-08	2.93e-09	7.92e-09

Conversion factors are in units of mrem per pCi inhaled.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Inhalation Dose Conversion factors for Adult age group by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Cs-135	1.46e-05	1.29e-05	5.99e-06	0.00e+00	5.11e-06	1.57e-06	2.11e-07
Cs-136	4.88e-06	1.83e-05	1.38e-05	0.00e+00	1.07e-05	1.50e-06	1.46e-06
Cs-137	5.98e-05	7.76e-05	5.35e-05	0.00e+00	2.78e-05	9.40e-06	1.05e-06
Cs-138	4.14e-08	7.76e-08	4.05e-08	0.00e+00	6.00e-08	6.07e-09	2.33e-13
Cs-139	2.56e-08	3.63e-08	1.39e-08	0.00e+00	3.05e-08	2.84e-09	5.49e-31
Ba-139	1.17e-10	8.32e-14	3.42e-12	0.00e+00	7.78e-14	4.70e-07	1.12e-07
Ba-140	4.88e-06	6.13e-09	3.21e-07	0.00e+00	2.09e-09	1.59e-04	2.73e-05
Ba-141	1.25e-11	9.41e-15	4.20e-13	0.00e+00	8.75e-15	2.42e-07	1.45e-17
Ba-142	3.29e-12	3.38e-15	2.07e-13	0.00e+00	2.86e-15	1.49e-07	1.96e-26
La-140	4.30e-08	2.17e-08	5.73e-09	0.00e+00	0.00e+00	1.70e-05	5.73e-05
La-141	5.34e-10	1.66e-10	2.71e-11	0.00e+00	0.00e+00	1.35e-06	7.31e-06
La-142	8.54e-11	3.88e-11	9.65e-12	0.00e+00	0.00e+00	7.91e-07	2.64e-07
Ce-141	2.49e-06	1.69e-06	1.91e-07	0.00e+00	7.83e-07	4.52e-05	1.50e-05
Ce-143	2.33e-08	1.72e-08	1.91e-09	0.00e+00	7.60e-09	9.97e-06	2.83e-05
Ce-144	4.29e-04	1.79e-04	2.30e-05	0.00e+00	1.06e-04	9.72e-04	1.02e-04
Pr-143	1.17e-06	4.69e-07	5.80e-08	0.00e+00	2.70e-07	3.51e-05	2.50e-05
Pr-144	3.76e-12	1.56e-12	1.91e-13	0.00e+00	8.81e-13	1.27e-07	2.69e-18
Nd-147	6.59e-07	7.62e-07	4.56e-08	0.00e+00	4.45e-07	2.76e-05	2.16e-05
Pm-147	8.37e-05	7.87e-06	3.19e-06	0.00e+00	1.49e-05	6.60e-05	5.54e-06
Pm-148	3.84e-07	6.37e-08	3.20e-08	0.00e+00	1.20e-07	3.91e-05	5.80e-05
Pm-148m	9.82e-06	2.54e-06	1.94e-06	0.00e+00	3.85e-06	2.14e-04	4.18e-05
Pm-149	3.44e-08	4.87e-09	1.99e-09	0.00e+00	9.19e-09	7.21e-06	2.50e-05
Pm-151	8.50e-09	1.42e-09	7.21e-10	0.00e+00	2.55e-09	3.94e-06	2.00e-05
Sm-151	8.59e-05	1.48e-05	3.55e-06	0.00e+00	1.66e-05	4.45e-05	3.25e-06
Sm-153	1.70e-08	1.42e-08	1.04e-09	0.00e+00	4.59e-09	4.14e-06	1.58e-05
Eu-152	2.38e-04	5.41e-05	4.76e-05	0.00e+00	3.35e-04	3.43e-04	1.59e-05
Eu-154	7.40e-04	9.10e-05	6.48e-05	0.00e+00	4.36e-04	5.84e-04	3.40e-05
Eu-155	1.01e-04	1.43e-05	9.21e-06	0.00e+00	6.59e-05	9.46e-05	5.95e-06
Eu-156	1.93e-06	1.48e-06	2.40e-07	0.00e+00	9.95e-07	8.56e-05	4.50e-05
Tb-160	2.21e-05	0.00e+00	2.75e-06	0.00e+00	9.10e-06	1.92e-04	2.68e-05

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# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Inhalation Dose Conversion factors for Adult age group by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Ho-166m	3.37e-04	1.05e-04	8.00e-05	0.00e+00	1.57e-04	3.94e-04	1.59e-05
W-181	6.23e-09	2.03e-09	2.17e-10	0.00e+00	0.00e+00	1.71e-06	2.53e-07
W-185	1.95e-07	6.47e-08	6.81e-09	0.00e+00	0.00e+00	5.57e-05	1.07e-05
W-187	1.06e-09	8.85e-10	3.10e-10	0.00e+00	0.00e+00	3.63e-06	1.94e-05
Pb-210	2.64e-02	6.73e-03	8.37e-04	0.00e+00	2.12e-02	2.62e-02	1.51e-06
Bi-210	2.31e-07	1.59e-06	1.32e-07	0.00e+00	1.92e-05	1.11e-03	2.95e-05
Po-210	3.97e-04	8.60e-04	9.58e-05	0.00e+00	2.95e-03	3.14e-02	4.19e-05
Ra-223	1.80e-04	2.77e-07	3.60e-05	0.00e+00	7.85e-06	2.55e-02	2.84e-04
Ra-224	1.98e-05	4.78e-08	3.96e-06	0.00e+00	1.35e-06	8.77e-03	3.01e-04
Ra-225	3.00e-04	3.56e-07	5.99e-05	0.00e+00	1.01e-05	2.92e-02	2.71e-04
Ra-226	1.25e-01	2.39e-06	9.14e-02	0.00e+00	6.77e-05	1.17e-01	2.94e-04
Ra-228	4.41e-02	1.23e-06	4.78e-02	0.00e+00	3.48e-05	1.61e-01	5.00e-05
Ac-225	4.23e-04	5.82e-04	2.84e-05	0.00e+00	6.63e-05	2.21e-02	2.52e-04
Ac-227	2.30e+00	3.05e-01	1.36e-01	0.00e+00	9.82e-02	2.41e-01	5.08e-05
Th-227	2.17e-04	3.92e-06	6.25e-06	0.00e+00	2.22e-05	3.77e-02	3.34e-04
Th-228	2.00e-01	3.39e-03	6.77e-03	0.00e+00	1.89e-02	1.01e+00	3.49e-04
Th-229	1.51e+01	4.34e-01	2.51e-01	0.00e+00	2.13e+00	3.62e+00	4.83e-05
Th-230	2.29e+00	1.31e-01	6.36e-02	0.00e+00	6.40e-01	6.21e-01	3.73e-05
Th-232	2.56e+00	1.12e-01	9.04e-04	0.00e+00	5.47e-01	5.96e-01	3.17e-05
Th-234	1.63e-06	9.56e-08	4.70e-08	0.00e+00	5.41e-07	1.89e-04	7.03e-05
Pa-231	5.08e+00	1.91e-01	1.98e-01	0.00e+00	1.07e+00	5.75e-02	4.44e-05
Pa-233	1.21e-06	2.42e-07	2.09e-07	0.00e+00	9.15e-07	3.52e-05	1.02e-05
U-232	5.14e-02	0.00e+00	3.66e-03	0.00e+00	5.56e-03	2.22e-01	4.21e-05
U-233	1.09e-02	0.00e+00	6.60e-04	0.00e+00	2.54e-03	5.32e-02	3.89e-05
U-234	1.04e-02	0.00e+00	6.46e-04	0.00e+00	2.49e-03	5.22e-02	3.81e-05
U-235	1.00e-02	0.00e+00	6.07e-04	0.00e+00	2.34e-03	4.90e-02	4.84e-05
U-236	1.00e-02	0.00e+00	6.20e-04	0.00e+00	2.39e-03	5.00e-02	3.57e-05
U-237	3.67e-08	0.00e+00	9.77e-09	0.00e+00	1.51e-07	1.02e-05	1.20e-05
U-238	9.58e-03	0.00e+00	5.67e-04	0.00e+00	2.18e-03	4.58e-02	3.41e-05
Np-237	1.56e+00	1.00e+00	6.87e-02	0.00e+00	5.10e-01	5.22e-02	4.92e-05

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# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Inhalation Dose Conversion factors for Adult age group by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Np-238	2.96e-07	7.20e-08	4.61e-09	0.00e+00	2.72e-08	1.02e-05	2.13e-05
Np-239	2.87e-08	2.54e-08	1.55e-09	0.00e+00	8.75e-09	4.70e-06	1.49e-05
Pu-238	1.43e+00	9.71e-01	6.90e-02	0.00e+00	2.96e-01	1.82e-01	4.52e-05
Pu-239	1.66e+00	1.07e+00	7.75e-02	0.00e+00	3.30e-01	1.72e-01	4.13e-05
Pu-240	1.65e+00	1.07e+00	7.73e-02	0.00e+00	3.29e-01	1.72e-01	4.21e-05
Pu-241	3.42e-02	8.69e-03	1.29e-03	0.00e+00	5.93e-03	1.52e-04	8.65e-07
Pu-242	1.53e+00	1.03e+00	7.46e-02	0.00e+00	3.17e-01	1.65e-01	4.05e-05
Pu-244	1.79e+00	1.18e+00	8.54e-02	0.00e+00	3.64e-01	1.89e-01	6.03e-05
Am-241	1.68e+00	1.13e+00	6.71e-02	0.00e+00	5.04e-01	6.06e-02	4.60e-05
Am-242m	1.70e+00	1.06e+00	6.73e-02	0.00e+00	5.01e-01	2.44e-02	5.79e-05
Am-243	1.68e+00	1.10e+00	6.57e-02	0.00e+00	4.95e-01	5.75e-02	5.40e-05
Cm-242	2.22e-02	1.77e-02	9.84e-04	0.00e+00	4.48e-03	3.92e-02	4.91e-05
Cm-243	1.10e+00	7.61e-01	4.61e-02	0.00e+00	2.15e-01	6.31e-02	4.84e-05
Cm-244	8.37e-01	5.88e-01	3.51e-02	0.00e+00	1.64e-01	6.06e-02	4.68e-05
Cm-245	1.74e+00	1.14e+00	7.14e-02	0.00e+00	3.33e-01	5.85e-02	4.36e-05
Cm-246	1.73e+00	1.14e+00	7.13e-02	0.00e+00	3.33e-01	5.96e-02	4.29e-05
Cm-247	1.68e+00	1.12e+00	7.03e-02	0.00e+00	3.28e-01	5.85e-02	5.63e-05
Cm-248	1.40e+01	9.26e+00	5.79e-01	0.00e+00	2.70e+00	4.82e-01	9.09e-04
Cf-252	5.43e-01	0.00e+00	2.33e-02	0.00e+00	0.00e+00	1.99e-01	1.78e-04

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# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Inhalation Dose Conversion factors for Teen age group by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
H-3	0.00e+00	9.06e-08	9.06e-08	9.06e-08	9.06e-08	9.06e-08	9.06e-08
Be-10	2.78e-04	4.33e-05	7.09e-06	0.00e+00	0.00e+00	3.84e-04	1.77e-05
C-14	3.25e-06	6.09e-07	6.09e-07	6.09e-07	6.09e-07	6.09e-07	6.09e-07
N-13	8.65e-09	8.65e-09	8.65e-09	8.65e-09	8.65e-09	8.65e-09	8.65e-09
F-18	6.52e-07	0.00e+00	7.10e-08	0.00e+00	0.00e+00	0.00e+00	3.89e-08
Na-22	1.76e-05	1.76e-05	1.76e-05	1.76e-05	1.76e-05	1.76e-05	1.76e-05
Na-24	1.72e-06	1.72e-06	1.72e-06	1.72e-06	1.72e-06	1.72e-06	1.72e-06
P-32	2.36e-04	1.37e-05	8.95e-06	0.00e+00	0.00e+00	0.00e+00	1.16e-05
Ca-41	4.05e-05	0.00e+00	4.38e-06	0.00e+00	0.00e+00	1.01e-01	3.03e-07
Sc-46	7.24e-05	1.41e-04	4.18e-05	0.00e+00	1.35e-04	0.00e+00	2.98e-05
Cr-51	0.00e+00	0.00e+00	1.69e-08	9.37e-09	3.84e-09	2.62e-06	3.75e-07
Mn-54	0.00e+00	6.39e-06	1.05e-06	0.00e+00	1.59e-06	2.48e-04	8.35e-06
Mn-56	0.00e+00	2.12e-10	3.15e-11	0.00e+00	2.24e-10	1.90e-06	7.18e-06
Fe-55	4.18e-06	2.98e-06	6.93e-07	0.00e+00	0.00e+00	1.55e-05	7.99e-07
Fe-59	1.99e-06	4.62e-06	1.79e-06	0.00e+00	0.00e+00	1.91e-04	2.23e-05
Co-57	0.00e+00	1.18e-07	1.15e-07	0.00e+00	0.00e+00	7.33e-05	3.93e-06
Co-58	0.00e+00	2.59e-07	3.47e-07	0.00e+00	0.00e+00	1.68e-04	1.19e-05
Co-60	0.00e+00	1.89e-06	2.48e-06	0.00e+00	0.00e+00	1.09e-03	3.24e-05
Ni-59	5.44e-06	2.02e-06	9.24e-07	0.00e+00	0.00e+00	1.41e-05	6.48e-07
Ni-63	7.25e-05	5.43e-06	2.47e-06	0.00e+00	0.00e+00	3.84e-05	1.77e-06
Ni-65	2.73e-10	3.66e-11	1.59e-11	0.00e+00	0.00e+00	1.17e-06	4.59e-06
Cu-64	0.00e+00	2.54e-10	1.06e-10	0.00e+00	8.01e-10	1.39e-06	7.68e-06
Zn-65	4.82e-06	1.67e-05	7.80e-06	0.00e+00	1.08e-05	1.55e-04	5.83e-06
Zn-69	6.04e-12	1.15e-11	8.07e-13	0.00e+00	7.53e-12	1.98e-07	3.56e-08
Zn-69m	1.44e-09	3.39e-09	3.11e-10	0.00e+00	2.06e-09	3.92e-06	2.14e-05
Sa-79	0.00e+00	5.43e-07	8.71e-08	0.00e+00	8.13e-07	7.71e-05	3.53e-06
Br-82	0.00e+00	0.00e+00	2.28e-06	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Br-83	0.00e+00	0.00e+00	4.30e-08	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Br-84	0.00e+00	0.00e+00	5.41e-08	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Br-85	0.00e+00	0.00e+00	2.29e-09	0.00e+00	0.00e+00	0.00e+00	0.00e+00

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# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Inhalation Dose Conversion factors for Teen age group by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Rb-86	0.00e+00	2.38e-05	1.05e-05	0.00e+00	0.00e+00	0.00e+00	2.21e-06
Rb-87	0.00e+00	1.40e-05	4.58e-06	0.00e+00	0.00e+00	0.00e+00	3.05e-07
Rb-88	0.00e+00	6.82e-08	3.40e-08	0.00e+00	0.00e+00	0.00e+00	3.65e-15
Rb-89	0.00e+00	4.40e-08	2.91e-08	0.00e+00	0.00e+00	0.00e+00	4.22e-17
Sr-89	5.43e-05	0.00e+00	1.56e-06	0.00e+00	0.00e+00	3.02e-04	4.64e-05
Sr-90	4.14e-03	0.00e+00	8.33e-05	0.00e+00	0.00e+00	2.06e-03	9.56e-05
Sr-91	1.10e-08	0.00e+00	4.39e-10	0.00e+00	0.00e+00	7.59e-06	3.24e-05
Sr-92	1.19e-09	0.00e+00	5.08e-11	0.00e+00	0.00e+00	3.43e-06	1.49e-05
Y-90	3.73e-07	0.00e+00	1.00e-08	0.00e+00	0.00e+00	3.66e-05	6.99e-05
Y-91	8.26e-05	0.00e+00	2.21e-06	0.00e+00	0.00e+00	3.67e-04	5.11e-05
Y-91m	4.63e-11	0.00e+00	1.77e-12	0.00e+00	0.00e+00	4.00e-07	3.77e-09
Y-92	1.84e-09	0.00e+00	5.36e-11	0.00e+00	0.00e+00	3.35e-06	2.06e-05
Y-93	1.69e-08	0.00e+00	4.65e-10	0.00e+00	0.00e+00	1.04e-05	7.24e-05
Zr-93	6.83e-05	3.38e-06	1.84e-06	0.00e+00	1.16e-05	3.67e-05	1.60e-06
Zr-95	1.82e-05	5.73e-06	3.94e-06	0.00e+00	8.42e-06	3.36e-04	1.86e-05
Zr-97	1.72e-08	3.40e-09	1.57e-09	0.00e+00	5.15e-09	1.62e-05	7.88e-05
Nb-93m	4.14e-05	1.36e-05	3.41e-06	0.00e+00	1.59e-05	5.36e-05	2.52e-06
Nb-95	2.32e-06	1.29e-06	7.08e-07	0.00e+00	1.25e-06	9.39e-05	1.21e-05
Nb-97	3.92e-11	9.72e-12	3.55e-12	0.00e+00	1.14e-11	4.91e-07	2.71e-07
Mo-93	0.00e+00	1.66e-06	4.52e-08	0.00e+00	5.06e-07	8.81e-05	3.99e-06
Mo-99	0.00e+00	2.11e-08	4.03e-09	0.00e+00	5.14e-08	1.92e-05	3.36e-05
Tc-101	7.40e-15	1.05e-14	1.03e-13	0.00e+00	1.90e-13	8.34e-08	1.09e-16
Tc-99	4.48e-08	6.58e-08	1.79e-08	0.00e+00	8.35e-07	1.74e-04	7.99e-06
Tc-99m	1.73e-13	4.83e-13	6.24e-12	0.00e+00	7.20e-12	1.44e-07	7.66e-07
Ru-103	2.63e-07	0.00e+00	1.12e-07	0.00e+00	9.29e-07	9.79e-05	1.36e-05
Ru-105	1.40e-10	0.00e+00	5.42e-11	0.00e+00	1.76e-10	2.27e-06	1.13e-05
Ru-106	1.23e-05	0.00e+00	1.55e-06	0.00e+00	2.38e-05	2.01e-03	1.20e-04
Rh-105	1.32e-09	9.48e-10	6.24e-10	0.00e+00	4.04e-09	4.09e-06	1.23e-05
Pd-107	0.00e+00	1.17e-07	8.39e-09	0.00e+00	9.39e-07	1.63e-05	7.49e-07
Pd-109	0.00e+00	6.56e-10	1.66e-10	0.00e+00	3.36e-09	3.19e-06	1.96e-05

Conversion factors are in units of mrem per pCi inhaled.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Inhalation Dose Conversion factors for Teen age group by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Ag-110m	1.73e-06	1.64e-06	9.99e-07	0.00e+00	3.13e-06	8.44e-04	3.41e-05
Ag-111	6.07e-08	2.52e-08	1.26e-08	0.00e+00	8.17e-08	4.00e-05	3.00e-05
Cd-113m	0.00e+00	2.17e-04	7.10e-06	0.00e+00	2.43e-04	3.59e-04	1.68e-05
Cd-115m	0.00e+00	3.48e-05	1.14e-06	0.00e+00	2.82e-05	3.03e-04	5.10e-05
Sn-123	4.31e-05	9.44e-07	1.40e-06	7.55e-07	0.00e+00	4.96e-04	4.16e-05
Sn-125	1.66e-06	4.42e-08	9.99e-08	3.45e-08	0.00e+00	1.26e-04	7.29e-05
Sn-126	2.18e-04	5.39e-06	8.24e-06	1.42e-06	0.00e+00	1.72e-03	1.68e-05
Sb-124	5.38e-06	9.92e-08	2.10e-06	1.22e-08	0.00e+00	4.81e-04	4.98e-05
Sb-125	9.23e-06	1.01e-07	2.15e-06	8.80e-09	0.00e+00	3.42e-04	1.24e-05
Sb-126	6.19e-07	1.27e-08	2.23e-07	3.50e-09	0.00e+00	1.55e-04	6.01e-05
Sb-127	4.64e-08	9.92e-10	1.75e-08	5.21e-10	0.00e+00	3.31e-05	3.94e-05
Te-125m	6.10e-07	2.80e-07	8.34e-08	1.75e-07	0.00e+00	6.70e-05	9.38e-06
Te-127	2.51e-10	1.14e-10	5.52e-11	1.77e-10	9.10e-10	1.40e-06	1.01e-05
Te-127m	2.25e-06	1.02e-06	2.73e-07	5.48e-07	8.17e-06	2.07e-04	1.99e-05
Te-129	8.87e-12	4.22e-12	2.20e-12	6.48e-12	3.32e-11	4.12e-07	2.02e-07
Te-129m	1.74e-06	8.23e-07	2.81e-07	5.72e-07	6.49e-06	2.47e-04	5.06e-05
Te-131	1.97e-12	1.04e-12	6.30e-13	1.55e-12	7.72e-12	2.92e-07	1.89e-09
Te-131m	1.23e-08	7.51e-09	5.03e-09	9.06e-09	5.49e-08	2.97e-05	7.76e-05
Te-132	4.50e-08	3.63e-08	2.74e-08	3.07e-08	2.44e-07	5.61e-05	5.79e-05
Te-133m	1.01e-11	7.33e-12	5.71e-12	8.18e-12	5.07e-11	8.71e-07	1.23e-07
Te-134	5.31e-12	4.35e-12	3.64e-12	4.46e-12	2.91e-11	6.75e-07	1.37e-09
I-129	3.53e-06	2.94e-06	4.90e-06	3.66e-03	5.25e-06	0.00e+00	2.29e-07
I-130	7.80e-07	2.24e-06	8.96e-07	1.86e-04	3.44e-06	0.00e+00	1.14e-06
I-131	4.43e-06	6.14e-06	3.30e-06	1.83e-03	1.05e-05	0.00e+00	8.11e-07
I-132	1.99e-07	5.47e-07	1.97e-07	1.89e-05	8.65e-07	0.00e+00	1.59e-07
I-133	1.52e-06	2.56e-06	7.78e-07	3.65e-04	4.49e-06	0.00e+00	1.29e-06
I-134	1.11e-07	2.90e-07	1.05e-07	4.94e-06	4.58e-07	0.00e+00	2.55e-09
I-135	4.62e-07	1.18e-06	4.36e-07	7.76e-05	1.86e-06	0.00e+00	8.69e-07
Cs-134	6.28e-05	1.41e-04	6.86e-05	0.00e+00	4.69e-05	1.83e-05	1.22e-06
Cs-134m	2.20e-08	4.35e-08	2.35e-08	0.00e+00	2.54e-08	4.56e-09	2.02e-08

Conversion factors are in units of mrem per pCi inhaled.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Inhalation Dose Conversion factors for Teen age group by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Cs-135	2.08e-05	1.82e-05	4.47e-06	0.00e+00	7.30e-06	2.70e-06	2.23e-07
Cs-136	6.44e-06	2.42e-05	1.71e-05	0.00e+00	1.38e-05	2.22e-06	1.36e-06
Cs-137	8.38e-05	1.06e-04	3.89e-05	0.00e+00	3.80e-05	1.51e-05	1.06e-06
Cs-138	5.82e-08	1.07e-07	5.58e-08	0.00e+00	8.28e-08	9.84e-09	3.38e-11
Cs-139	3.65e-08	5.12e-08	1.97e-08	0.00e+00	4.34e-08	4.86e-09	1.66e-23
Ba-139	1.67e-10	1.18e-13	4.87e-12	0.00e+00	1.11e-13	8.08e-07	8.06e-07
Ba-140	6.84e-06	8.38e-09	4.40e-07	0.00e+00	2.85e-09	2.54e-04	2.86e-05
Ba-141	1.78e-11	1.32e-14	5.93e-13	0.00e+00	1.23e-14	4.11e-07	9.33e-14
Ba-142	4.62e-12	4.63e-15	2.84e-13	0.00e+00	3.92e-15	2.39e-07	5.99e-20
La-140	5.99e-08	2.95e-08	7.82e-09	0.00e+00	0.00e+00	2.68e-05	6.09e-05
La-141	7.63e-10	2.35e-10	3.87e-11	0.00e+00	0.00e+00	2.31e-06	1.54e-05
La-142	1.20e-10	5.31e-11	1.32e-11	0.00e+00	0.00e+00	1.27e-06	1.50e-06
Ce-141	3.55e-06	2.37e-06	2.71e-07	0.00e+00	1.11e-06	7.67e-05	1.58e-05
Ce-143	3.32e-08	2.42e-08	2.70e-09	0.00e+00	1.08e-08	1.63e-05	3.19e-05
Ce-144	6.11e-04	2.53e-04	3.28e-05	0.00e+00	1.51e-04	1.67e-03	1.08e-04
Pr-143	1.67e-06	6.64e-07	8.28e-08	0.00e+00	3.86e-07	6.04e-05	2.67e-05
Pr-144	5.37e-12	2.20e-12	2.72e-13	0.00e+00	1.26e-12	2.19e-07	2.94e-14
Nd-147	9.83e-07	1.07e-06	6.41e-08	0.00e+00	6.28e-07	4.65e-05	2.28e-05
Pm-147	1.15e-04	1.10e-05	4.50e-06	0.00e+00	2.10e-05	1.14e-04	5.87e-06
Pm-148	5.44e-07	8.88e-08	4.48e-08	0.00e+00	1.60e-07	6.52e-05	6.14e-05
Pm-148m	1.32e-05	3.35e-06	2.62e-06	0.00e+00	5.07e-06	3.20e-04	4.10e-05
Pm-149	4.91e-08	6.89e-09	2.84e-09	0.00e+00	1.31e-08	1.24e-05	2.79e-05
Pm-151	1.20e-08	1.99e-09	1.01e-09	0.00e+00	3.57e-09	6.56e-06	2.27e-05
Sm-151	1.07e-04	2.10e-05	4.86e-06	0.00e+00	2.27e-05	7.68e-05	3.53e-06
Sm-153	2.43e-08	2.01e-08	1.47e-09	0.00e+00	6.56e-09	7.11e-06	1.77e-05
Eu-152	2.96e-04	7.19e-05	6.30e-05	0.00e+00	3.34e-04	5.01e-04	1.35e-05
Eu-154	9.43e-04	1.23e-04	8.60e-05	0.00e+00	5.44e-04	9.12e-04	3.34e-05
Eu-155	2.00e-04	1.96e-05	1.21e-05	0.00e+00	7.65e-05	1.51e-03	5.97e-05
Eu-156	2.70e-06	2.03e-06	3.30e-07	0.00e+00	1.36e-06	1.37e-04	4.56e-05
Tb-160	3.04e-05	0.00e+00	3.79e-06	0.00e+00	1.20e-05	2.97e-04	2.60e-05

Conversion factors are in units of mrem per pCi inhaled.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Inhalation Dose Conversion factors for Teen age group by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Ho-166m	4.40e-04	1.36e-04	9.87e-05	0.00e+00	2.00e-04	6.24e-04	1.68e-05
W-181	8.90e-09	2.88e-09	3.01e-10	0.00e+00	0.00e+00	2.95e-06	2.69e-07
W-185	2.78e-07	9.17e-08	9.73e-09	0.00e+00	0.00e+00	9.60e-05	1.14e-05
W-187	1.50e-09	1.22e-09	4.29e-10	0.00e+00	0.00e+00	5.92e-06	2.21e-05
Pb-210	3.09e-02	8.28e-03	1.07e-03	0.00e+00	2.95e-02	4.52e-02	1.60e-06
Bi-210	3.30e-07	2.26e-06	1.89e-07	0.00e+00	2.74e-05	1.91e-03	3.19e-05
Po-210	5.68e-04	1.22e-03	1.37e-04	0.00e+00	4.21e-03	5.41e-02	4.45e-05
Ra-223	2.57e-04	3.93e-07	5.14e-05	0.00e+00	1.12e-05	4.39e-02	3.04e-04
Ra-224	2.83e-05	6.77e-08	5.65e-06	0.00e+00	1.93e-06	1.51e-02	3.29e-04
Ra-225	4.28e-04	5.04e-07	8.56e-05	0.00e+00	1.44e-05	5.04e-02	2.89e-04
Ra-226	1.33e-01	3.38e-06	9.87e-02	0.00e+00	9.67e-05	2.02e-01	3.11e-04
Ra-228	5.34e-02	1.74e-06	5.88e-02	0.00e+00	4.97e-05	2.78e-01	5.30e-05
Ac-225	6.04e-04	8.25e-04	4.06e-05	0.00e+00	9.47e-05	3.81e-02	2.70e-04
Ac-227	2.49e+00	3.69e-01	1.48e-01	0.00e+00	1.07e-01	4.16e-01	5.38e-05
Th-227	3.09e-04	5.56e-06	8.93e-06	0.00e+00	3.18e-05	6.50e-02	3.57e-04
Th-228	2.60e-01	4.37e-03	8.78e-03	0.00e+00	2.45e-02	1.69e+00	3.70e-04
Th-229	1.54e+01	4.44e-01	2.56e-01	0.00e+00	2.18e+00	5.24e+00	5.12e-05
Th-230	2.34e+00	1.34e-01	6.49e-02	0.00e+00	6.55e-01	8.98e-01	3.95e-05
Th-232	2.61e+00	1.14e-01	9.21e-04	0.00e+00	5.60e-01	8.60e-01	3.36e-05
Th-234	2.32e-06	1.35e-07	6.71e-08	0.00e+00	7.73e-07	3.26e-04	7.49e-05
Pa-231	5.32e+00	2.00e-01	2.07e-01	0.00e+00	1.12e+00	9.91e-02	4.71e-05
Pa-233	1.68e-06	3.24e-07	2.89e-07	0.00e+00	1.22e-06	5.39e-05	1.00e-05
U-232	7.31e-02	0.00e+00	5.23e-03	0.00e+00	7.94e-03	3.84e-01	4.46e-05
U-233	1.55e-02	0.00e+00	9.42e-04	0.00e+00	3.63e-03	9.18e-02	4.12e-05
U-234	1.48e-02	0.00e+00	9.23e-04	0.00e+00	3.55e-03	8.99e-02	4.04e-05
U-235	1.42e-02	0.00e+00	8.67e-04	0.00e+00	3.34e-03	8.44e-02	5.13e-05
U-236	1.42e-02	0.00e+00	8.86e-04	0.00e+00	3.41e-03	8.62e-02	3.79e-05
U-237	5.25e-08	0.00e+00	1.40e-08	0.00e+00	2.16e-07	1.76e-05	1.29e-05
U-238	1.36e-02	0.00e+00	8.10e-04	0.00e+00	3.12e-03	7.89e-02	3.62e-05
Np-237	1.64e+00	1.06e+00	7.21e-02	0.00e+00	5.35e-01	8.99e-02	5.22e-05

Conversion factors are in units of mrem per pCi inhaled.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Inhalation Dose Conversion factors for Teen age group by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Np-238	4.23e-07	1.02e-07	6.59e-09	0.00e+00	3.88e-08	1.75e-05	2.38e-05
Np-239	4.23e-08	3.60e-08	2.21e-09	0.00e+00	1.25e-08	8.11e-06	1.65e-05
Pu-238	1.50e+00	1.03e+00	7.22e-02	0.00e+00	3.10e-01	3.12e-01	4.79e-05
Pu-239	1.73e+00	1.12e+00	8.05e-02	0.00e+00	3.44e-01	2.93e-01	4.37e-05
Pu-240	1.72e+00	1.12e+00	8.04e-02	0.00e+00	3.43e-01	2.93e-01	4.46e-05
Pu-241	3.74e-02	9.56e-03	1.40e-03	0.00e+00	6.47e-03	2.60e-04	9.17e-07
Pu-242	1.60e+00	1.08e+00	7.75e-02	0.00e+00	3.31e-01	2.82e-01	4.29e-05
Pu-244	1.87e+00	1.24e+00	8.88e-02	0.00e+00	3.79e-01	3.23e-01	6.39e-05
Am-241	1.77e+00	1.20e+00	7.10e-02	0.00e+00	5.32e-01	1.05e-01	4.88e-05
Am-242m	1.79e+00	1.13e+00	7.15e-02	0.00e+00	5.30e-01	4.21e-02	6.14e-05
Am-243	1.77e+00	1.17e+00	6.95e-02	0.00e+00	5.21e-01	9.91e-02	5.72e-05
Cm-242	3.17e-02	2.51e-02	1.41e-03	0.00e+00	6.40e-03	6.76e-02	5.21e-05
Cm-243	1.19e+00	8.30e-01	5.00e-02	0.00e+00	2.34e-01	1.09e-01	5.13e-05
Cm-244	9.19e-01	6.53e-01	3.88e-02	0.00e+00	1.81e-01	1.05e-01	4.96e-05
Cm-245	1.83e+00	1.22e+00	7.53e-02	0.00e+00	3.52e-01	1.01e-01	4.63e-05
Cm-246	1.81e+00	1.22e+00	7.52e-02	0.00e+00	3.51e-01	1.03e-01	4.54e-05
Cm-247	1.77e+00	1.19e+00	7.41e-02	0.00e+00	3.46e-01	1.01e-01	5.97e-05
Cm-248	1.47e+01	9.83e+00	6.11e-01	0.00e+00	2.85e+00	8.32e-01	9.63e-04
Cf-252	7.16e-01	0.00e+00	3.07e-02	0.00e+00	0.00e+00	3.43e-01	1.89e-04

Conversion factors are in units of mrem per pCi inhaled.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Inhalation Dose Conversion factors for Child age group by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
H-3	0.00e+00	1.73e-07	1.73e-07	1.73e-07	1.73e-07	1.73e-07	1.73e-07
Be-10	8.43e-04	9.83e-05	2.12e-05	0.00e+00	0.00e+00	7.41e-04	1.72e-05
C-14	9.70e-06	1.82e-06	1.82e-06	1.82e-06	1.82e-06	1.82e-06	1.82e-06
N-13	2.33e-08	2.33e-08	2.33e-08	2.33e-08	2.33e-08	2.33e-08	2.33e-08
F-18	1.88e-06	0.00e+00	1.85e-07	0.00e+00	0.00e+00	0.00e+00	3.37e-07
Na-22	4.41e-05	4.41e-05	4.41e-05	4.41e-05	4.41e-05	4.41e-05	4.41e-05
Na-24	4.35e-06	4.35e-06	4.35e-06	4.35e-06	4.35e-06	4.35e-06	4.35e-06
P-32	7.04e-04	3.09e-05	2.67e-05	0.00e+00	0.00e+00	0.00e+00	1.14e-05
Ca-41	7.06e-05	0.00e+00	7.70e-06	0.00e+00	0.00e+00	7.21e-02	2.94e-07
Sc-46	1.97e-04	2.70e-04	1.04e-04	0.00e+00	2.39e-04	0.00e+00	2.45e-05
Cr-51	0.00e+00	0.00e+00	4.17e-08	2.31e-08	6.57e-09	4.59e-06	2.93e-07
Mn-54	0.00e+00	1.16e-05	2.57e-06	0.00e+00	2.71e-06	4.26e-04	6.19e-06
Mn-56	0.00e+00	4.48e-10	8.43e-11	0.00e+00	4.52e-10	3.55e-06	3.33e-05
Fe-55	1.28e-05	6.80e-06	2.10e-06	0.00e+00	0.00e+00	3.00e-05	7.75e-07
Fe-59	5.59e-06	9.04e-06	4.51e-06	0.00e+00	0.00e+00	3.43e-04	1.91e-05
Co-57	0.00e+00	2.44e-07	2.88e-07	0.00e+00	0.00e+00	1.37e-04	3.58e-06
Co-58	0.00e+00	4.79e-07	8.55e-07	0.00e+00	0.00e+00	2.99e-04	9.29e-06
Co-60	0.00e+00	3.55e-06	6.12e-06	0.00e+00	0.00e+00	1.91e-03	2.60e-05
Ni-59	1.66e-05	4.67e-06	2.83e-06	0.00e+00	0.00e+00	2.73e-05	6.29e-07
Ni-63	2.22e-04	1.25e-05	7.56e-06	0.00e+00	0.00e+00	7.43e-05	1.71e-06
Ni-65	8.08e-10	7.99e-11	4.44e-11	0.00e+00	0.00e+00	2.21e-06	2.27e-05
Cu-64	0.00e+00	5.39e-10	2.90e-10	0.00e+00	1.63e-09	2.59e-06	9.92e-06
Zn-65	1.15e-05	3.06e-05	1.90e-05	0.00e+00	1.93e-05	2.69e-04	4.41e-06
Zn-69	1.81e-11	2.61e-11	2.41e-12	0.00e+00	1.58e-11	3.84e-07	2.75e-06
Zn-69m	4.26e-09	7.28e-09	8.59e-10	0.00e+00	4.22e-09	7.36e-06	2.71e-05
Se-79	0.00e+00	1.23e-06	2.60e-07	0.00e+00	1.71e-06	1.49e-04	3.43e-06
Br-82	0.00e+00	0.00e+00	5.66e-06	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Br-83	0.00e+00	0.00e+00	1.28e-07	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Br-84	0.00e+00	0.00e+00	1.48e-07	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Br-85	0.00e+00	0.00e+00	6.84e-09	0.00e+00	0.00e+00	0.00e+00	0.00e+00

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# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Inhalation Dose Conversion factors for Child age group by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Rb-86	0.00e+00	5.36e-05	3.09e-05	0.00e+00	0.00e+00	0.00e+00	2.16e-06
Rb-87	0.00e+00	3.16e-05	1.37e-05	0.00e+00	0.00e+00	0.00e+00	2.96e-07
Rb-88	0.00e+00	1.52e-07	9.90e-08	0.00e+00	0.00e+00	0.00e+00	4.66e-09
Rb-89	0.00e+00	9.33e-08	7.83e-08	0.00e+00	0.00e+00	0.00e+00	5.11e-10
Sr-89	1.62e-04	0.00e+00	4.66e-06	0.00e+00	0.00e+00	5.83e-04	4.52e-05
Sr-90	1.04e-02	0.00e+00	2.07e-04	0.00e+00	0.00e+00	3.99e-03	9.28e-05
Sr-91	3.28e-08	0.00e+00	1.24e-09	0.00e+00	0.00e+00	1.44e-05	4.70e-05
Sr-92	3.54e-09	0.00e+00	1.42e-10	0.00e+00	0.00e+00	6.49e-06	6.55e-05
Y-90	1.11e-06	0.00e+00	2.99e-08	0.00e+00	0.00e+00	7.07e-05	7.24e-05
Y-91	2.47e-04	0.00e+00	6.59e-06	0.00e+00	0.00e+00	7.10e-04	4.97e-05
Y-91m	1.37e-10	0.00e+00	4.98e-12	0.00e+00	0.00e+00	7.60e-07	4.64e-07
Y-92	5.50e-09	0.00e+00	1.57e-10	0.00e+00	0.00e+00	6.46e-06	6.46e-05
Y-93	5.04e-08	0.00e+00	1.38e-09	0.00e+00	0.00e+00	2.01e-05	1.05e-04
Zr-93	2.07e-04	7.80e-06	5.55e-06	0.00e+00	3.00e-05	7.10e-05	1.47e-06
Zr-95	5.13e-05	1.13e-05	1.00e-05	0.00e+00	1.61e-05	6.03e-04	1.65e-05
Zr-97	5.07e-08	7.34e-09	4.32e-09	0.00e+00	1.05e-08	3.06e-05	9.49e-05
Nb-93m	1.27e-04	3.17e-05	1.04e-05	0.00e+00	3.44e-05	1.04e-04	2.45e-06
Nb-95	6.35e-06	2.48e-06	1.77e-06	0.00e+00	2.33e-06	1.66e-04	1.00e-05
Nb-97	1.16e-10	2.08e-11	9.74e-12	0.00e+00	2.31e-11	9.23e-07	7.52e-06
Mo-93	0.00e+00	3.76e-06	1.35e-07	0.00e+00	1.06e-06	1.70e-04	3.78e-06
Mo-99	0.00e+00	4.66e-08	1.15e-08	0.00e+00	1.06e-07	3.66e-05	3.42e-05
Tc-101	2.19e-14	2.30e-14	2.91e-13	0.00e+00	3.92e-13	1.58e-07	4.41e-09
Tc-99	1.34e-07	1.49e-07	5.35e-08	0.00e+00	1.75e-06	3.37e-04	7.75e-06
Tc-99m	4.81e-13	9.41e-13	1.56e-11	0.00e+00	1.37e-11	2.57e-07	1.30e-06
Ru-103	7.55e-07	0.00e+00	2.90e-07	0.00e+00	1.90e-06	1.79e-04	1.21e-05
Ru-105	4.13e-10	0.00e+00	1.50e-10	0.00e+00	3.63e-10	4.30e-06	2.69e-05
Ru-106	3.68e-05	0.00e+00	4.57e-06	0.00e+00	4.97e-05	3.87e-03	1.16e-04
Rh-105	3.91e-09	2.10e-09	1.79e-09	0.00e+00	8.39e-09	7.82e-06	1.33e-05
Pd-107	0.00e+00	2.65e-07	2.51e-08	0.00e+00	1.97e-06	3.16e-05	7.26e-07
Pd-109	0.00e+00	1.48e-09	4.95e-10	0.00e+00	7.06e-09	6.16e-06	2.59e-05

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# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Inhalation Dose Conversion factors for Child age group by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Ag-110m	4.56e-06	3.08e-06	2.47e-06	0.00e+00	5.74e-06	1.48e-03	2.71e-05
Ag-111	1.81e-07	5.68e-08	3.75e-08	0.00e+00	1.71e-07	7.73e-05	2.98e-05
Cd-113m	0.00e+00	4.93e-04	2.12e-05	0.00e+00	5.13e-04	6.94e-04	1.63e-05
Cd-115m	0.00e+00	7.88e-05	3.39e-06	0.00e+00	5.93e-05	5.86e-04	4.97e-05
Sn-123	1.29e-04	2.14e-06	4.19e-06	2.27e-06	0.00e+00	9.59e-04	4.05e-05
Sn-125	4.95e-06	9.94e-08	2.95e-07	1.03e-07	0.00e+00	2.43e-04	7.17e-05
Sn-126	6.23e-04	1.04e-05	2.36e-05	2.84e-06	0.00e+00	3.02e-03	1.63e-05
Sb-124	1.55e-05	2.00e-07	5.41e-06	3.41e-08	0.00e+00	8.76e-04	4.43e-05
Sb-125	2.66e-05	2.05e-07	5.59e-06	2.46e-08	0.00e+00	6.27e-04	1.09e-05
Sb-126	1.72e-06	2.62e-08	6.16e-07	1.00e-08	0.00e+00	2.86e-04	5.67e-05
Sb-127	1.36e-07	2.09e-09	4.70e-08	1.51e-09	0.00e+00	6.17e-05	3.82e-05
Te-125m	1.82e-06	6.29e-07	2.47e-07	5.20e-07	0.00e+00	1.29e-04	9.13e-06
Te-127	7.49e-10	2.57e-10	1.65e-10	5.30e-10	1.91e-09	2.71e-06	1.52e-05
Te-127m	6.72e-06	2.31e-06	8.16e-07	1.64e-06	1.72e-05	4.00e-04	1.93e-05
Te-129	2.64e-11	9.45e-12	6.44e-12	1.93e-11	6.94e-11	7.93e-07	6.89e-06
Te-129m	5.19e-06	1.85e-06	8.22e-07	1.71e-06	1.36e-05	4.76e-04	4.91e-05
Te-131	5.87e-12	2.28e-12	1.78e-12	4.59e-12	1.59e-11	5.55e-07	3.60e-07
Te-131m	3.63e-08	1.60e-08	1.37e-08	2.64e-08	1.08e-07	5.56e-05	8.32e-05
Te-132	1.30e-07	7.36e-08	7.12e-08	8.58e-08	4.79e-07	1.02e-04	3.72e-05
Te-133m	2.93e-11	1.51e-11	1.50e-11	2.32e-11	1.01e-10	1.60e-06	4.77e-06
Te-134	1.53e-11	8.81e-12	9.40e-12	1.24e-11	5.71e-11	1.23e-06	4.87e-07
I-129	1.05e-05	6.40e-06	5.71e-06	4.28e-03	1.08e-05	0.00e+00	2.15e-07
I-130	2.21e-06	4.43e-06	2.28e-06	4.99e-04	6.61e-06	0.00e+00	1.38e-06
I-131	1.30e-05	1.30e-05	7.37e-06	4.39e-03	2.13e-05	0.00e+00	7.68e-07
I-132	5.72e-07	1.10e-06	5.07e-07	5.23e-05	1.69e-06	0.00e+00	8.65e-07
I-133	4.48e-06	5.49e-06	2.08e-06	1.04e-03	9.13e-06	0.00e+00	1.48e-06
I-134	3.17e-07	5.84e-07	2.69e-07	1.37e-05	8.92e-07	0.00e+00	2.58e-07
I-135	1.33e-06	2.36e-06	1.12e-06	2.14e-04	3.62e-06	0.00e+00	1.20e-06
Cs-134	1.76e-04	2.74e-04	6.07e-05	0.00e+00	8.93e-05	3.27e-05	1.04e-06
Cs-134m	6.33e-08	8.92e-08	6.12e-08	0.00e+00	4.94e-08	8.35e-09	7.92e-08

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# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Inhalation Dose Conversion factors for Child age group by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Cs-135	6.23e-05	4.13e-05	4.45e-06	0.00e+00	1.53e-05	5.22e-06	2.17e-07
Cs-136	1.76e-05	4.62e-05	3.14e-05	0.00e+00	2.58e-05	3.93e-06	1.13e-06
Cs-137	2.45e-04	2.23e-04	3.47e-05	0.00e+00	7.63e-05	2.81e-05	9.78e-07
Cs-138	1.71e-07	2.27e-07	1.50e-07	0.00e+00	1.68e-07	1.84e-08	7.29e-08
Cs-139	1.09e-07	1.15e-07	5.80e-08	0.00e+00	9.08e-08	9.36e-09	7.23e-12
Ba-139	4.98e-10	2.66e-13	1.45e-11	0.00e+00	2.33e-13	1.56e-06	1.56e-05
Ba-140	2.00e-05	1.75e-08	1.17e-06	0.00e+00	5.71e-09	4.71e-04	2.75e-05
Ba-141	5.29e-11	2.95e-14	1.72e-12	0.00e+00	2.56e-14	7.89e-07	7.44e-08
Ba-142	1.35e-11	9.73e-15	7.54e-13	0.00e+00	7.87e-15	4.44e-07	7.41e-10
La-140	1.74e-07	6.08e-08	2.04e-08	0.00e+00	0.00e+00	4.94e-05	6.10e-05
La-141	2.28e-09	5.31e-10	1.15e-10	0.00e+00	0.00e+00	4.48e-06	4.37e-05
La-142	3.50e-10	1.11e-10	3.49e-11	0.00e+00	0.00e+00	2.35e-06	2.05e-05
Ce-141	1.06e-05	5.28e-06	7.83e-07	0.00e+00	2.31e-06	1.47e-04	1.53e-05
Ce-143	9.89e-08	5.37e-08	7.77e-09	0.00e+00	2.26e-08	3.12e-05	3.44e-05
Ce-144	1.83e-03	5.72e-04	9.77e-05	0.00e+00	3.17e-04	3.23e-03	1.05e-04
Pr-143	4.99e-06	1.50e-06	2.47e-07	0.00e+00	8.11e-07	1.17e-04	2.63e-05
Pr-144	1.61e-11	4.99e-12	8.10e-13	0.00e+00	2.64e-12	4.23e-07	5.32e-08
Nd-147	2.92e-06	2.36e-06	1.84e-07	0.00e+00	1.30e-06	8.87e-05	2.22e-05
Pm-147	3.52e-04	2.52e-05	1.36e-05	0.00e+00	4.45e-05	2.20e-04	5.70e-06
Pm-148	1.61e-06	1.94e-07	1.25e-07	0.00e+00	3.30e-07	1.24e-04	6.01e-05
Pm-148m	3.31e-05	6.55e-06	6.55e-06	0.00e+00	9.74e-06	5.72e-04	3.58e-05
Pm-149	1.47e-07	1.56e-08	8.45e-09	0.00e+00	2.75e-08	2.40e-05	2.92e-05
Pm-151	3.57e-08	4.33e-09	2.82e-09	0.00e+00	7.35e-09	1.24e-05	2.50e-05
Sm-151	3.14e-04	4.75e-05	1.49e-05	0.00e+00	4.89e-05	1.48e-04	3.43e-06
Sm-153	7.24e-08	4.51e-08	4.35e-09	0.00e+00	1.37e-08	1.37e-05	1.87e-05
Eu-152	7.42e-04	1.37e-04	1.61e-04	0.00e+00	5.73e-04	9.00e-04	1.14e-05
Eu-154	2.74e-03	2.49e-04	2.27e-04	0.00e+00	1.09e-03	1.66e-03	2.98e-05
Eu-155	5.60e-04	4.05e-05	3.18e-05	0.00e+00	1.51e-04	2.79e-04	5.39e-05
Eu-156	7.89e-06	4.23e-06	8.75e-07	0.00e+00	2.72e-06	2.54e-04	4.24e-05
Tb-160	7.79e-05	0.00e+00	9.67e-06	0.00e+00	2.32e-05	5.34e-04	2.28e-05

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# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Inhalation Dose Conversion factors for Child age group by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Ho-166m	1.34e-03	2.81e-04	2.37e-04	0.00e+00	4.01e-04	1.13e-03	1.63e-05
W-181	2.66e-08	6.52e-09	8.99e-10	0.00e+00	0.00e+00	5.71e-06	2.61e-07
W-185	8.31e-07	2.08e-07	2.91e-08	0.00e+00	0.00e+00	1.86e-04	1.11e-05
W-187	4.41e-09	2.61e-09	1.17e-09	0.00e+00	0.00e+00	1.11e-05	2.46e-05
Pb-210	8.03e-02	1.85e-02	3.18e-03	0.00e+00	6.31e-02	8.74e-02	1.55e-06
Bi-210	9.85e-07	5.11e-06	5.65e-07	0.00e+00	5.76e-05	3.70e-03	3.21e-05
Po-210	1.70e-03	2.76e-03	4.09e-04	0.00e+00	8.85e-03	1.05e-01	4.32e-05
Ra-223	7.69e-04	8.89e-07	1.54e-04	0.00e+00	2.36e-05	8.48e-02	3.00e-04
Ra-224	8.44e-05	1.53e-07	1.69e-05	0.00e+00	4.06e-06	2.92e-02	3.34e-04
Ra-225	1.28e-03	1.14e-06	2.56e-04	0.00e+00	3.02e-05	9.74e-02	2.84e-04
Ra-226	2.34e-01	7.66e-06	1.92e-01	0.00e+00	2.03e-04	3.90e-01	3.02e-04
Ra-228	1.49e-01	3.94e-06	1.68e-01	0.00e+00	1.04e-04	5.37e-01	5.14e-05
Ac-225	1.81e-03	1.87e-03	1.21e-04	0.00e+00	1.99e-04	7.37e-02	2.67e-04
Ac-227	4.96e+00	8.05e-01	3.07e-01	0.00e+00	1.77e-01	8.04e-01	5.22e-05
Th-227	9.24e-04	1.26e-05	2.67e-05	0.00e+00	6.67e-05	1.26e-01	3.49e-04
Th-228	8.06e-01	1.04e-02	2.72e-02	0.00e+00	5.41e-02	3.34e+00	3.59e-04
Th-229	2.18e+01	5.74e-01	3.63e-01	0.00e+00	2.83e+00	1.08e+01	4.99e-05
Th-230	3.30e+00	1.73e-01	9.20e-02	0.00e+00	8.52e-01	1.85e+00	3.84e-05
Th-232	3.68e+00	1.47e-01	1.28e-03	0.00e+00	7.28e-01	1.77e+00	3.27e-05
Th-234	6.94e-06	3.07e-07	2.00e-07	0.00e+00	1.62e-06	6.31e-04	7.32e-05
Pa-231	8.62e+00	2.86e-01	3.43e-01	0.00e+00	1.56e+00	1.92e-01	4.57e-05
Pa-233	4.14e-06	6.48e-07	7.25e-07	0.00e+00	2.38e-06	9.77e-05	8.95e-06
U-232	2.19e-01	0.00e+00	1.56e-02	0.00e+00	1.67e-02	7.42e-01	4.33e-05
U-233	4.64e-02	0.00e+00	2.82e-03	0.00e+00	7.62e-03	1.77e-01	4.00e-05
U-234	4.46e-02	0.00e+00	2.76e-03	0.00e+00	7.47e-03	1.74e-01	3.92e-05
U-235	4.27e-02	0.00e+00	2.59e-03	0.00e+00	7.01e-03	1.63e-01	4.98e-05
U-236	4.27e-02	0.00e+00	2.65e-03	0.00e+00	7.16e-03	1.67e-01	3.67e-05
U-237	1.57e-07	0.00e+00	4.17e-08	0.00e+00	4.53e-07	3.40e-05	1.29e-05
U-238	4.09e-02	0.00e+00	2.42e-03	0.00e+00	6.55e-03	1.53e-01	3.51e-05
Np-237	2.72e+00	1.62e+00	1.19e-01	0.00e+00	7.41e-01	1.74e-01	5.06e-05

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Inhalation Dose Conversion factors for Child age group by nuclide.  
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Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Np-238	1.26e-06	2.30e-07	1.97e-08	0.00e+00	8.16e-08	3.39e-05	2.50e-05
Np-239	1.26e-07	8.14e-08	6.35e-09	0.00e+00	2.63e-08	1.57e-05	1.73e-05
Pu-238	2.55e+00	1.60e+00	1.21e-01	0.00e+00	4.47e-01	6.08e-01	4.65e-05
Pu-239	2.79e+00	1.68e+00	1.28e-01	0.00e+00	4.78e-01	5.72e-01	4.24e-05
Pu-240	2.79e+00	1.68e+00	1.27e-01	0.00e+00	4.77e-01	5.71e-01	4.33e-05
Pu-241	7.94e-02	1.75e-02	2.93e-03	0.00e+00	1.10e-02	5.06e-04	8.90e-07
Pu-242	2.59e+00	1.62e+00	1.23e-01	0.00e+00	4.60e-01	5.50e-01	4.16e-05
Pu-244	3.02e+00	1.85e+00	1.41e-01	0.00e+00	5.27e-01	6.30e-01	6.20e-05
Am-241	2.97e+00	1.84e+00	1.24e-01	0.00e+00	7.63e-01	2.02e-01	4.73e-05
Am-242m	3.07e+00	1.76e+00	1.27e-01	0.00e+00	7.71e-01	8.14e-02	5.96e-05
Am-243	2.94e+00	1.78e+00	1.20e-01	0.00e+00	7.42e-01	1.92e-01	5.55e-05
Cm-242	9.48e-02	5.68e-02	4.20e-03	0.00e+00	1.34e-02	1.31e-01	5.06e-05
Cm-243	2.32e+00	1.42e+00	9.95e-02	0.00e+00	3.74e-01	2.10e-01	4.98e-05
Cm-244	1.94e+00	1.18e+00	8.31e-02	0.00e+00	3.06e-01	2.02e-01	4.82e-05
Cm-245	3.05e+00	1.84e+00	1.28e-01	0.00e+00	5.03e-01	1.95e-01	4.49e-05
Cm-246	3.02e+00	1.84e+00	1.28e-01	0.00e+00	5.03e-01	1.99e-01	4.41e-05
Cm-247	2.94e+00	1.82e+00	1.26e-01	0.00e+00	4.95e-01	1.95e-01	5.80e-05
Cm-248	2.45e+01	1.50e+01	1.04e+00	0.00e+00	4.08e+00	1.61e+00	9.35e-04
Cf-252	2.18e+00	0.00e+00	9.33e-02	0.00e+00	0.00e+00	6.62e-01	1.84e-04

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# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Inhalation Dose Conversion factors for Infant age group by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
H-3	0.00e+00	2.63e-07	2.63e-07	2.63e-07	2.63e-07	2.63e-07	2.63e-07
Be-10	9.49e-04	1.25e-04	2.65e-05	0.00e+00	0.00e+00	1.49e-03	1.73e-05
C-14	1.89e-05	3.79e-06	3.79e-06	3.79e-06	3.79e-06	3.79e-06	3.79e-06
N-13	4.39e-08	4.39e-08	4.39e-08	4.39e-08	4.39e-08	4.39e-08	4.39e-08
F-18	3.92e-06	0.00e+00	3.33e-07	0.00e+00	0.00e+00	0.00e+00	6.10e-07
Na-22	7.37e-05	7.37e-05	7.37e-05	7.37e-05	7.37e-05	7.37e-05	7.37e-05
Na-24	7.54e-06	7.54e-06	7.54e-06	7.54e-06	7.54e-06	7.54e-06	7.54e-06
P-32	1.45e-03	8.03e-05	5.53e-05	0.00e+00	0.00e+00	0.00e+00	1.15e-05
Ca-41	7.48e-05	0.00e+00	8.16e-06	0.00e+00	0.00e+00	6.94e-02	2.96e-07
Sc-46	3.75e-04	5.41e-04	1.69e-04	0.00e+00	3.56e-04	0.00e+00	2.19e-05
Cr-51	0.00e+00	0.00e+00	6.39e-08	4.11e-08	9.45e-09	9.17e-06	2.55e-07
Mn-54	0.00e+00	1.81e-05	3.56e-06	0.00e+00	3.56e-06	7.14e-04	5.04e-06
Mn-56	0.00e+00	1.10e-09	1.58e-10	0.00e+00	7.86e-10	8.95e-06	5.12e-05
Fe-55	1.41e-05	8.39e-06	2.38e-06	0.00e+00	0.00e+00	6.21e-05	7.82e-07
Fe-59	9.69e-06	1.68e-05	6.77e-06	0.00e+00	0.00e+00	7.25e-04	1.77e-05
Co-57	0.00e+00	4.65e-07	4.58e-07	0.00e+00	0.00e+00	2.71e-04	3.47e-06
Co-58	0.00e+00	8.71e-07	1.30e-06	0.00e+00	0.00e+00	5.55e-04	7.95e-06
Co-60	0.00e+00	5.73e-06	8.41e-06	0.00e+00	0.00e+00	3.22e-03	2.28e-05
Ni-59	1.81e-05	5.44e-06	3.10e-06	0.00e+00	0.00e+00	5.48e-05	6.34e-07
Ni-63	2.42e-04	1.46e-05	8.29e-06	0.00e+00	0.00e+00	1.49e-04	1.73e-06
Ni-65	1.71e-09	2.03e-10	8.79e-11	0.00e+00	0.00e+00	5.80e-06	3.58e-05
Cu-64	0.00e+00	1.34e-09	5.53e-10	0.00e+00	2.84e-09	6.64e-06	1.07e-05
Zn-65	1.38e-05	4.47e-05	2.22e-05	0.00e+00	2.32e-05	4.62e-04	3.67e-05
Zn-69	3.85e-11	6.91e-11	5.13e-12	0.00e+00	2.87e-11	1.05e-06	9.44e-06
Zn-69m	8.98e-09	1.84e-08	1.67e-09	0.00e+00	7.45e-09	1.91e-05	2.92e-05
Se-79	0.00e+00	2.25e-06	4.20e-07	0.00e+00	2.47e-06	2.99e-04	3.46e-06
Br-82	0.00e+00	0.00e+00	9.49e-06	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Br-83	0.00e+00	0.00e+00	2.72e-07	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Br-84	0.00e+00	0.00e+00	2.86e-07	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Br-85	0.00e+00	0.00e+00	1.46e-08	0.00e+00	0.00e+00	0.00e+00	0.00e+00

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# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Inhalation Dose Conversion factors for Infant age group by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Rb-86	0.00e+00	1.36e-04	6.30e-05	0.00e+00	0.00e+00	0.00e+00	2.17e-06
Rb-87	0.00e+00	7.11e-05	2.64e-05	0.00e+00	0.00e+00	0.00e+00	2.99e-07
Rb-88	0.00e+00	3.98e-07	2.05e-07	0.00e+00	0.00e+00	0.00e+00	2.42e-07
Rb-89	0.00e+00	2.29e-07	1.47e-07	0.00e+00	0.00e+00	0.00e+00	4.87e-08
Sr-89	2.84e-04	0.00e+00	8.15e-06	0.00e+00	0.00e+00	1.45e-03	4.57e-05
Sr-90	1.11e-02	0.00e+00	2.23e-04	0.00e+00	0.00e+00	8.03e-03	9.36e-05
Sr-91	6.83e-08	0.00e+00	2.47e-09	0.00e+00	0.00e+00	3.76e-05	5.24e-05
Sr-92	7.50e-09	0.00e+00	2.79e-10	0.00e+00	0.00e+00	1.70e-05	1.00e-04
Y-90	2.35e-06	0.00e+00	6.30e-08	0.00e+00	0.00e+00	1.92e-04	7.43e-05
Y-91	4.20e-04	0.00e+00	1.12e-05	0.00e+00	0.00e+00	1.75e-03	5.02e-05
Y-91m	2.91e-10	0.00e+00	9.90e-12	0.00e+00	0.00e+00	1.99e-06	1.68e-06
Y-92	1.17e-08	0.00e+00	3.29e-10	0.00e+00	0.00e+00	1.75e-05	9.04e-05
Y-93	1.07e-07	0.00e+00	2.91e-09	0.00e+00	0.00e+00	5.46e-05	1.19e-04
Zr-93	2.24e-04	9.51e-06	6.18e-06	0.00e+00	3.19e-05	1.37e-04	1.48e-06
Zr-95	8.24e-05	1.99e-05	1.45e-05	0.00e+00	2.22e-05	1.25e-03	1.55e-05
Zr-97	1.07e-07	1.83e-08	8.36e-09	0.00e+00	1.85e-08	7.88e-05	1.00e-04
Nb-93m	1.38e-04	3.59e-05	1.15e-05	0.00e+00	3.68e-05	2.09e-04	2.47e-06
Nb-95	1.12e-05	4.59e-06	2.70e-06	0.00e+00	3.37e-06	3.42e-04	9.05e-06
Nb-97	2.44e-10	5.21e-11	1.88e-11	0.00e+00	4.07e-11	2.37e-06	1.92e-05
Mo-93	0.00e+00	6.46e-06	2.22e-07	0.00e+00	1.54e-06	3.40e-04	3.76e-06
Mo-99	0.00e+00	1.18e-07	2.31e-08	0.00e+00	1.89e-07	9.63e-05	3.48e-05
Tc-101	4.65e-14	5.88e-14	5.80e-13	0.00e+00	6.99e-13	4.17e-07	6.03e-07
Tc-99	2.09e-07	2.68e-07	8.85e-08	0.00e+00	2.49e-06	6.77e-04	7.82e-06
Tc-99m	9.98e-13	2.06e-12	2.66e-11	0.00e+00	2.22e-11	5.79e-07	1.45e-06
Ru-103	1.44e-06	0.00e+00	4.85e-07	0.00e+00	3.03e-06	3.94e-04	1.15e-05
Ru-105	8.74e-10	0.00e+00	2.93e-10	0.00e+00	6.42e-10	1.12e-05	3.46e-05
Ru-106	6.20e-05	0.00e+00	7.77e-06	0.00e+00	7.61e-05	8.26e-03	1.17e-04
Rh-105	8.26e-09	5.41e-09	3.63e-09	0.00e+00	1.50e-08	2.08e-05	1.37e-05
Pd-107	0.00e+00	4.92e-07	4.11e-08	0.00e+00	2.75e-06	6.34e-05	7.33e-07
Pd-109	0.00e+00	3.92e-09	1.05e-09	0.00e+00	1.28e-08	1.68e-05	2.85e-05

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# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Inhalation Dose Conversion factors for Infant age group by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Ag-110m	7.13e-06	5.16e-06	3.57e-06	0.00e+00	7.80e-06	2.62e-03	2.36e-05
Ag-111	3.75e-07	1.45e-07	7.75e-08	0.00e+00	3.05e-07	2.06e-04	3.02e-05
Cd-113m	0.00e+00	6.67e-04	2.64e-05	0.00e+00	5.80e-04	1.40e-03	1.65e-05
Cd-115m	0.00e+00	1.73e-04	6.19e-06	0.00e+00	9.41e-05	1.47e-03	5.02e-05
Sn-123	2.09e-04	4.21e-06	7.28e-06	4.27e-06	0.00e+00	2.22e-03	4.08e-05
Sn-125	1.01e-05	2.51e-07	6.00e-07	2.47e-07	0.00e+00	6.43e-04	7.26e-05
Sn-126	8.30e-04	1.44e-05	3.52e-05	3.84e-06	0.00e+00	4.93e-03	1.65e-05
Sb-124	2.71e-05	3.97e-07	8.56e-06	7.18e-08	0.00e+00	1.89e-03	4.22e-05
Sb-125	3.69e-05	3.41e-07	7.78e-06	4.45e-08	0.00e+00	1.17e-03	1.05e-05
Sb-126	3.08e-06	6.01e-08	1.11e-06	2.35e-08	0.00e+00	6.88e-04	5.33e-05
Sb-127	2.82e-07	5.04e-09	8.76e-08	3.60e-09	0.00e+00	1.54e-04	3.78e-05
Te-125m	3.40e-06	1.42e-06	4.70e-07	1.16e-06	0.00e+00	3.19e-04	9.22e-06
Te-127	1.59e-09	6.81e-10	3.49e-10	1.32e-09	3.47e-09	7.39e-06	1.74e-05
Te-127m	1.19e-05	4.93e-06	1.48e-06	3.48e-06	2.68e-05	9.37e-04	1.95e-05
Te-129	5.63e-11	2.48e-11	1.34e-11	4.82e-11	1.25e-10	2.14e-06	1.88e-05
Te-129m	1.01e-05	4.35e-06	1.59e-06	3.91e-06	2.27e-05	1.20e-03	4.93e-05
Te-131	1.24e-11	5.87e-12	3.57e-12	1.13e-11	2.85e-11	1.47e-06	5.87e-06
Te-131m	7.62e-08	3.93e-08	2.59e-08	6.38e-08	1.89e-07	1.42e-04	8.51e-05
Te-132	2.66e-07	1.69e-07	1.26e-07	1.99e-07	7.39e-07	2.43e-04	3.15e-05
Te-133m	6.13e-11	3.59e-11	2.74e-11	5.52e-11	1.72e-10	3.92e-06	1.59e-05
Te-134	3.18e-11	2.04e-11	1.68e-11	2.91e-11	9.59e-11	2.93e-06	2.53e-06
I-129	2.16e-05	1.59e-05	1.16e-05	1.04e-02	1.88e-05	0.00e+00	2.12e-07
I-130	4.54e-06	9.91e-06	3.98e-06	1.14e-03	1.09e-05	0.00e+00	1.42e-06
I-131	2.71e-05	3.17e-05	1.40e-05	1.06e-02	3.70e-05	0.00e+00	7.56e-07
I-132	1.21e-06	2.53e-06	8.99e-07	1.21e-04	2.82e-06	0.00e+00	1.36e-06
I-133	9.46e-06	1.37e-05	4.00e-06	2.54e-03	1.60e-05	0.00e+00	1.54e-06
I-134	6.58e-07	1.34e-06	4.75e-07	3.18e-05	1.49e-06	0.00e+00	9.21e-07
I-135	2.76e-06	5.43e-06	1.98e-06	4.97e-04	6.05e-06	0.00e+00	1.31e-06
Cs-134	2.83e-04	5.02e-04	5.32e-05	0.00e+00	1.36e-04	5.69e-05	9.53e-07
Cs-134m	1.32e-07	2.10e-07	1.11e-07	0.00e+00	8.50e-08	2.00e-08	1.16e-07

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Inhalation Dose Conversion factors for Infant age group by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Cs-135	1.00e-04	8.66e-05	4.73e-06	0.00e+00	2.58e-05	1.01e-05	2.18e-07
Cs-136	3.45e-05	9.61e-05	3.78e-05	0.00e+00	4.03e-05	8.40e-06	1.02e-06
Cs-137	3.92e-04	4.37e-04	3.25e-05	0.00e+00	1.23e-04	5.09e-05	9.53e-07
Cs-138	3.61e-07	5.58e-07	2.84e-07	0.00e+00	2.93e-07	4.67e-08	6.26e-07
Cs-139	2.32e-07	3.03e-07	1.22e-07	0.00e+00	1.65e-07	2.53e-08	1.33e-08
Ba-139	1.06e-09	7.03e-13	3.07e-11	0.00e+00	4.23e-13	4.25e-06	3.64e-05
Ba-140	4.00e-05	4.00e-08	2.07e-06	0.00e+00	9.59e-09	1.14e-03	2.74e-05
Ba-141	1.12e-10	7.70e-14	3.55e-12	0.00e+00	4.64e-14	2.12e-06	3.39e-06
Ba-142	2.84e-11	2.36e-14	1.40e-12	0.00e+00	1.36e-14	1.11e-06	4.95e-07
La-140	3.61e-07	1.43e-07	3.68e-08	0.00e+00	0.00e+00	1.20e-04	6.06e-05
La-141	4.85e-09	1.40e-09	2.45e-10	0.00e+00	0.00e+00	1.22e-05	5.96e-05
La-142	7.36e-10	2.69e-10	6.46e-11	0.00e+00	0.00e+00	5.87e-06	4.25e-05
Ce-141	1.98e-05	1.19e-05	1.42e-06	0.00e+00	3.75e-06	3.69e-04	1.54e-05
Ce-143	2.09e-07	1.38e-07	1.58e-08	0.00e+00	4.03e-08	8.30e-05	3.55e-05
Ce-144	2.28e-03	8.65e-04	1.26e-04	0.00e+00	3.84e-04	7.03e-03	1.06e-04
Pr-143	1.00e-05	3.74e-06	4.99e-07	0.00e+00	1.41e-06	3.09e-04	2.66e-05
Pr-144	3.42e-11	1.32e-11	1.72e-12	0.00e+00	4.80e-12	1.15e-06	3.06e-06
Nd-147	5.67e-06	5.81e-06	3.57e-07	0.00e+00	2.25e-06	2.30e-04	2.23e-05
Pm-147	3.91e-04	3.07e-05	1.56e-05	0.00e+00	4.93e-05	4.55e-04	5.75e-06
Pm-148	3.34e-06	4.82e-07	2.44e-07	0.00e+00	5.76e-07	3.20e-04	6.04e-05
Pm-148m	5.00e-05	1.24e-05	9.94e-06	0.00e+00	1.45e-05	1.22e-03	3.37e-05
Pm-149	3.10e-07	4.08e-08	1.78e-08	0.00e+00	4.96e-08	6.50e-05	3.01e-05
Pm-151	7.52e-08	1.10e-08	5.55e-09	0.00e+00	1.30e-08	3.25e-05	2.58e-05
Sm-151	3.38e-04	6.45e-05	1.63e-05	0.00e+00	5.24e-05	2.98e-04	3.46e-06
Sm-153	1.53e-07	1.18e-07	9.06e-09	0.00e+00	2.47e-08	3.70e-05	1.93e-05
Eu-152	7.83e-04	1.77e-04	1.72e-04	0.00e+00	5.94e-04	1.48e-03	9.88e-06
Eu-154	2.96e-03	3.46e-04	2.45e-04	0.00e+00	1.14e-03	3.05e-03	2.84e-05
Eu-155	5.97e-04	5.72e-05	3.46e-05	0.00e+00	1.58e-04	5.20e-04	5.19e-05
Eu-156	1.56e-05	9.59e-06	1.54e-06	0.00e+00	4.48e-06	6.12e-04	4.14e-05
Tb-160	1.12e-04	0.00e+00	1.40e-05	0.00e+00	3.20e-05	1.11e-03	2.14e-05

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Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Ho-166m	1.45e-03	3.07e-04	2.51e-04	0.00e+00	4.22e-04	2.05e-03	1.65e-05
W-181	4.86e-08	1.46e-08	1.67e-09	0.00e+00	0.00e+00	1.33e-05	2.63e-07
W-185	1.57e-06	4.83e-07	5.58e-08	0.00e+00	0.00e+00	4.48e-04	1.12e-05
W-187	9.26e-09	6.44e-09	2.23e-09	0.00e+00	0.00e+00	2.83e-05	2.54e-05
Pb-210	8.62e-02	2.02e-02	3.43e-03	0.00e+00	6.85e-02	1.76e-01	1.57e-06
Bi-210	2.06e-06	1.33e-05	1.18e-06	0.00e+00	1.03e-04	9.96e-03	3.27e-05
Po-210	2.98e-03	5.63e-03	7.12e-04	0.00e+00	1.30e-02	2.40e-01	4.36e-05
Ra-223	1.56e-03	2.26e-06	3.12e-04	0.00e+00	4.16e-05	2.25e-01	3.04e-04
Ra-224	1.77e-04	4.00e-07	3.54e-05	0.00e+00	7.30e-06	7.91e-02	3.42e-04
Ra-225	2.57e-03	2.88e-06	5.13e-04	0.00e+00	5.31e-05	2.57e-01	2.87e-04
Ra-226	2.48e-01	1.46e-05	2.05e-01	0.00e+00	2.94e-04	7.83e-01	3.05e-04
Ra-228	1.60e-01	7.61e-06	1.80e-01	0.00e+00	1.53e-04	1.09e+00	5.19e-05
Ac-225	3.69e-03	4.72e-03	2.48e-04	0.00e+00	3.49e-04	1.96e-01	2.71e-04
Ac-227	5.29e+00	8.76e-01	3.28e-01	0.00e+00	1.86e-01	1.62e+00	5.27e-05
Th-227	1.82e-03	3.03e-05	5.24e-05	0.00e+00	1.13e-04	3.27e-01	3.53e-04
Th-228	8.46e-01	1.10e-02	2.86e-02	0.00e+00	5.61e-02	4.65e+00	3.62e-04
Th-229	2.28e+01	5.94e-01	3.81e-01	0.00e+00	9.32e-01	1.27e+01	5.02e-05
Th-230	3.46e+00	1.79e-01	9.65e-02	0.00e+00	8.82e-01	2.18e+00	3.87e-05
Th-232	3.86e+00	1.53e-01	2.29e-03	0.00e+00	7.54e-01	2.09e+00	3.29e-05
Th-234	1.33e-05	7.17e-07	3.84e-07	0.00e+00	2.70e-06	1.62e-03	7.40e-05
Pa-231	9.10e+00	3.00e-01	3.62e-01	0.00e+00	1.62e+00	3.85e-01	4.61e-05
Pa-233	6.84e-06	1.32e-06	1.19e-06	0.00e+00	3.68e-06	2.19e-04	9.04e-06
U-232	2.57e-01	0.00e+00	2.13e-02	0.00e+00	2.40e-02	1.49e+00	4.36e-05
U-233	5.44e-02	0.00e+00	3.83e-03	0.00e+00	1.09e-02	3.56e-01	4.03e-05
U-234	5.22e-02	0.00e+00	3.75e-03	0.00e+00	1.07e-02	3.49e-01	3.95e-05
U-235	5.01e-02	0.00e+00	3.52e-03	0.00e+00	1.01e-02	3.28e-01	5.02e-05
U-236	5.01e-02	0.00e+00	3.60e-03	0.00e+00	1.03e-02	3.35e-01	3.71e-05
U-237	3.25e-07	0.00e+00	8.65e-08	0.00e+00	8.08e-07	9.13e-05	1.31e-05
U-238	4.79e-02	0.00e+00	3.29e-03	0.00e+00	9.40e-03	3.06e-01	3.54e-05
Np-237	2.88e+00	1.71e+00	1.26e-01	0.00e+00	7.69e-01	3.49e-01	5.10e-05

Conversion factors are in units of mrem per pCi inhaled.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Inhalation Dose Conversion factors for Infant age group by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Np-238	2.67e-06	6.05e-07	4.16e-08	0.00e+00	1.47e-07	9.19e-05	2.58e-05
Np-239	2.65e-07	2.13e-07	1.34e-08	0.00e+00	4.73e-08	4.25e-05	1.78e-05
Pu-238	2.69e+00	1.68e+00	1.27e-01	0.00e+00	4.64e-01	9.03e-01	4.69e-05
Pu-239	2.93e+00	1.76e+00	1.34e-01	0.00e+00	4.95e-01	8.47e-01	4.28e-05
Pu-240	2.93e+00	1.75e+00	1.34e-01	0.00e+00	4.94e-01	8.47e-01	4.36e-05
Pu-241	8.43e-02	1.85e-02	3.11e-03	0.00e+00	1.15e-02	7.62e-04	8.97e-07
Pu-242	2.72e+00	1.69e+00	1.29e-01	0.00e+00	4.77e-01	8.15e-01	4.20e-05
Pu-244	3.17e+00	1.94e+00	1.48e-01	0.00e+00	5.46e-01	9.33e-01	6.26e-05
Am-241	3.15e+00	1.95e+00	1.31e-01	0.00e+00	7.94e-01	4.06e-01	4.78e-05
Am-242m	3.25e+00	1.86e+00	1.35e-01	0.00e+00	8.03e-01	1.64e-01	6.01e-05
Am-243	3.10e+00	1.88e+00	1.27e-01	0.00e+00	7.72e-01	3.85e-01	5.60e-05
Cm-242	1.28e-01	8.65e-02	5.70e-03	0.00e+00	1.69e-02	2.97e-01	5.10e-05
Cm-243	2.47e+00	1.52e+00	1.06e-01	0.00e+00	3.91e-01	4.24e-01	5.02e-05
Cm-244	2.07e+00	1.27e+00	8.89e-02	0.00e+00	3.21e-01	4.08e-01	4.86e-05
Cm-245	3.22e+00	1.96e+00	1.36e-01	0.00e+00	5.23e-01	3.92e-01	4.53e-05
Cm-246	3.20e+00	1.96e+00	1.36e-01	0.00e+00	5.23e-01	3.99e-01	4.45e-05
Cm-247	3.11e+00	1.93e+00	1.33e-01	0.00e+00	5.15e-01	3.92e-01	5.85e-05
Cm-248	2.58e+01	1.59e+01	1.10e+00	0.00e+00	4.24e+00	3.23e+00	9.43e-04
Cf-252	2.37e+00	0.00e+00	1.01e-01	0.00e+00	0.00e+00	1.37e+00	1.85e-04

Conversion factors are in units of mrem per pCi inhaled.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Ingestion Dose Conversion factors for Adult age group by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
H-3	0.00e+00	5.99e-08	5.99e-08	5.99e-08	5.99e-08	5.99e-08	5.99e-08
Be-10	3.18e-06	4.91e-07	7.94e-08	0.00e+00	3.71e-07	0.00e+00	2.68e-05
C-14	2.84e-06	5.68e-07	5.68e-07	5.68e-07	5.68e-07	5.68e-07	5.68e-07
N-13	8.36e-09	8.36e-09	8.36e-09	8.36e-09	8.36e-09	8.36e-09	8.36e-09
F-18	6.24e-07	0.00e+00	6.92e-08	0.00e+00	0.00e+00	0.00e+00	1.85e-08
Na-22	1.74e-05	1.74e-05	1.74e-05	1.74e-05	1.74e-05	1.74e-05	1.74e-05
Na-24	1.70e-06	1.70e-06	1.70e-06	1.70e-06	1.70e-06	1.70e-06	1.70e-06
P-32	1.93e-04	1.20e-05	7.46e-06	0.00e+00	0.00e+00	0.00e+00	2.17e-05
Ca-41	1.85e-04	0.00e+00	2.00e-05	0.00e+00	0.00e+00	0.00e+00	1.84e-07
Sc-46	5.51e-09	1.07e-08	3.11e-09	0.00e+00	9.99e-09	0.00e+00	5.21e-05
Cr-51	0.00e+00	0.00e+00	2.66e-09	1.59e-09	5.86e-10	3.53e-09	6.69e-07
Mn-54	0.00e+00	4.57e-06	8.72e-07	0.00e+00	1.36e-06	0.00e+00	1.40e-05
Mn-56	0.00e+00	1.15e-07	2.04e-08	0.00e+00	1.46e-07	0.00e+00	3.67e-06
Fe-55	2.75e-06	1.90e-06	4.43e-07	0.00e+00	0.00e+00	1.06e-06	1.09e-06
Fe-59	4.34e-06	1.02e-05	3.91e-06	0.00e+00	0.00e+00	2.85e-06	3.40e-05
Co-57	0.00e+00	1.75e-07	2.91e-07	0.00e+00	0.00e+00	0.00e+00	4.44e-06
Co-58	0.00e+00	7.45e-07	1.67e-06	0.00e+00	0.00e+00	0.00e+00	1.51e-05
Co-60	0.00e+00	2.14e-06	4.72e-06	0.00e+00	0.00e+00	0.00e+00	4.02e-05
Ni-59	9.76e-06	3.35e-06	1.63e-06	0.00e+00	0.00e+00	0.00e+00	6.90e-07
Ni-63	1.30e-04	9.01e-06	4.36e-06	0.00e+00	0.00e+00	0.00e+00	1.88e-06
Ni-65	5.28e-07	6.86e-08	3.13e-08	0.00e+00	0.00e+00	0.00e+00	1.74e-06
Cu-64	0.00e+00	8.33e-08	3.91e-08	0.00e+00	2.10e-07	0.00e+00	7.10e-06
Zn-65	4.84e-06	1.54e-05	6.96e-06	0.00e+00	1.03e-05	0.00e+00	9.70e-06
Zn-69	1.03e-08	1.97e-08	1.37e-09	0.00e+00	1.28e-08	0.00e+00	2.96e-09
Zn-69m	1.70e-07	4.08e-07	3.73e-08	0.00e+00	2.47e-07	0.00e+00	2.49e-05
Se-79	0.00e+00	2.63e-06	4.39e-07	0.00e+00	4.55e-06	0.00e+00	5.38e-07
Br-82	0.00e+00	0.00e+00	2.26e-06	0.00e+00	0.00e+00	0.00e+00	2.59e-06
Br-83	0.00e+00	0.00e+00	4.02e-08	0.00e+00	0.00e+00	0.00e+00	5.79e-08
Br-84	0.00e+00	0.00e+00	5.21e-08	0.00e+00	0.00e+00	0.00e+00	4.09e-13
Br-85	0.00e+00	0.00e+00	2.14e-09	0.00e+00	0.00e+00	0.00e+00	0.00e+00

Conversion factors are in units of mrem per pCi ingested.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Ingestion Dose Conversion factors for Adult age group by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Rb-86	0.00e+00	2.11e-05	9.83e-06	0.00e+00	0.00e+00	0.00e+00	4.16e-06
Rb-87	0.00e+00	1.23e-05	4.28e-06	0.00e+00	0.00e+00	0.00e+00	5.76e-07
Rb-88	0.00e+00	6.05e-08	3.21e-08	0.00e+00	0.00e+00	0.00e+00	8.36e-19
Rb-89	0.00e+00	4.01e-08	2.82e-08	0.00e+00	0.00e+00	0.00e+00	2.33e-21
Sr-89	3.08e-04	0.00e+00	8.84e-06	0.00e+00	0.00e+00	0.00e+00	4.94e-05
Sr-90	8.71e-03	0.00e+00	1.75e-04	0.00e+00	0.00e+00	0.00e+00	2.19e-04
Sr-91	5.67e-06	0.00e+00	2.29e-07	0.00e+00	0.00e+00	0.00e+00	2.70e-05
Sr-92	2.15e-06	0.00e+00	9.30e-08	0.00e+00	0.00e+00	0.00e+00	4.26e-05
Y-90	9.62e-09	0.00e+00	2.58e-10	0.00e+00	0.00e+00	0.00e+00	1.02e-04
Y-91	1.41e-07	0.00e+00	3.77e-09	0.00e+00	0.00e+00	0.00e+00	7.76e-05
Y-91m	9.09e-11	0.00e+00	3.52e-12	0.00e+00	0.00e+00	0.00e+00	2.67e-10
Y-92	8.45e-10	0.00e+00	2.47e-11	0.00e+00	0.00e+00	0.00e+00	1.48e-05
Y-93	2.68e-09	0.00e+00	7.40e-11	0.00e+00	0.00e+00	0.00e+00	8.50e-05
Zr-93	4.18e-08	2.34e-09	1.09e-09	0.00e+00	8.87e-09	0.00e+00	2.43e-06
Zr-95	3.04e-08	9.75e-09	6.60e-09	0.00e+00	1.53e-08	0.00e+00	3.09e-05
Zr-97	1.68e-09	3.39e-10	1.55e-10	0.00e+00	5.12e-10	0.00e+00	1.05e-04
Nb-93m	2.55e-08	8.32e-09	2.05e-09	0.00e+00	9.57e-09	0.00e+00	3.84e-06
Nb-95	6.22e-09	3.46e-09	1.86e-09	0.00e+00	3.42e-09	0.00e+00	2.10e-05
Nb-97	5.22e-11	1.32e-11	4.82e-12	0.00e+00	1.54e-11	0.00e+00	4.87e-08
Mo-93	0.00e+00	7.51e-06	2.03e-07	0.00e+00	2.13e-06	0.00e+00	1.22e-06
Mo-99	0.00e+00	4.31e-06	8.20e-07	0.00e+00	9.76e-06	0.00e+00	9.99e-06
Tc-101	2.54e-10	3.66e-10	3.59e-09	0.00e+00	6.59e-09	1.87e-10	1.10e-21
Tc-99	1.25e-07	1.86e-07	5.02e-08	0.00e+00	2.34e-06	1.58e-08	6.08e-06
Tc-99m	2.47e-10	6.98e-10	8.89e-09	0.00e+00	1.06e-08	3.42e-10	4.13e-07
Ru-103	1.85e-07	0.00e+00	7.97e-08	0.00e+00	7.06e-07	0.00e+00	2.16e-05
Ru-105	1.54e-08	0.00e+00	6.08e-09	0.00e+00	1.99e-07	0.00e+00	9.42e-06
Ru-106	2.75e-06	0.00e+00	3.48e-07	0.00e+00	5.31e-06	0.00e+00	1.78e-04
Rh-105	1.21e-07	8.85e-08	5.83e-08	0.00e+00	3.76e-07	0.00e+00	1.41e-05
Pd-107	0.00e+00	1.47e-07	9.40e-09	0.00e+00	1.32e-06	0.00e+00	9.11e-07
Pd-109	0.00e+00	1.77e-07	3.99e-08	0.00e+00	1.01e-06	0.00e+00	1.96e-05

Conversion factors are in units of mrem per pCi ingested.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Ingestion Dose Conversion factors for Adult age group by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Ag-110m	1.60e-07	1.48e-07	8.79e-08	0.00e+00	2.91e-07	0.00e+00	6.04e-05
Ag-111	5.81e-08	2.43e-08	1.21e-08	0.00e+00	7.84e-08	0.00e+00	4.46e-05
Cd-113m	0.00e+00	3.18e-06	1.02e-07	0.00e+00	3.50e-06	0.00e+00	2.56e-05
Cd-115m	0.00e+00	1.84e-06	5.87e-08	0.00e+00	1.46e-06	0.00e+00	7.74e-05
Sn-123	3.11e-05	5.15e-07	7.59e-07	4.38e-07	0.00e+00	0.00e+00	6.33e-05
Sn-125	8.33e-06	1.68e-07	3.78e-07	1.39e-07	0.00e+00	0.00e+00	1.04e-04
Sn-126	8.45e-05	1.67e-06	2.40e-06	4.92e-07	0.00e+00	0.00e+00	2.43e-05
Sb-124	2.80e-06	5.29e-08	1.11e-06	6.79e-09	0.00e+00	2.18e-06	7.95e-05
Sb-125	1.79e-06	2.00e-08	4.26e-07	1.82e-09	0.00e+00	1.38e-06	1.97e-05
Sb-126	1.15e-06	2.34e-08	4.15e-07	7.04e-09	0.00e+00	7.05e-07	9.40e-05
Sb-127	2.58e-07	5.65e-09	9.90e-08	3.10e-09	0.00e+00	1.53e-07	5.90e-05
Te-125m	2.68e-06	9.71e-07	3.59e-07	8.06e-07	1.09e-05	0.00e+00	1.07e-05
Te-127	1.10e-07	3.95e-08	2.38e-08	8.15e-08	4.48e-07	0.00e+00	8.68e-06
Te-127m	6.77e-06	2.42e-06	8.25e-07	1.73e-06	2.75e-05	0.00e+00	2.27e-05
Te-129	3.14e-08	1.18e-08	7.65e-09	2.41e-08	1.32e-07	0.00e+00	2.37e-08
Te-129m	1.15e-05	4.29e-06	1.82e-06	3.95e-06	4.80e-05	0.00e+00	5.79e-05
Te-131	1.97e-08	8.23e-09	6.22e-09	1.62e-08	8.63e-08	0.00e+00	2.79e-09
Te-131m	1.73e-06	8.46e-07	7.05e-07	1.34e-06	8.57e-06	0.00e+00	8.40e-05
Te-132	2.52e-06	1.63e-06	1.53e-06	1.80e-06	1.57e-05	0.00e+00	7.71e-05
Te-133m	4.62e-08	2.70e-08	2.60e-08	3.91e-08	2.67e-07	0.00e+00	9.26e-09
Te-134	3.24e-08	2.12e-08	1.30e-08	2.83e-08	2.05e-07	0.00e+00	3.59e-11
I-129	3.27e-06	2.81e-06	9.21e-06	7.23e-03	6.04e-06	0.00e+00	4.44e-07
I-130	7.56e-07	2.23e-06	8.80e-07	1.89e-04	3.48e-06	0.00e+00	1.92e-06
I-131	4.16e-06	5.95e-06	3.41e-06	1.95e-03	1.02e-05	0.00e+00	1.57e-06
I-132	2.03e-07	5.43e-07	1.90e-07	1.90e-05	8.65e-07	0.00e+00	1.02e-07
I-133	1.42e-06	2.47e-06	7.53e-07	3.63e-04	4.31e-06	0.00e+00	2.22e-06
I-134	1.06e-07	2.88e-07	1.03e-07	4.99e-06	4.58e-07	0.00e+00	2.51e-10
I-135	4.43e-07	1.16e-06	4.28e-07	7.65e-05	1.86e-06	0.00e+00	1.31e-06
Cs-134	6.22e-05	1.48e-04	1.21e-04	0.00e+00	4.79e-05	1.59e-05	2.59e-06
Cs-134m	2.13e-08	4.48e-08	2.29e-08	0.00e+00	2.43e-08	3.83e-09	1.58e-08

Conversion factors are in units of mrem per pCi ingested.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Ingestion Dose Conversion factors for Adult age group by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Cs-135	1.95e-05	1.80e-05	7.99e-06	0.00e+00	6.81e-06	2.04e-06	4.21e-07
Cs-136	6.51e-06	2.57e-05	1.85e-05	0.00e+00	1.43e-05	1.96e-06	2.92e-06
Cs-137	7.97e-05	1.09e-04	7.14e-05	0.00e+00	3.70e-05	1.23e-05	2.11e-06
Cs-138	5.52e-08	1.09e-07	5.40e-08	0.00e+00	8.01e-08	7.91e-09	4.65e-13
Cs-139	3.41e-08	5.08e-08	1.85e-08	0.00e+00	4.07e-08	3.70e-09	1.10e-30
Ba-139	9.70e-08	6.91e-11	2.84e-09	0.00e+00	6.46e-11	3.92e-11	1.72e-07
Ba-140	2.03e-05	2.55e-08	1.33e-06	0.00e+00	8.67e-09	1.46e-08	4.18e-05
Ba-141	4.71e-08	3.56e-11	1.59e-09	0.00e+00	3.31e-11	2.02e-11	2.22e-17
Ba-142	2.13e-08	2.19e-11	1.34e-09	0.00e+00	1.85e-11	1.24e-11	3.00e-26
La-140	2.50e-09	1.26e-09	3.33e-10	0.00e+00	0.00e+00	0.00e+00	9.25e-05
La-141	3.19e-10	9.90e-11	1.62e-11	0.00e+00	0.00e+00	0.00e+00	1.18e-05
La-142	1.28e-10	5.82e-11	1.45e-11	0.00e+00	0.00e+00	0.00e+00	4.25e-07
Ce-141	9.36e-09	6.33e-09	7.18e-10	0.00e+00	2.94e-09	0.00e+00	2.42e-05
Ce-143	1.65e-09	1.22e-06	1.35e-10	0.00e+00	5.37e-10	0.00e+00	4.56e-05
Ce-144	4.88e-07	2.04e-07	2.62e-08	0.00e+00	1.21e-07	0.00e+00	1.65e-04
Pr-143	9.20e-09	3.69e-09	4.56e-10	0.00e+00	2.13e-09	0.00e+00	4.03e-05
Pr-144	3.01e-11	1.25e-11	1.53e-12	0.00e+00	7.05e-12	0.00e+00	4.33e-18
Nd-147	6.29e-09	7.27e-09	4.35e-10	0.00e+00	4.25e-09	0.00e+00	3.49e-05
Pm-147	7.54e-08	7.09e-09	2.87e-09	0.00e+00	1.34e-08	0.00e+00	8.93e-06
Pm-148	7.17e-09	1.19e-09	5.99e-10	0.00e+00	2.25e-09	0.00e+00	9.35e-05
Pm-148m	3.07e-08	7.95e-09	6.08e-09	0.00e+00	1.20e-08	0.00e+00	6.74e-05
Pm-149	1.52e-09	2.15e-10	8.78e-11	0.00e+00	4.06e-10	0.00e+00	4.03e-05
Pm-151	6.97e-10	1.17e-10	5.91e-11	0.00e+00	2.09e-10	0.00e+00	3.22e-05
Sm-151	6.90e-08	1.19e-08	2.85e-09	0.00e+00	1.33e-08	0.00e+00	5.25e-06
Sm-153	8.57e-10	7.15e-10	5.22e-11	0.00e+00	2.31e-10	0.00e+00	2.55e-05
Eu-152	1.95e-07	4.44e-08	3.90e-08	0.00e+00	2.75e-07	0.00e+00	2.56e-05
Eu-154	6.15e-07	7.56e-08	5.38e-08	0.00e+00	3.62e-07	0.00e+00	5.48e-05
Eu-155	8.60e-08	1.22e-08	7.87e-09	0.00e+00	5.63e-08	0.00e+00	9.60e-06
Eu-156	1.37e-08	1.06e-08	1.71e-09	0.00e+00	7.08e-09	0.00e+00	7.26e-05
Tb-160	4.70e-08	0.00e+00	5.86e-09	0.00e+00	1.94e-08	0.00e+00	4.33e-05

Conversion factors are in units of mrem per pCi ingested.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Ingestion Dose Conversion factors for Adult age group by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Ho-166m	2.70e-07	8.43e-08	6.40e-08	0.00e+00	1.26e-07	0.00e+00	2.56e-05
W-181	9.91e-09	3.23e-09	3.46e-10	0.00e+00	0.00e+00	0.00e+00	3.68e-07
W-185	4.05e-07	1.35e-07	1.42e-08	0.00e+00	0.00e+00	0.00e+00	1.56e-05
W-187	1.03e-07	8.61e-08	3.01e-08	0.00e+00	0.00e+00	0.00e+00	2.82e-05
Pb-210	1.53e-02	4.37e-03	5.44e-04	0.00e+00	1.23e-02	0.00e+00	2.24e-06
Bi-210	4.61e-07	3.18e-06	2.64e-07	0.00e+00	3.83e-05	0.00e+00	4.75e-05
Po-210	3.56e-04	7.56e-04	8.59e-05	0.00e+00	2.52e-03	0.00e+00	6.36e-05
Ra-223	4.97e-03	7.65e-06	9.94e-04	0.00e+00	2.17e-04	0.00e+00	3.21e-04
Ra-224	1.61e-03	3.90e-06	3.23e-04	0.00e+00	1.10e-04	0.00e+00	3.40e-04
Ra-225	6.56e-03	7.78e-06	1.31e-03	0.00e+00	2.21e-04	0.00e+00	3.06e-04
Ra-226	3.02e-01	5.74e-06	2.20e-01	0.00e+00	1.63e-04	0.00e+00	3.32e-04
Ra-228	1.12e-01	3.12e-06	1.21e-01	0.00e+00	8.83e-05	0.00e+00	5.64e-05
Ac-225	4.40e-06	6.06e-06	2.96e-07	0.00e+00	6.90e-07	0.00e+00	4.07e-04
Ac-227	1.87e-03	2.48e-04	1.11e-04	0.00e+00	8.00e-05	0.00e+00	8.19e-05
Th-227	1.37e-05	2.48e-07	3.95e-07	0.00e+00	1.41e-06	0.00e+00	5.40e-04
Th-228	4.96e-04	8.40e-06	1.68e-05	0.00e+00	4.67e-05	0.00e+00	5.63e-04
Th-229	1.36e-02	3.89e-04	2.25e-04	0.00e+00	1.88e-03	0.00e+00	7.81e-05
Th-230	2.06e-03	1.17e-04	5.70e-05	0.00e+00	5.65e-04	0.00e+00	6.02e-05
Th-232	2.30e-03	1.00e-04	1.50e-06	0.00e+00	4.82e-04	0.00e+00	5.12e-05
Th-234	8.01e-08	4.71e-09	2.31e-09	0.00e+00	2.67e-08	0.00e+00	1.13e-04
Pa-231	4.10e-03	1.54e-04	1.59e-04	0.00e+00	8.64e-04	0.00e+00	7.17e-05
Pa-233	5.26e-09	1.06e-09	9.12e-10	0.00e+00	3.99e-09	0.00e+00	1.64e-05
U-232	4.13e-03	0.00e+00	2.95e-04	0.00e+00	4.47e-04	0.00e+00	6.78e-05
U-233	8.71e-04	0.00e+00	5.28e-05	0.00e+00	2.03e-04	0.00e+00	6.27e-05
U-234	8.36e-04	0.00e+00	5.17e-05	0.00e+00	1.99e-04	0.00e+00	6.14e-05
U-235	8.01e-04	0.00e+00	4.86e-05	0.00e+00	1.87e-04	0.00e+00	7.81e-05
U-236	8.01e-04	0.00e+00	4.96e-05	0.00e+00	1.91e-04	0.00e+00	5.76e-05
U-237	5.52e-08	0.00e+00	1.47e-08	0.00e+00	2.27e-07	0.00e+00	1.94e-05
U-238	7.67e-04	0.00e+00	4.54e-05	0.00e+00	1.75e-04	0.00e+00	5.50e-05
Np-237	1.26e-03	8.96e-05	5.54e-05	0.00e+00	4.12e-04	0.00e+00	7.94e-05

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# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Ingestion Dose Conversion factors for Adult age group by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Np-238	1.37e-08	3.69e-10	2.13e-10	0.00e+00	1.25e-09	0.00e+00	3.43e-05
Np-239	1.19e-09	1.17e-10	6.45e-11	0.00e+00	3.65e-10	0.00e+00	2.40e-05
Pu-238	6.30e-04	7.98e-05	1.71e-05	0.00e+00	7.32e-05	0.00e+00	7.30e-05
Pu-239	7.25e-04	8.71e-05	1.91e-05	0.00e+00	8.11e-05	0.00e+00	6.66e-05
Pu-240	7.24e-04	8.70e-05	1.91e-05	0.00e+00	8.10e-05	0.00e+00	6.78e-05
Pu-241	1.57e-05	7.45e-07	3.32e-07	0.00e+00	1.53e-06	0.00e+00	1.40e-06
Pu-242	6.72e-04	8.39e-05	1.84e-05	0.00e+00	7.81e-05	0.00e+00	6.53e-05
Pu-244	7.84e-04	9.61e-05	2.11e-05	0.00e+00	8.95e-05	0.00e+00	9.73e-05
Am-241	7.55e-04	7.05e-04	5.41e-05	0.00e+00	4.07e-04	0.00e+00	7.42e-05
Am-242m	7.61e-04	6.63e-04	5.43e-05	0.00e+00	4.05e-04	0.00e+00	9.34e-05
Am-243	7.54e-04	6.90e-04	5.30e-05	0.00e+00	3.99e-04	0.00e+00	8.70e-05
Cm-242	2.06e-05	2.19e-05	1.37e-06	0.00e+00	6.22e-06	0.00e+00	7.92e-05
Cm-243	5.99e-04	5.49e-04	3.75e-05	0.00e+00	1.75e-04	0.00e+00	7.81e-05
Cm-244	4.56e-04	4.27e-04	2.87e-05	0.00e+00	1.34e-04	0.00e+00	7.55e-05
Cm-245	9.38e-04	8.17e-04	5.76e-05	0.00e+00	2.69e-04	0.00e+00	7.04e-05
Cm-246	9.30e-04	8.16e-04	5.75e-05	0.00e+00	2.68e-04	0.00e+00	6.91e-05
Cm-247	9.07e-04	8.04e-04	5.67e-05	0.00e+00	2.64e-04	0.00e+00	9.09e-05
Cm-248	7.54e-03	6.63e-03	4.67e-04	0.00e+00	2.18e-03	0.00e+00	1.47e-03
Cf-252	2.61e-04	0.00e+00	6.29e-06	0.00e+00	0.00e+00	0.00e+00	2.88e-04

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# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Ingestion Dose Conversion factors for Teen age group by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
H-3	0.00e+00	6.04e-08	6.04e-08	6.04e-08	6.04e-08	6.04e-08	6.04e-08
Be-10	4.48e-06	6.94e-07	1.13e-07	0.00e+00	5.30e-07	0.00e+00	2.84e-05
C-14	4.06e-06	8.12e-07	8.12e-07	8.12e-07	8.12e-07	8.12e-07	8.12e-07
N-13	1.15e-08	1.15e-08	1.15e-08	1.15e-08	1.15e-08	1.15e-08	1.15e-08
F-18	8.64e-07	0.00e+00	9.47e-08	0.00e+00	0.00e+00	0.00e+00	7.78e-08
Na-22	2.34e-05	2.34e-05	2.34e-05	2.34e-05	2.34e-05	2.34e-05	2.34e-05
Na-24	2.30e-06	2.30e-06	2.30e-06	2.30e-06	2.30e-06	2.30e-06	2.30e-06
P-32	2.76e-04	1.71e-05	1.07e-05	0.00e+00	0.00e+00	0.00e+00	2.32e-05
Ca-41	1.97e-04	0.00e+00	2.13e-05	0.00e+00	0.00e+00	0.00e+00	1.95e-07
Sc-46	7.24e-09	1.41e-08	4.18e-09	0.00e+00	1.35e-08	0.00e+00	4.80e-05
Cr-51	0.00e+00	0.00e+00	3.60e-09	2.00e-09	7.89e-10	5.14e-09	6.05e-07
Mn-54	0.00e+00	5.90e-06	1.17e-06	0.00e+00	1.76e-06	0.00e+00	1.21e-05
Mn-56	0.00e+00	1.58e-07	2.81e-08	0.00e+00	2.00e-07	0.00e+00	1.04e-05
Fe-55	3.78e-06	2.68e-06	6.25e-07	0.00e+00	0.00e+00	1.70e-06	1.16e-06
Fe-59	5.87e-06	1.37e-05	5.29e-06	0.00e+00	0.00e+00	4.32e-06	3.24e-05
Co-57	0.00e+00	2.38e-07	3.99e-07	0.00e+00	0.00e+00	0.00e+00	4.44e-06
Co-58	0.00e+00	9.72e-07	2.24e-06	0.00e+00	0.00e+00	0.00e+00	1.34e-05
Co-60	0.00e+00	2.81e-06	6.33e-06	0.00e+00	0.00e+00	0.00e+00	3.66e-05
Ni-59	1.32e-05	4.66e-06	2.24e-06	0.00e+00	0.00e+00	0.00e+00	7.31e-07
Ni-63	1.77e-04	1.25e-05	6.00e-06	0.00e+00	0.00e+00	0.00e+00	1.99e-06
Ni-65	7.49e-07	9.57e-08	4.36e-08	0.00e+00	0.00e+00	0.00e+00	5.19e-06
Cu-64	0.00e+00	1.15e-07	5.41e-08	0.00e+00	2.91e-07	0.00e+00	8.92e-06
Zn-65	5.76e-06	2.00e-05	9.33e-06	0.00e+00	1.28e-05	0.00e+00	8.47e-06
Zn-69	1.47e-08	2.80e-08	1.96e-09	0.00e+00	1.83e-08	0.00e+00	5.16e-08
Zn-69m	2.40e-07	5.66e-07	5.19e-08	0.00e+00	3.44e-07	0.00e+00	3.11e-05
Se-79	0.00e+00	3.73e-06	6.27e-07	0.00e+00	6.50e-06	0.00e+00	5.70e-07
Br-82	0.00e+00	0.00e+00	3.04e-06	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Br-83	0.00e+00	0.00e+00	5.74e-08	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Br-84	0.00e+00	0.00e+00	7.22e-08	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Br-85	0.00e+00	0.00e+00	3.05e-09	0.00e+00	0.00e+00	0.00e+00	0.00e+00

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Ingestion Dose Conversion factors for Teen age group by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Rb-86	0.00e+00	2.98e-05	1.40e-05	0.00e+00	0.00e+00	0.00e+00	4.41e-06
Rb-87	0.00e+00	1.75e-05	6.11e-06	0.00e+00	0.00e+00	0.00e+00	6.11e-07
Rb-88	0.00e+00	8.52e-08	4.54e-08	0.00e+00	0.00e+00	0.00e+00	7.30e-15
Rb-89	0.00e+00	5.50e-08	3.89e-08	0.00e+00	0.00e+00	0.00e+00	8.43e-17
Sr-89	4.40e-04	0.00e+00	1.26e-05	0.00e+00	0.00e+00	0.00e+00	5.24e-05
Sr-90	1.02e-02	0.00e+00	2.04e-04	0.00e+00	0.00e+00	0.00e+00	2.33e-04
Sr-91	8.07e-06	0.00e+00	3.21e-07	0.00e+00	0.00e+00	0.00e+00	3.66e-05
Sr-92	3.05e-06	0.00e+00	1.30e-07	0.00e+00	0.00e+00	0.00e+00	7.77e-05
Y-90	1.37e-08	0.00e+00	3.69e-10	0.00e+00	0.00e+00	0.00e+00	1.13e-04
Y-91	2.01e-07	0.00e+00	5.39e-09	0.00e+00	0.00e+00	0.00e+00	8.24e-05
Y-91m	1.29e-10	0.00e+00	4.93e-12	0.00e+00	0.00e+00	0.00e+00	6.09e-09
Y-92	1.21e-09	0.00e+00	3.50e-11	0.00e+00	0.00e+00	0.00e+00	3.32e-05
Y-93	3.83e-09	0.00e+00	1.05e-10	0.00e+00	0.00e+00	0.00e+00	1.17e-04
Zr-93	5.53e-08	2.73e-09	1.49e-09	0.00e+00	9.65e-09	0.00e+00	2.58e-06
Zr-95	4.12e-08	1.30e-08	8.94e-09	0.00e+00	1.91e-08	0.00e+00	3.00e-05
Zr-97	2.37e-09	4.69e-10	2.16e-10	0.00e+00	7.11e-10	0.00e+00	1.27e-04
Nb-93m	3.44e-08	1.13e-08	2.83e-09	0.00e+00	1.32e-08	0.00e+00	4.07e-06
Nb-95	8.22e-09	4.56e-09	2.51e-09	0.00e+00	4.42e-09	0.00e+00	1.95e-05
Nb-97	7.37e-11	1.83e-11	6.68e-12	0.00e+00	2.14e-11	0.00e+00	4.37e-07
Mo-93	0.00e+00	1.06e-05	2.90e-07	0.00e+00	3.04e-06	0.00e+00	1.29e-06
Mo-99	0.00e+00	6.03e-06	1.15e-06	0.00e+00	1.38e-05	0.00e+00	1.08e-05
Tc-101	3.60e-10	5.12e-10	5.03e-09	0.00e+00	9.26e-09	3.12e-10	8.75e-17
Tc-99	1.79e-07	2.63e-07	7.17e-08	0.00e+00	3.34e-06	2.72e-08	6.44e-06
Tc-99m	3.32e-10	9.26e-10	1.20e-08	0.00e+00	1.38e-08	5.14e-10	6.08e-07
Ru-103	2.55e-07	0.00e+00	1.09e-07	0.00e+00	8.99e-07	0.00e+00	2.13e-05
Ru-105	2.18e-08	0.00e+00	8.46e-09	0.00e+00	2.75e-07	0.00e+00	1.76e-05
Ru-106	3.92e-06	0.00e+00	4.94e-07	0.00e+00	7.56e-06	0.00e+00	1.88e-04
Rh-105	1.73e-07	1.25e-07	8.20e-08	0.00e+00	5.31e-07	0.00e+00	1.59e-05
Pd-107	0.00e+00	2.08e-07	1.34e-08	0.00e+00	1.88e-06	0.00e+00	9.66e-07
Pd-109	0.00e+00	2.51e-07	5.70e-08	0.00e+00	1.45e-06	0.00e+00	2.53e-05

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Ingestion Dose Conversion factors for Teen age group by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Ag-110m	2.05e-07	1.94e-07	1.18e-07	0.00e+00	3.70e-07	0.00e+00	5.45e-05
Ag-111	8.29e-08	3.44e-08	1.73e-08	0.00e+00	1.12e-07	0.00e+00	4.80e-05
Cd-113m	0.00e+00	4.51e-06	1.45e-07	0.00e+00	4.99e-06	0.00e+00	2.71e-05
Cd-115m	0.00e+00	2.60e-06	8.39e-08	0.00e+00	2.08e-06	0.00e+00	8.23e-05
Sn-123	4.44e-05	7.29e-07	1.08e-06	5.84e-07	0.00e+00	0.00e+00	6.71e-05
Sn-125	1.19e-05	2.37e-07	5.37e-07	1.86e-07	0.00e+00	0.00e+00	1.12e-04
Sn-126	1.16e-04	2.16e-06	3.30e-06	5.69e-07	0.00e+00	0.00e+00	2.58e-05
Sb-124	3.87e-06	7.13e-08	1.51e-06	8.78e-09	0.00e+00	3.38e-06	7.80e-05
Sb-125	2.48e-06	2.71e-08	5.80e-07	2.37e-09	0.00e+00	2.18e-06	1.93e-05
Sb-126	1.59e-06	3.25e-08	5.71e-07	8.99e-09	0.00e+00	1.14e-06	9.41e-05
Sb-127	3.63e-07	7.76e-09	1.37e-07	4.08e-09	0.00e+00	2.47e-07	6.16e-05
Te-125m	3.83e-06	1.38e-06	5.12e-07	1.07e-06	0.00e+00	0.00e+00	1.13e-05
Te-127	1.58e-07	5.60e-08	3.40e-08	1.09e-07	6.40e-07	0.00e+00	1.22e-05
Te-127m	9.67e-06	3.43e-06	1.15e-06	2.30e-06	3.92e-05	0.00e+00	2.41e-05
Te-129	4.48e-08	1.67e-08	1.09e-08	3.20e-08	1.88e-07	0.00e+00	2.45e-07
Te-129m	1.63e-05	6.05e-06	2.58e-06	5.26e-06	6.82e-05	0.00e+00	6.12e-05
Te-131	2.79e-08	1.15e-08	8.72e-09	2.15e-08	1.22e-07	0.00e+00	2.29e-09
Te-131m	2.44e-06	1.17e-06	9.76e-07	1.76e-06	1.22e-05	0.00e+00	9.39e-05
Te-132	3.49e-06	2.21e-06	2.08e-06	2.33e-06	2.12e-05	0.00e+00	7.00e-05
Te-133m	6.44e-08	3.66e-08	3.56e-08	5.11e-08	3.62e-07	0.00e+00	1.48e-07
Te-134	4.47e-08	2.87e-08	3.00e-08	3.67e-08	2.74e-07	0.00e+00	1.66e-09
I-129	4.66e-06	3.92e-06	6.54e-06	4.77e-03	7.01e-06	0.00e+00	4.57e-07
I-130	1.03e-06	2.98e-06	1.19e-06	2.43e-04	4.59e-06	0.00e+00	2.29e-06
I-131	5.85e-06	8.19e-06	4.40e-06	2.39e-03	1.41e-05	0.00e+00	1.62e-06
I-132	2.79e-07	7.30e-07	2.62e-07	2.46e-05	1.15e-06	0.00e+00	3.18e-07
I-133	2.01e-06	3.41e-06	1.04e-06	4.76e-04	5.98e-06	0.00e+00	2.58e-06
I-134	1.46e-07	3.87e-07	1.39e-07	6.45e-06	6.10e-07	0.00e+00	5.10e-09
I-135	6.10e-07	1.57e-06	5.82e-07	1.01e-04	2.48e-06	0.00e+00	1.74e-06
Cs-134	8.37e-05	1.97e-04	9.14e-05	0.00e+00	6.26e-05	2.39e-05	2.45e-06
Cs-134m	2.94e-08	6.09e-08	3.13e-08	0.00e+00	3.39e-08	5.95e-09	4.05e-08

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# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Ingestion Dose Conversion factors for Teen age group by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Cs-135	2.78e-05	2.55e-05	5.96e-06	0.00e+00	9.73e-06	3.52e-06	4.46e-07
Cs-136	8.59e-06	3.38e-05	2.27e-05	0.00e+00	1.84e-05	2.90e-06	2.72e-06
Cs-137	1.12e-04	1.49e-04	5.19e-05	0.00e+00	5.07e-05	1.97e-05	2.12e-06
Cs-138	7.76e-08	1.49e-07	7.45e-08	0.00e+00	1.10e-07	1.28e-08	6.76e-11
Cs-139	4.87e-08	7.17e-08	2.63e-08	0.00e+00	5.79e-08	6.34e-09	3.33e-23
Ba-139	1.39e-07	9.78e-11	4.05e-09	0.00e+00	9.22e-11	6.74e-11	1.24e-06
Ba-140	2.84e-05	3.48e-08	1.83e-06	0.00e+00	1.18e-08	2.34e-08	4.38e-05
Ba-141	6.71e-08	5.01e-11	2.24e-09	0.00e+00	4.65e-11	3.43e-11	1.43e-13
Ba-142	2.99e-08	2.99e-11	1.84e-09	0.00e+00	2.53e-11	1.99e-11	9.18e-20
La-140	3.48e-09	1.71e-09	4.55e-10	0.00e+00	0.00e+00	0.00e+00	9.82e-05
La-141	4.55e-10	1.40e-10	2.31e-11	0.00e+00	0.00e+00	0.00e+00	2.48e-05
La-142	1.79e-10	7.95e-11	1.98e-11	0.00e+00	0.00e+00	0.00e+00	2.42e-06
Ce-141	1.33e-08	8.88e-09	1.02e-09	0.00e+00	4.18e-09	0.00e+00	2.54e-05
Ce-143	2.35e-09	1.71e-06	1.91e-10	0.00e+00	7.67e-10	0.00e+00	5.14e-05
Ce-144	6.96e-07	2.88e-07	3.74e-08	0.00e+00	1.72e-07	0.00e+00	1.75e-04
Pr-143	1.31e-08	5.23e-09	6.52e-10	0.00e+00	3.04e-09	0.00e+00	4.31e-05
Pr-144	4.30e-11	1.76e-11	2.18e-12	0.00e+00	1.01e-11	0.00e+00	4.74e-14
Nd-147	9.38e-09	1.02e-08	6.11e-10	0.00e+00	5.99e-09	0.00e+00	3.68e-05
Pm-147	1.05e-07	9.96e-09	4.06e-09	0.00e+00	1.90e-08	0.00e+00	9.47e-06
Pm-148	1.02e-08	1.66e-09	8.36e-10	0.00e+00	3.00e-09	0.00e+00	9.90e-05
Pm-148m	4.14e-08	1.05e-08	8.21e-09	0.00e+00	1.59e-08	0.00e+00	6.61e-05
Pm-149	2.17e-09	3.05e-10	1.25e-10	0.00e+00	5.81e-10	0.00e+00	4.49e-05
Pm-151	9.87e-10	1.63e-10	8.25e-11	0.00e+00	2.93e-10	0.00e+00	3.66e-05
Sm-151	8.73e-08	1.68e-08	3.94e-09	0.00e+00	1.84e-08	0.00e+00	5.70e-06
Sm-153	1.22e-09	1.01e-09	7.43e-11	0.00e+00	3.30e-10	0.00e+00	2.85e-05
Eu-152	2.45e-07	5.90e-08	5.20e-08	0.00e+00	2.74e-07	0.00e+00	2.17e-05
Eu-154	7.91e-07	1.02e-07	7.19e-08	0.00e+00	4.56e-07	0.00e+00	5.39e-05
Eu-155	1.74e-07	1.68e-08	1.04e-08	0.00e+00	6.57e-08	0.00e+00	9.63e-05
Eu-156	1.92e-08	1.44e-08	2.35e-09	0.00e+00	9.69e-09	0.00e+00	7.36e-05
Tb-160	6.47e-08	0.00e+00	8.07e-09	0.00e+00	2.56e-08	0.00e+00	4.19e-05

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# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Ingestion Dose Conversion factors for Teen age group by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Ho-166m	3.57e-07	1.10e-07	7.96e-08	0.00e+00	1.61e-07	0.00e+00	2.71e-05
W-181	1.42e-08	4.58e-09	4.79e-10	0.00e+00	0.00e+00	0.00e+00	3.90e-07
W-185	5.79e-07	1.91e-07	2.02e-08	0.00e+00	0.00e+00	0.00e+00	1.65e-05
W-187	1.46e-07	1.19e-07	4.17e-08	0.00e+00	0.00e+00	0.00e+00	3.22e-05
Pb-210	1.81e-02	5.44e-03	7.01e-04	0.00e+00	1.72e-02	0.00e+00	2.37e-06
Bi-210	6.59e-07	4.51e-06	3.77e-07	0.00e+00	5.48e-05	0.00e+00	5.15e-05
Po-210	5.09e-04	1.07e-03	1.23e-04	0.00e+00	3.60e-03	0.00e+00	6.75e-05
Ra-223	7.11e-03	1.08e-05	1.42e-03	0.00e+00	3.10e-04	0.00e+00	3.43e-04
Ra-224	2.31e-03	5.52e-06	4.61e-04	0.00e+00	1.58e-04	0.00e+00	3.71e-04
Ra-225	9.37e-03	1.10e-05	1.87e-03	0.00e+00	3.15e-04	0.00e+00	3.27e-04
Ra-226	3.22e-01	8.13e-06	2.39e-01	0.00e+00	2.32e-04	0.00e+00	3.51e-04
Ra-228	1.37e-01	4.41e-06	1.51e-01	0.00e+00	1.26e-04	0.00e+00	5.98e-05
Ac-225	6.29e-06	8.59e-06	4.22e-07	0.00e+00	9.85e-07	0.00e+00	4.36e-04
Ac-227	2.05e-03	3.03e-04	1.22e-04	0.00e+00	8.81e-05	0.00e+00	8.68e-05
Th-227	1.96e-05	3.52e-07	5.65e-07	0.00e+00	2.01e-06	0.00e+00	5.75e-04
Th-228	6.80e-04	1.14e-05	2.30e-05	0.00e+00	6.41e-05	0.00e+00	5.97e-04
Th-229	1.43e-02	4.11e-04	2.37e-04	0.00e+00	1.99e-03	0.00e+00	8.28e-05
Th-230	2.16e-03	1.23e-04	6.00e-05	0.00e+00	5.99e-04	0.00e+00	6.38e-05
Th-232	2.42e-03	1.05e-04	1.63e-06	0.00e+00	5.11e-04	0.00e+00	5.43e-05
Th-234	1.14e-07	6.68e-09	3.31e-09	0.00e+00	3.81e-08	0.00e+00	1.21e-04
Pa-231	4.31e-03	1.62e-04	1.68e-04	0.00e+00	9.10e-04	0.00e+00	7.60e-05
Pa-233	7.33e-09	1.41e-09	1.26e-09	0.00e+00	5.32e-09	0.00e+00	1.61e-05
U-232	5.89e-03	0.00e+00	4.21e-04	0.00e+00	6.38e-04	0.00e+00	7.19e-05
U-233	1.24e-03	0.00e+00	7.54e-05	0.00e+00	2.90e-04	0.00e+00	6.65e-05
U-234	1.19e-03	0.00e+00	7.39e-05	0.00e+00	2.85e-04	0.00e+00	6.51e-05
U-235	1.14e-03	0.00e+00	6.94e-05	0.00e+00	2.67e-04	0.00e+00	8.28e-05
U-236	1.14e-03	0.00e+00	7.09e-05	0.00e+00	2.73e-04	0.00e+00	6.11e-05
U-237	7.89e-08	0.00e+00	2.10e-08	0.00e+00	3.24e-07	0.00e+00	2.09e-05
U-238	1.09e-03	0.00e+00	6.49e-05	0.00e+00	2.50e-04	0.00e+00	5.83e-05
Np-237	1.33e-03	9.55e-05	5.85e-05	0.00e+00	4.33e-04	0.00e+00	8.41e-05

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# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Ingestion Dose Conversion factors for Teen age group by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Np-238	1.95e-08	5.22e-10	3.04e-10	0.00e+00	1.79e-09	0.00e+00	3.83e-05
Np-239	1.76e-09	1.66e-10	9.22e-11	0.00e+00	5.21e-10	0.00e+00	2.67e-05
Pu-238	6.70e-04	8.58e-05	1.82e-05	0.00e+00	7.80e-05	0.00e+00	7.73e-05
Pu-239	7.65e-04	9.29e-05	2.01e-05	0.00e+00	8.57e-05	0.00e+00	7.06e-05
Pu-240	7.64e-04	9.27e-05	2.01e-05	0.00e+00	8.56e-05	0.00e+00	7.19e-05
Pu-241	1.75e-05	8.40e-07	3.69e-07	0.00e+00	1.71e-06	0.00e+00	1.48e-06
Pu-242	7.09e-04	8.94e-05	1.94e-05	0.00e+00	8.25e-05	0.00e+00	6.92e-05
Pu-244	8.28e-04	1.02e-04	2.22e-05	0.00e+00	9.45e-05	0.00e+00	1.03e-04
Am-241	7.98e-04	7.53e-04	5.75e-05	0.00e+00	4.31e-04	0.00e+00	7.87e-05
Am-242m	8.07e-04	7.11e-04	5.80e-05	0.00e+00	4.30e-04	0.00e+00	9.90e-05
Am-243	7.96e-04	7.35e-04	5.62e-05	0.00e+00	4.22e-04	0.00e+00	9.23e-05
Cm-242	2.94e-05	3.10e-05	1.95e-06	0.00e+00	8.89e-06	0.00e+00	8.40e-05
Cm-243	6.50e-04	6.03e-04	4.09e-05	0.00e+00	1.91e-04	0.00e+00	8.28e-05
Cm-244	5.04e-04	4.77e-04	3.19e-05	0.00e+00	1.49e-04	0.00e+00	8.00e-05
Cm-245	9.90e-04	8.71e-04	6.10e-05	0.00e+00	2.85e-04	0.00e+00	7.46e-05
Cm-246	9.82e-04	8.70e-04	6.09e-05	0.00e+00	2.84e-04	0.00e+00	7.33e-05
Cm-247	9.57e-04	8.57e-04	6.00e-05	0.00e+00	2.80e-04	0.00e+00	9.63e-05
Cm-248	7.95e-03	7.06e-03	4.95e-04	0.00e+00	2.31e-03	0.00e+00	1.55e-03
Cf-252	3.47e-04	0.00e+00	8.37e-06	0.00e+00	0.00e+00	0.00e+00	3.05e-04

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Ingestion Dose Conversion factors for Child age group by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
H-3	0.00e+00	1.16e-07	1.16e-07	1.16e-07	1.16e-07	1.16e-07	1.16e-07
Be-10	1.35e-05	1.57e-06	3.39e-07	0.00e+00	1.11e-06	0.00e+00	2.75e-05
C-14	1.21e-05	2.42e-06	2.42e-06	2.42e-06	2.42e-06	2.42e-06	2.42e-06
N-13	3.10e-08	3.10e-08	3.10e-08	3.10e-08	3.10e-08	3.10e-08	3.10e-08
F-18	2.49e-06	0.00e+00	2.47e-07	0.00e+00	0.00e+00	0.00e+00	6.74e-07
Na-22	5.88e-05	5.88e-05	5.88e-05	5.88e-05	5.88e-05	5.88e-05	5.88e-05
Na-24	5.80e-06	5.80e-06	5.80e-06	5.80e-06	5.80e-06	5.80e-06	5.80e-06
P-32	8.25e-04	3.86e-05	3.18e-05	0.00e+00	0.00e+00	0.00e+00	2.28e-05
Ca-41	3.47e-04	0.00e+00	3.79e-05	0.00e+00	0.00e+00	0.00e+00	1.90e-07
Sc-46	1.97e-08	2.70e-08	1.04e-08	0.00e+00	2.39e-08	0.00e+00	3.95e-05
Cr-51	0.00e+00	0.00e+00	8.90e-09	4.94e-09	1.35e-09	9.02e-09	4.72e-07
Mn-54	0.00e+00	1.07e-05	2.85e-06	0.00e+00	3.00e-06	0.00e+00	8.98e-06
Mn-56	0.00e+00	3.34e-07	7.54e-08	0.00e+00	4.04e-07	0.00e+00	4.84e-05
Fe-55	1.15e-05	6.10e-06	1.89e-06	0.00e+00	0.00e+00	3.45e-06	1.13e-06
Fe-59	1.65e-05	2.67e-05	1.33e-05	0.00e+00	0.00e+00	7.74e-06	2.78e-05
Co-57	0.00e+00	4.93e-07	9.98e-07	0.00e+00	0.00e+00	0.00e+00	4.04e-06
Co-58	0.00e+00	1.80e-06	5.51e-06	0.00e+00	0.00e+00	0.00e+00	1.05e-05
Co-60	0.00e+00	5.29e-06	1.56e-05	0.00e+00	0.00e+00	0.00e+00	2.93e-05
Ni-59	4.02e-05	1.07e-05	6.82e-06	0.00e+00	0.00e+00	0.00e+00	7.10e-07
Ni-63	5.38e-04	2.88e-05	1.83e-05	0.00e+00	0.00e+00	0.00e+00	1.94e-06
Ni-65	2.22e-06	2.09e-07	1.22e-07	0.00e+00	0.00e+00	0.00e+00	2.56e-05
Cu-64	0.00e+00	2.45e-07	1.48e-07	0.00e+00	5.92e-07	0.00e+00	1.15e-05
Zn-65	1.37e-05	3.65e-05	2.27e-05	0.00e+00	2.30e-05	0.00e+00	6.41e-06
Zn-69	4.38e-08	6.33e-08	5.85e-09	0.00e+00	3.84e-08	0.00e+00	3.99e-06
Zn-69m	7.10e-07	1.21e-06	1.43e-07	0.00e+00	7.03e-07	0.00e+00	3.94e-05
Se-79	0.00e+00	8.43e-06	1.87e-06	0.00e+00	1.37e-05	0.00e+00	5.53e-07
Br-82	0.00e+00	0.00e+00	7.55e-06	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Br-83	0.00e+00	0.00e+00	1.71e-07	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Br-84	0.00e+00	0.00e+00	1.98e-07	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Br-85	0.00e+00	0.00e+00	9.12e-09	0.00e+00	0.00e+00	0.00e+00	0.00e+00

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Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Rb-86	0.00e+00	6.70e-05	4.12e-05	0.00e+00	0.00e+00	0.00e+00	4.31e-06
Rb-87	0.00e+00	3.95e-05	1.83e-05	0.00e+00	0.00e+00	0.00e+00	5.92e-07
Rb-88	0.00e+00	1.90e-07	1.32e-07	0.00e+00	0.00e+00	0.00e+00	9.32e-09
Rb-89	0.00e+00	1.17e-07	1.04e-07	0.00e+00	0.00e+00	0.00e+00	1.02e-09
Sr-89	1.32e-03	0.00e+00	3.77e-05	0.00e+00	0.00e+00	0.00e+00	5.11e-05
Sr-90	2.56e-02	0.00e+00	5.15e-04	0.00e+00	0.00e+00	0.00e+00	2.29e-04
Sr-91	2.40e-05	0.00e+00	9.06e-07	0.00e+00	0.00e+00	0.00e+00	5.30e-05
Sr-92	9.03e-06	0.00e+00	3.62e-07	0.00e+00	0.00e+00	0.00e+00	1.71e-04
Y-90	4.11e-08	0.00e+00	1.10e-09	0.00e+00	0.00e+00	0.00e+00	1.17e-04
Y-91	6.02e-07	0.00e+00	1.61e-08	0.00e+00	0.00e+00	0.00e+00	8.02e-05
Y-91m	3.82e-10	0.00e+00	1.39e-11	0.00e+00	0.00e+00	0.00e+00	7.48e-07
Y-92	3.60e-09	0.00e+00	1.03e-10	0.00e+00	0.00e+00	0.00e+00	1.04e-04
Y-93	1.14e-08	0.00e+00	3.13e-10	0.00e+00	0.00e+00	0.00e+00	1.70e-04
Zr-93	1.67e-07	6.25e-09	4.45e-09	0.00e+00	2.42e-08	0.00e+00	2.37e-06
Zr-95	1.16e-07	2.55e-08	2.27e-08	0.00e+00	3.65e-08	0.00e+00	2.66e-05
Zr-97	6.99e-09	1.01e-09	5.96e-10	0.00e+00	1.45e-09	0.00e+00	1.53e-04
Nb-93m	1.05e-07	2.62e-08	8.61e-09	0.00e+00	2.83e-08	0.00e+00	3.95e-06
Nb-95	2.25e-08	8.76e-09	6.26e-09	0.00e+00	8.23e-09	0.00e+00	1.62e-05
Nb-97	2.17e-10	3.92e-11	1.83e-11	0.00e+00	4.35e-11	0.00e+00	1.21e-05
Mo-93	0.00e+00	2.41e-05	8.65e-07	0.00e+00	6.35e-06	0.00e+00	1.22e-06
Mo-99	0.00e+00	1.33e-05	3.29e-06	0.00e+00	2.84e-05	0.00e+00	1.10e-05
Tc-101	1.07e-09	1.12e-09	1.42e-08	0.00e+00	1.91e-08	5.92e-10	3.56e-09
Tc-99	5.35e-07	5.96e-07	2.14e-07	0.00e+00	7.02e-06	5.27e-08	6.25e-06
Tc-99m	9.23e-10	1.81e-09	3.00e-08	0.00e+00	2.63e-08	9.19e-10	1.03e-06
Ru-103	7.31e-07	0.00e+00	2.81e-07	0.00e+00	1.84e-06	0.00e+00	1.89e-05
Ru-105	6.45e-08	0.00e+00	2.34e-08	0.00e+00	5.67e-07	0.00e+00	4.21e-05
Ru-106	1.17e-05	0.00e+00	1.46e-06	0.00e+00	1.58e-05	0.00e+00	1.82e-04
Rh-105	5.14e-07	2.76e-07	2.36e-07	0.00e+00	1.10e-06	0.00e+00	1.71e-05
Pd-107	0.00e+00	4.72e-07	4.01e-08	0.00e+00	3.95e-06	0.00e+00	9.37e-07
Pd-109	0.00e+00	5.67e-07	1.70e-07	0.00e+00	3.04e-06	0.00e+00	3.35e-05

Conversion factors are in units of mrem per pCi ingested.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Ingestion Dose Conversion factors for Child age group by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Ag-110m	5.39e-07	3.64e-07	2.91e-07	0.00e+00	6.78e-07	0.00e+00	4.33e-05
Ag-111	2.48e-07	7.76e-08	5.12e-08	0.00e+00	2.34e-07	0.00e+00	4.75e-05
Cd-113m	0.00e+00	1.02e-05	4.34e-07	0.00e+00	1.05e-05	0.00e+00	2.63e-05
Cd-115m	0.00e+00	5.89e-06	2.51e-07	0.00e+00	4.38e-06	0.00e+00	8.01e-05
Sn-123	1.33e-04	1.65e-06	3.24e-06	1.75e-06	0.00e+00	0.00e+00	6.52e-05
Sn-125	3.55e-05	5.35e-07	1.59e-06	5.55e-07	0.00e+00	0.00e+00	1.10e-04
Sn-126	3.33e-04	4.15e-06	9.46e-06	1.14e-06	0.00e+00	0.00e+00	2.50e-05
Sb-124	1.11e-05	1.44e-07	3.89e-06	2.45e-08	0.00e+00	6.16e-06	6.94e-05
Sb-125	7.16e-06	5.52e-08	1.50e-06	6.63e-09	0.00e+00	3.99e-06	1.71e-05
Sb-126	4.40e-06	6.73e-08	1.58e-06	2.58e-08	0.00e+00	2.10e-06	8.87e-05
Sb-127	1.06e-06	1.64e-08	3.68e-07	1.18e-08	0.00e+00	4.60e-07	5.97e-05
Te-125m	1.14e-05	3.09e-06	1.52e-06	3.20e-06	0.00e+00	0.00e+00	1.10e-05
Te-127	4.71e-07	1.27e-07	1.01e-07	3.26e-07	1.34e-06	0.00e+00	1.84e-05
Te-127m	2.89e-05	7.78e-06	3.43e-06	6.91e-06	8.24e-05	0.00e+00	2.34e-05
Te-129	1.34e-07	3.74e-08	3.18e-08	9.56e-08	3.92e-07	0.00e+00	8.34e-06
Te-129m	4.87e-05	1.36e-05	7.56e-06	1.57e-05	1.43e-04	0.00e+00	5.94e-05
Te-131	8.30e-08	2.53e-08	2.47e-08	6.35e-08	2.51e-07	0.00e+00	4.36e-07
Te-131m	7.20e-06	2.49e-06	2.65e-06	5.12e-06	2.41e-05	0.00e+00	1.01e-04
Te-132	1.01e-05	4.47e-06	5.40e-06	6.51e-06	4.15e-05	0.00e+00	4.50e-05
Te-133m	1.87e-07	7.56e-08	9.37e-08	1.45e-07	7.18e-07	0.00e+00	5.77e-06
Te-134	1.29e-07	5.80e-08	7.74e-08	1.02e-07	5.37e-07	0.00e+00	5.89e-07
I-129	1.39e-05	8.53e-06	7.62e-06	5.58e-03	1.44e-05	0.00e+00	4.29e-07
I-130	2.92e-06	5.90e-06	3.04e-06	6.50e-04	8.82e-06	0.00e+00	2.76e-06
I-131	1.72e-05	1.73e-05	9.83e-06	5.72e-03	2.84e-05	0.00e+00	1.54e-06
I-132	8.00e-07	1.47e-06	6.76e-07	6.82e-05	2.25e-06	0.00e+00	1.73e-06
I-133	5.92e-06	7.32e-06	2.77e-06	1.36e-03	1.22e-05	0.00e+00	2.95e-06
I-134	4.19e-07	7.78e-07	3.58e-07	1.79e-05	1.19e-06	0.00e+00	5.16e-07
I-135	1.75e-06	3.15e-06	1.49e-06	2.79e-04	4.83e-06	0.00e+00	2.40e-06
Cs-134	2.34e-04	3.84e-04	8.10e-05	0.00e+00	1.19e-04	4.27e-05	2.07e-06
Cs-134m	8.44e-08	1.25e-07	8.16e-08	0.00e+00	6.59e-08	1.09e-08	1.58e-07

Conversion factors are in units of mrem per pCi ingested.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Ingestion Dose Conversion factors for Child age group by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Cs-135	8.30e-05	5.78e-05	5.93e-06	0.00e+00	2.04e-05	6.81e-06	4.33e-07
Cs-136	2.35e-05	6.46e-05	4.18e-05	0.00e+00	3.44e-05	5.13e-06	2.27e-06
Cs-137	3.27e-04	3.13e-04	4.62e-05	0.00e+00	1.02e-04	3.67e-05	1.96e-06
Cs-138	2.28e-07	3.17e-07	2.01e-07	0.00e+00	2.23e-07	2.40e-08	1.46e-07
Cs-139	1.45e-07	1.61e-07	7.74e-08	0.00e+00	1.21e-07	1.22e-08	1.45e-11
Ba-139	4.14e-07	2.21e-10	1.20e-08	0.00e+00	1.93e-10	1.30e-10	2.39e-05
Ba-140	8.31e-05	7.28e-08	4.85e-06	0.00e+00	2.37e-08	4.34e-08	4.21e-05
Ba-141	2.00e-07	1.12e-10	6.51e-09	0.00e+00	9.69e-11	6.58e-10	1.14e-07
Ba-142	8.74e-08	6.29e-11	4.88e-09	0.00e+00	5.09e-11	3.70e-11	1.14e-09
La-140	1.01e-08	3.53e-09	1.19e-09	0.00e+00	0.00e+00	0.00e+00	9.84e-05
La-141	1.36e-09	3.17e-10	6.88e-11	0.00e+00	0.00e+00	0.00e+00	7.05e-05
La-142	5.24e-10	1.67e-10	5.23e-11	0.00e+00	0.00e+00	0.00e+00	3.31e-05
Ce-141	3.97e-08	1.98e-08	2.94e-09	0.00e+00	8.68e-09	0.00e+00	2.47e-05
Ce-143	6.99e-09	3.79e-06	5.49e-10	0.00e+00	1.59e-09	0.00e+00	5.55e-05
Ce-144	2.08e-06	6.52e-07	1.11e-07	0.00e+00	3.61e-07	0.00e+00	1.70e-04
Pr-143	3.93e-08	1.18e-08	1.95e-09	0.00e+00	6.39e-09	0.00e+00	4.24e-05
Pr-144	1.29e-10	3.99e-11	6.49e-12	0.00e+00	2.11e-11	0.00e+00	8.59e-08
Nd-147	2.79e-08	2.26e-08	1.75e-09	0.00e+00	1.24e-08	0.00e+00	3.58e-05
Pm-147	3.18e-07	2.27e-08	1.22e-08	0.00e+00	4.01e-08	0.00e+00	9.19e-06
Pm-148	3.02e-08	3.63e-09	2.35e-09	0.00e+00	6.17e-09	0.00e+00	9.70e-05
Pm-148m	1.03e-07	2.05e-08	2.05e-08	0.00e+00	3.04e-08	0.00e+00	5.78e-05
Pm-149	6.49e-09	6.90e-10	3.74e-10	0.00e+00	1.22e-09	0.00e+00	4.71e-05
Pm-151	2.92e-09	3.55e-10	2.31e-10	0.00e+00	6.02e-10	0.00e+00	4.03e-05
Sm-151	2.56e-07	3.81e-08	1.20e-08	0.00e+00	3.94e-08	0.00e+00	5.53e-06
Sm-153	3.65e-09	2.27e-09	2.19e-10	0.00e+00	6.91e-10	0.00e+00	3.02e-05
Eu-152	6.15e-07	1.12e-07	1.33e-07	0.00e+00	4.73e-07	0.00e+00	1.84e-05
Eu-154	2.30e-06	2.07e-07	1.89e-07	0.00e+00	9.09e-07	0.00e+00	4.81e-05
Eu-155	4.82e-07	3.47e-08	2.72e-08	0.00e+00	1.30e-07	0.00e+00	8.69e-05
Eu-156	5.62e-08	3.01e-08	6.23e-09	0.00e+00	1.94e-08	0.00e+00	6.83e-05
Tb-160	1.66e-07	0.00e+00	2.06e-08	0.00e+00	4.94e-08	0.00e+00	3.68e-05

Conversion factors are in units of mrem per pCi ingested.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Ingestion Dose Conversion factors for Child age group by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Ho-166m	1.08e-06	2.26e-07	1.91e-07	0.00e+00	3.22e-07	0.00e+00	2.63e-05
W-181	4.23e-08	1.04e-08	1.43e-09	0.00e+00	0.00e+00	0.00e+00	3.79e-07
W-185	1.73e-06	4.32e-07	6.05e-08	0.00e+00	0.00e+00	0.00e+00	1.61e-05
W-187	4.29e-07	2.54e-07	1.14e-07	0.00e+00	0.00e+00	0.00e+00	3.57e-05
Pb-210	4.75e-02	1.22e-02	2.09e-03	0.00e+00	3.67e-02	0.00e+00	2.30e-06
Bi-210	1.97e-06	1.02e-05	1.13e-06	0.00e+00	1.15e-04	0.00e+00	5.17e-05
Po-210	1.52e-03	2.43e-03	3.67e-04	0.00e+00	7.56e-03	0.00e+00	6.55e-05
Ra-223	2.12e-02	2.45e-05	4.24e-03	0.00e+00	6.50e-04	0.00e+00	3.38e-04
Ra-224	6.89e-03	1.25e-05	1.38e-03	0.00e+00	3.31e-04	0.00e+00	3.78e-04
Ra-225	2.80e-02	2.50e-05	5.59e-03	0.00e+00	6.62e-04	0.00e+00	3.21e-04
Ra-226	5.75e-01	1.84e-05	4.72e-01	0.00e+00	4.88e-04	0.00e+00	3.41e-04
Ra-228	3.85e-01	9.99e-06	4.32e-01	0.00e+00	2.65e-04	0.00e+00	5.81e-05
Ac-225	1.88e-05	1.94e-05	1.26e-06	0.00e+00	2.07e-06	0.00e+00	4.31e-04
Ac-227	4.12e-03	6.63e-04	2.55e-04	0.00e+00	1.46e-04	0.00e+00	8.43e-05
Th-227	5.85e-05	7.96e-07	1.69e-06	0.00e+00	4.22e-06	0.00e+00	5.63e-04
Th-228	2.07e-03	2.65e-05	7.00e-05	0.00e+00	1.38e-04	0.00e+00	5.79e-04
Th-229	2.35e-02	5.91e-04	3.92e-04	0.00e+00	2.89e-03	0.00e+00	8.04e-05
Th-230	3.55e-03	1.78e-04	9.91e-05	0.00e+00	8.67e-04	0.00e+00	6.19e-05
Th-232	3.96e-03	1.52e-04	3.01e-06	0.00e+00	7.41e-04	0.00e+00	5.27e-05
Th-234	3.42e-07	1.51e-08	9.88e-09	0.00e+00	8.01e-08	0.00e+00	1.18e-04
Pa-231	7.07e-03	2.34e-04	2.81e-04	0.00e+00	1.28e-03	0.00e+00	7.37e-05
Pa-233	1.81e-08	2.82e-09	3.16e-09	0.00e+00	1.04e-08	0.00e+00	1.44e-05
U-232	1.76e-02	0.00e+00	1.26e-03	0.00e+00	1.34e-03	0.00e+00	6.98e-05
U-233	3.72e-03	0.00e+00	2.25e-04	0.00e+00	6.10e-04	0.00e+00	6.45e-05
U-234	3.57e-03	0.00e+00	2.21e-04	0.00e+00	5.98e-04	0.00e+00	6.32e-05
U-235	3.42e-03	0.00e+00	2.07e-04	0.00e+00	5.61e-04	0.00e+00	8.03e-05
U-236	3.42e-03	0.00e+00	2.12e-04	0.00e+00	5.73e-04	0.00e+00	5.92e-05
U-237	2.36e-07	0.00e+00	6.27e-08	0.00e+00	6.81e-07	0.00e+00	2.08e-05
U-238	3.27e-03	0.00e+00	1.94e-04	0.00e+00	5.24e-04	0.00e+00	5.66e-05
Np-237	2.23e-03	1.47e-04	9.79e-05	0.00e+00	6.05e-04	0.00e+00	8.16e-05

Conversion factors are in units of mrem per pCi ingested.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Ingestion Dose Conversion factors for Child age group by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Np-238	5.83e-08	1.18e-09	9.08e-10	0.00e+00	3.76e-09	0.00e+00	4.04e-05
Np-239	5.25e-09	3.77e-10	2.65e-10	0.00e+00	1.09e-09	0.00e+00	2.79e-05
Pu-238	1.19e-03	1.38e-04	3.16e-05	0.00e+00	1.15e-04	0.00e+00	7.50e-05
Pu-239	1.29e-03	1.38e-04	3.31e-05	0.00e+00	1.22e-04	0.00e+00	6.85e-05
Pu-240	1.28e-03	1.43e-04	3.31e-05	0.00e+00	1.22e-04	0.00e+00	6.98e-05
Pu-241	3.87e-05	1.58e-06	8.04e-07	0.00e+00	2.96e-06	0.00e+00	1.44e-06
Pu-242	1.19e-03	1.38e-04	3.19e-05	0.00e+00	1.17e-04	0.00e+00	6.71e-05
Pu-244	1.39e-03	1.58e-03	3.65e-05	0.00e+00	1.35e-04	0.00e+00	1.00e-04
Am-241	1.36e-03	1.17e-03	1.02e-04	0.00e+00	6.23e-04	0.00e+00	7.64e-05
Am-242m	1.40e-03	1.12e-03	1.04e-04	0.00e+00	6.30e-04	0.00e+00	9.61e-05
Am-243	1.34e-03	1.13e-03	9.83e-05	0.00e+00	6.06e-04	0.00e+00	8.95e-05
Cm-242	8.78e-05	7.01e-05	5.84e-06	0.00e+00	1.87e-05	0.00e+00	8.16e-05
Cm-243	1.28e-03	1.04e-03	8.24e-05	0.00e+00	3.08e-04	0.00e+00	8.03e-05
Cm-244	1.08e-03	8.74e-04	6.93e-05	0.00e+00	2.54e-04	0.00e+00	7.77e-05
Cm-245	1.67e-03	1.34e-03	1.05e-04	0.00e+00	4.11e-04	0.00e+00	7.24e-05
Cm-246	1.65e-03	1.34e-03	1.05e-04	0.00e+00	4.10e-04	0.00e+00	7.11e-05
Cm-247	1.61e-03	1.32e-03	1.03e-04	0.00e+00	4.04e-04	0.00e+00	9.35e-05
Cm-248	1.34e-02	1.09e-02	8.52e-04	0.00e+00	3.33e-03	0.00e+00	1.51e-03
Cf-252	1.05e-03	0.00e+00	2.54e-05	0.00e+00	0.00e+00	0.00e+00	2.96e-04

Conversion factors are in units of mrem per pCi ingested.

# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Ingestion Dose Conversion factors for Infant age group by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
H-3	0.00e+00	1.76e-07	1.76e-07	1.76e-07	1.76e-07	1.76e-07	1.76e-07
Be-10	1.71e-05	2.49e-06	5.16e-07	0.00e+00	1.64e-06	0.00e+00	2.78e-05
C-14	2.37e-05	5.06e-06	5.06e-06	5.06e-06	5.06e-06	5.06e-06	5.06e-06
N-13	5.85e-08	5.85e-08	5.85e-08	5.85e-08	5.85e-08	5.85e-08	5.85e-08
P-18	5.19e-06	0.00e+00	4.43e-07	0.00e+00	0.00e+00	0.00e+00	1.22e-06
Na-22	9.83e-05	9.83e-05	9.83e-05	9.83e-05	9.83e-05	9.83e-05	9.83e-05
Na-24	1.01e-05	1.01e-05	1.01e-05	1.01e-05	1.01e-05	1.01e-05	1.01e-05
P-32	1.70e-03	1.00e-04	6.59e-05	0.00e+00	0.00e+00	0.00e+00	2.30e-05
Ca-41	3.74e-04	0.00e+00	4.08e-05	0.00e+00	0.00e+00	0.00e+00	1.91e-07
Sc-46	3.75e-08	5.41e-08	1.69e-08	0.00e+00	3.56e-08	0.00e+00	3.53e-05
Cr-51	0.00e+00	0.00e+00	1.41e-08	9.20e-09	2.01e-09	1.79e-08	4.11e-07
Mn-54	0.00e+00	1.99e-05	4.51e-06	0.00e+00	4.41e-06	0.00e+00	7.31e-06
Mn-56	0.00e+00	8.18e-07	1.41e-07	0.00e+00	7.03e-07	0.00e+00	7.43e-05
Fe-55	1.39e-05	8.98e-06	2.40e-06	0.00e+00	0.00e+00	4.39e-06	1.14e-06
Fe-59	3.08e-05	5.38e-05	2.12e-05	0.00e+00	0.00e+00	1.59e-05	2.57e-05
Co-57	0.00e+00	1.15e-06	1.87e-06	0.00e+00	0.00e+00	0.00e+00	3.92e-06
Co-58	0.00e+00	3.60e-06	8.98e-06	0.00e+00	0.00e+00	0.00e+00	8.97e-06
Co-60	0.00e+00	1.08e-05	2.55e-05	0.00e+00	0.00e+00	0.00e+00	2.57e-05
Ni-59	4.73e-05	1.45e-05	8.17e-06	0.00e+00	0.00e+00	0.00e+00	7.16e-07
Ni-63	6.34e-04	3.92e-05	2.20e-05	0.00e+00	0.00e+00	0.00e+00	1.95e-06
Ni-65	4.70e-06	5.32e-07	2.42e-07	0.00e+00	0.00e+00	0.00e+00	4.05e-05
Cu-64	0.00e+00	6.09e-07	2.82e-07	0.00e+00	1.03e-06	0.00e+00	1.25e-05
Zn-65	1.84e-05	6.31e-05	2.91e-05	0.00e+00	3.06e-05	0.00e+00	5.33e-05
Zn-69	9.33e-08	1.68e-07	1.25e-08	0.00e+00	6.98e-08	0.00e+00	1.37e-05
Zn-69m	1.50e-06	3.06e-06	2.79e-07	0.00e+00	1.24e-06	0.00e+00	4.24e-05
Se-79	0.00e+00	2.10e-05	3.90e-06	0.00e+00	2.43e-05	0.00e+00	5.58e-07
Br-82	0.00e+00	0.00e+00	1.27e-05	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Br-83	0.00e+00	0.00e+00	3.63e-07	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Br-84	0.00e+00	0.00e+00	3.82e-07	0.00e+00	0.00e+00	0.00e+00	0.00e+00
Br-85	0.00e+00	0.00e+00	1.94e-08	0.00e+00	0.00e+00	0.00e+00	0.00e+00

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# DOSE CONVERSION FACTORS ALL AGE GROUPS BY NUCLIDE (INHALATION AND INGESTION)

Ingestion Dose Conversion factors for Infant age group by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Rb-86	0.00e+00	1.70e-04	8.40e-05	0.00e+00	0.00e+00	0.00e+00	4.35e-06
Rb-87	0.00e+00	8.88e-05	3.52e-05	0.00e+00	0.00e+00	0.00e+00	5.98e-07
Rb-88	0.00e+00	4.98e-07	2.73e-07	0.00e+00	0.00e+00	0.00e+00	4.85e-07
Rb-89	0.00e+00	2.86e-07	1.97e-07	0.00e+00	0.00e+00	0.00e+00	9.74e-08
Sr-89	2.51e-03	0.00e+00	7.20e-05	0.00e+00	0.00e+00	0.00e+00	5.16e-05
Sr-90	2.83e-02	0.00e+00	5.74e-04	0.00e+00	0.00e+00	0.00e+00	2.31e-04
Sr-91	5.00e-05	0.00e+00	1.81e-06	0.00e+00	0.00e+00	0.00e+00	5.92e-05
Sr-92	1.92e-05	0.00e+00	7.13e-07	0.00e+00	0.00e+00	0.00e+00	2.07e-04
Y-90	8.69e-08	0.00e+00	2.33e-09	0.00e+00	0.00e+00	0.00e+00	1.20e-04
Y-91	1.13e-06	0.00e+00	3.01e-08	0.00e+00	0.00e+00	0.00e+00	8.10e-05
Y-91m	8.10e-10	0.00e+00	2.76e-11	0.00e+00	0.00e+00	0.00e+00	2.70e-06
Y-92	7.65e-09	0.00e+00	2.15e-10	0.00e+00	0.00e+00	0.00e+00	1.46e-04
Y-93	2.43e-08	0.00e+00	6.62e-10	0.00e+00	0.00e+00	0.00e+00	1.92e-04
Zr-93	1.93e-07	9.19e-09	5.54e-09	0.00e+00	2.71e-08	0.00e+00	2.39e-06
Zr-95	2.06e-07	5.02e-08	3.56e-08	0.00e+00	5.41e-08	0.00e+00	2.50e-05
Zr-97	1.48e-08	2.54e-09	1.16e-09	0.00e+00	2.56e-09	0.00e+00	1.62e-04
Nb-93m	1.23e-07	3.33e-08	1.04e-08	0.00e+00	3.25e-08	0.00e+00	3.98e-06
Nb-95	4.20e-08	1.73e-08	1.00e-08	0.00e+00	1.24e-08	0.00e+00	1.46e-05
Nb-97	4.59e-10	9.79e-11	3.53e-11	0.00e+00	7.65e-11	0.00e+00	3.09e-05
Mo-93	0.00e+00	5.65e-05	1.82e-06	0.00e+00	1.13e-05	0.00e+00	1.21e-06
Mo-99	0.00e+00	3.40e-05	6.63e-06	0.00e+00	5.08e-05	0.00e+00	1.12e-05
Tc-101	2.27e-09	2.86e-09	2.83e-08	0.00e+00	3.40e-08	1.56e-09	4.86e-07
Tc-99	1.08e-06	1.46e-06	4.55e-07	0.00e+00	1.23e-05	1.42e-07	6.31e-06
Tc-99m	1.92e-09	3.96e-09	5.10e-08	0.00e+00	4.26e-08	2.07e-09	1.15e-06
Ru-103	1.48e-06	0.00e+00	4.95e-07	0.00e+00	3.08e-06	0.00e+00	1.80e-05
Ru-105	1.36e-07	0.00e+00	4.58e-08	0.00e+00	1.00e-06	0.00e+00	5.41e-05
Ru-106	2.41e-05	0.00e+00	3.01e-06	0.00e+00	2.85e-05	0.00e+00	1.83e-04
Rh-105	1.09e-06	7.13e-07	4.79e-07	0.00e+00	1.98e-06	0.00e+00	1.77e-05
Pd-107	0.00e+00	1.19e-06	8.45e-08	0.00e+00	6.79e-06	0.00e+00	9.46e-07
Pd-109	0.00e+00	1.50e-06	3.62e-07	0.00e+00	5.51e-06	0.00e+00	3.68e-05

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Ingestion Dose Conversion factors for Infant age group by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Ag-110m	9.96e-07	7.27e-07	4.81e-07	0.00e+00	1.04e-06	0.00e+00	3.77e-05
Ag-111	5.20e-07	2.02e-07	1.07e-07	0.00e+00	4.22e-07	0.00e+00	4.82e-05
Cd-113m	0.00e+00	1.77e-05	6.52e-07	0.00e+00	1.34e-05	0.00e+00	2.66e-05
Cd-115m	0.00e+00	1.42e-05	4.93e-07	0.00e+00	7.41e-06	0.00e+00	8.09e-05
Sn-123	2.49e-04	3.89e-06	6.50e-06	3.91e-06	0.00e+00	0.00e+00	6.58e-05
Sn-125	7.41e-05	1.38e-06	3.29e-06	1.36e-06	0.00e+00	0.00e+00	1.11e-04
Sn-126	5.53e-04	7.26e-06	1.80e-05	1.91e-06	0.00e+00	0.00e+00	2.52e-05
Sb-124	2.14e-05	3.15e-07	6.63e-06	5.68e-08	0.00e+00	1.34e-05	6.60e-05
Sb-125	1.23e-05	1.19e-07	2.53e-06	1.54e-08	0.00e+00	7.12e-06	1.64e-05
Sb-126	8.06e-06	1.58e-07	2.91e-06	6.19e-08	0.00e+00	5.07e-06	8.35e-05
Sb-127	2.23e-06	3.98e-08	6.90e-07	2.84e-08	0.00e+00	1.15e-06	5.91e-05
Te-125m	2.33e-05	7.79e-06	3.15e-06	7.84e-06	0.00e+00	0.00e+00	1.11e-05
Te-127	1.00e-06	3.35e-07	2.15e-07	8.14e-07	2.44e-06	0.00e+00	2.10e-05
Te-127m	5.85e-05	1.94e-05	7.08e-06	1.69e-05	1.44e-04	0.00e+00	2.36e-05
Te-129	2.84e-07	9.79e-08	6.63e-08	2.38e-07	7.07e-07	0.00e+00	2.27e-05
Te-129m	1.00e-04	3.43e-05	1.54e-05	3.84e-05	2.50e-04	0.00e+00	5.97e-05
Te-131	1.76e-07	6.50e-08	4.94e-08	1.57e-07	4.50e-07	0.00e+00	7.11e-06
Te-131m	1.52e-05	6.12e-06	5.05e-06	1.24e-05	4.21e-05	0.00e+00	1.03e-04
Te-132	2.08e-05	1.03e-05	9.61e-06	1.52e-05	6.44e-05	0.00e+00	3.81e-05
Te-133m	3.91e-07	1.79e-07	1.71e-07	3.45e-07	1.22e-06	0.00e+00	1.93e-05
Te-134	2.67e-07	1.34e-07	1.38e-07	2.39e-07	9.03e-07	0.00e+00	3.06e-06
I-129	2.86e-05	2.12e-05	1.55e-05	1.36e-02	2.51e-05	0.00e+00	4.24e-07
I-130	6.00e-06	1.32e-05	5.30e-06	1.48e-03	1.45e-05	0.00e+00	2.83e-06
I-131	3.59e-05	4.23e-05	1.86e-05	1.39e-02	4.94e-05	0.00e+00	1.51e-06
I-132	1.66e-06	3.37e-06	1.20e-06	1.58e-04	3.76e-06	0.00e+00	2.73e-06
I-133	1.25e-05	1.82e-05	5.33e-06	3.31e-03	2.14e-05	0.00e+00	3.08e-06
I-134	8.69e-07	1.78e-06	6.33e-07	4.15e-05	1.99e-06	0.00e+00	1.84e-06
I-135	3.64e-06	7.24e-06	2.64e-06	6.49e-04	8.07e-06	0.00e+00	2.62e-06
Cs-134	3.77e-04	7.03e-04	7.10e-05	0.00e+00	1.81e-04	7.42e-05	1.91e-06
Cs-134m	1.76e-07	2.93e-07	1.48e-07	0.00e+00	1.13e-07	2.60e-08	2.32e-07

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Ingestion Dose Conversion factors for Infant age group by nuclide.  
Waterford Steam Electric Station

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Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Cs-135	1.33e-04	1.21e-04	6.30e-06	0.00e+00	3.44e-05	1.31e-05	4.37e-07
Cs-136	4.59e-05	1.35e-04	5.04e-05	0.00e+00	5.38e-05	1.10e-05	2.05e-06
Cs-137	5.22e-04	6.11e-04	4.33e-05	0.00e+00	1.64e-04	6.64e-05	1.91e-06
Cs-138	4.81e-07	7.82e-07	3.79e-07	0.00e+00	3.90e-07	6.09e-08	1.25e-06
Cs-139	3.10e-07	4.24e-07	1.62e-07	0.00e+00	2.19e-07	3.30e-08	2.66e-08
Ba-139	8.81e-07	5.84e-10	2.55e-08	0.00e+00	3.51e-10	3.54e-10	5.58e-05
Ba-140	1.71e-04	1.71e-07	8.81e-06	0.00e+00	4.06e-08	1.05e-07	4.20e-05
Ba-141	4.25e-07	2.91e-10	1.34e-08	0.00e+00	1.75e-10	1.77e-10	5.19e-06
Ba-142	1.84e-07	1.53e-10	9.06e-09	0.00e+00	8.81e-11	9.26e-11	7.59e-07
La-140	2.11e-08	8.32e-09	2.14e-09	0.00e+00	0.00e+00	0.00e+00	9.77e-05
La-141	2.89e-09	8.38e-10	1.46e-10	0.00e+00	0.00e+00	0.00e+00	9.61e-05
La-142	1.10e-09	4.04e-10	9.67e-11	0.00e+00	0.00e+00	0.00e+00	6.86e-05
Ce-141	7.87e-08	4.80e-08	5.65e-09	0.00e+00	1.48e-08	0.00e+00	2.48e-05
Ce-143	1.48e-08	9.82e-06	1.12e-09	0.00e+00	2.86e-09	0.00e+00	5.73e-05
Ce-144	2.98e-06	1.22e-06	1.67e-07	0.00e+00	4.93e-07	0.00e+00	1.71e-04
Pr-143	8.13e-08	3.04e-08	4.03e-09	0.00e+00	1.13e-08	0.00e+00	4.29e-05
Pr-144	2.74e-10	1.06e-10	1.38e-11	0.00e+00	3.84e-11	0.00e+00	4.93e-06
Nd-147	5.53e-08	5.68e-08	3.48e-09	0.00e+00	2.19e-08	0.00e+00	3.60e-05
Pm-147	3.88e-07	3.27e-08	1.59e-08	0.00e+00	4.88e-08	0.00e+00	9.27e-06
Pm-148	6.32e-08	9.13e-09	4.60e-09	0.00e+00	1.09e-08	0.00e+00	9.74e-05
Pm-148m	1.65e-07	4.18e-08	3.28e-08	0.00e+00	4.80e-08	0.00e+00	5.44e-05
Pm-149	1.38e-08	1.81e-09	7.90e-10	0.00e+00	2.20e-09	0.00e+00	4.86e-05
Pm-151	6.18e-09	9.01e-10	4.56e-10	0.00e+00	1.07e-09	0.00e+00	4.17e-05
Sm-151	2.90e-07	6.67e-08	1.44e-08	0.00e+00	4.53e-08	0.00e+00	5.58e-06
Sm-153	7.72e-09	5.97e-09	4.58e-10	0.00e+00	1.25e-09	0.00e+00	3.12e-05
Eu-152	6.74e-07	1.79e-07	1.51e-07	0.00e+00	5.02e-07	0.00e+00	1.59e-05
Eu-154	2.64e-06	3.67e-07	2.20e-07	0.00e+00	9.95e-07	0.00e+00	4.58e-05
Eu-155	5.42e-07	6.25e-08	3.23e-08	0.00e+00	1.40e-07	0.00e+00	8.37e-05
Eu-156	1.14e-07	7.06e-08	1.12e-08	0.00e+00	3.26e-08	0.00e+00	6.67e-05
Tb-160	2.59e-07	0.00e+00	3.24e-08	0.00e+00	7.37e-08	0.00e+00	3.45e-05

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Ingestion Dose Conversion factors for Infant age group by nuclide.  
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Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Ho-166m	1.25e-06	2.69e-07	2.13e-07	0.00e+00	3.57e-07	0.00e+00	2.66e-05
W-181	8.85e-08	2.72e-08	3.04e-09	0.00e+00	0.00e+00	0.00e+00	3.82e-07
W-185	3.62e-06	1.13e-06	1.29e-07	0.00e+00	0.00e+00	0.00e+00	1.62e-05
W-187	9.03e-07	6.28e-07	2.17e-07	0.00e+00	0.00e+00	0.00e+00	3.69e-05
Pb-210	5.28e-02	1.42e-02	2.38e-03	0.00e+00	4.33e-02	0.00e+00	2.32e-06
Bi-210	4.16e-06	2.68e-05	2.39e-06	0.00e+00	2.08e-04	0.00e+00	5.27e-05
Po-210	3.10e-03	5.93e-03	7.41e-04	0.00e+00	1.26e-02	0.00e+00	6.61e-05
Ra-223	4.41e-02	6.42e-05	8.82e-03	0.00e+00	1.17e-03	0.00e+00	3.43e-04
Ra-224	1.46e-02	3.29e-05	2.91e-03	0.00e+00	6.00e-04	0.00e+00	3.86e-04
Ra-225	5.78e-02	6.52e-05	1.15e-02	0.00e+00	1.19e-03	0.00e+00	3.24e-04
Ra-226	6.20e-01	4.76e-05	5.14e-01	0.00e+00	8.71e-04	0.00e+00	3.44e-04
Ra-228	4.32e-01	2.58e-05	4.86e-01	0.00e+00	4.73e-04	0.00e+00	5.86e-05
Ac-225	3.92e-05	5.03e-05	2.63e-06	0.00e+00	3.69e-06	0.00e+00	4.36e-04
Ac-227	4.49e-03	7.67e-04	2.79e-04	0.00e+00	1.56e-04	0.00e+00	8.50e-05
Th-227	1.20e-04	2.01e-06	3.45e-06	0.00e+00	7.41e-06	0.00e+00	5.70e-04
Th-228	2.47e-03	3.38e-05	8.36e-05	0.00e+00	1.58e-04	0.00e+00	5.84e-04
Th-229	2.52e-02	6.33e-04	4.20e-04	0.00e+00	3.03e-03	0.00e+00	8.10e-05
Th-230	3.80e-03	1.90e-04	1.06e-04	0.00e+00	9.12e-04	0.00e+00	6.24e-05
Th-232	4.24e-03	1.63e-04	1.65e-06	0.00e+00	7.79e-04	0.00e+00	5.31e-05
Th-234	6.92e-07	3.77e-08	2.00e-08	0.00e+00	1.39e-07	0.00e+00	1.19e-04
Pa-231	7.57e-03	2.50e-04	3.02e-04	0.00e+00	1.34e-03	0.00e+00	7.44e-05
Pa-233	3.11e-08	6.09e-09	5.43e-09	0.00e+00	1.67e-08	0.00e+00	1.46e-05
U-232	2.42e-02	0.00e+00	2.16e-03	0.00e+00	2.37e-03	0.00e+00	7.04e-05
U-233	5.08e-03	0.00e+00	3.87e-04	0.00e+00	1.08e-03	0.00e+00	6.51e-05
U-234	4.88e-03	0.00e+00	3.80e-04	0.00e+00	1.06e-03	0.00e+00	6.37e-05
U-235	4.67e-03	0.00e+00	3.56e-04	0.00e+00	9.93e-04	0.00e+00	8.10e-05
U-236	4.67e-03	0.00e+00	3.64e-04	0.00e+00	1.01e-03	0.00e+00	5.98e-05
U-237	4.95e-07	0.00e+00	1.32e-07	0.00e+00	1.23e-06	0.00e+00	2.11e-05
U-238	4.47e-03	0.00e+00	3.33e-04	0.00e+00	9.28e-04	0.00e+00	5.71e-05
Np-237	2.40e-03	1.59e-04	1.05e-04	0.00e+00	6.34e-04	0.00e+00	8.23e-05

Conversion factors are in units of mrem per pCi ingested.

**DOSE CONVERSION FACTORS ALL AGE GROUPS  
BY NUCLIDE (INHALATION AND INGESTION)**

Ingestion Dose Conversion factors for Infant age group by nuclide.  
Waterford Steam Electric Station

Nuclide	Organ Dose Conversion Factors						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Np-238	1.24e-07	3.12e-09	1.92e-09	0.00e+00	6.81e-09	0.00e+00	4.17e-05
Np-239	1.11e-08	9.93e-10	5.61e-10	0.00e+00	1.98e-09	0.00e+00	2.87e-05
Pu-238	1.28e-03	1.50e-04	3.40e-05	0.00e+00	1.21e-04	0.00e+00	7.57e-05
Pu-239	1.38e-03	1.55e-04	3.54e-05	0.00e+00	1.28e-04	0.00e+00	6.91e-05
Pu-240	1.38e-03	1.55e-04	3.54e-05	0.00e+00	1.28e-04	0.00e+00	7.04e-05
Pu-241	4.25e-05	1.76e-06	8.82e-07	0.00e+00	3.17e-06	0.00e+00	1.45e-06
Pu-242	1.28e-03	1.49e-04	3.41e-05	0.00e+00	1.23e-04	0.00e+00	6.77e-05
Pu-244	1.49e-03	1.71e-04	3.91e-05	0.00e+00	1.41e-04	0.00e+00	1.01e-04
Am-241	1.46e-03	1.27e-03	1.09e-04	0.00e+00	6.55e-04	0.00e+00	7.70e-05
Am-242m	1.51e-03	1.22e-03	1.13e-04	0.00e+00	6.64e-04	0.00e+00	9.69e-05
Am-243	1.44e-03	1.23e-03	1.06e-04	0.00e+00	6.36e-04	0.00e+00	9.03e-05
Cm-242	1.37e-04	1.27e-04	9.10e-06	0.00e+00	2.62e-05	0.00e+00	8.23e-05
Cm-243	1.40e-03	1.15e-03	8.98e-05	0.00e+00	3.27e-04	0.00e+00	8.10e-05
Cm-244	1.18e-03	9.70e-04	7.59e-05	0.00e+00	2.71e-04	0.00e+00	7.84e-05
Cm-245	1.79e-03	1.45e-03	1.13e-04	0.00e+00	4.32e-04	0.00e+00	7.30e-05
Cm-246	1.77e-03	1.45e-03	1.13e-04	0.00e+00	4.31e-04	0.00e+00	7.17e-05
Cm-247	1.73e-03	1.43e-03	1.11e-04	0.00e+00	4.24e-04	0.00e+00	9.43e-05
Cm-248	1.43e-02	1.18e-02	9.16e-04	0.00e+00	3.50e-03	0.00e+00	1.52e-03
Cf-252	1.22e-03	0.00e+00	2.95e-05	0.00e+00	0.00e+00	0.00e+00	2.99e-04

Conversion factors are in units of mrem per pCi ingested.

SPECIFIC FACTORS USED TO DETERMINE  $A_i$ ,  $P_i$ ,  $R_i$  VALUES FOR THE  
OFFSITE DOSE CALCULATION MANUAL

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Values for  $A_i$ ,  $P_i$ , and  $R_i$  were calculated as per NUREG-0133. Recommended values for various factors in the calculations were as specified in NUREG-0133. The location of most of the recommended factors are contained in USNRC Regulatory Guide 1.109, NUREG 0172, and NUREG/CR 1276. All factors used in Waterford-3 SES's calculations are for the maximum individual and are not site specific. The various factors are discussed below.

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- Stable element transfer coefficients for vegetation, cow's milk, goat's milk and meat (Attachment 7.22, pages 10 - 12) were obtained from NUREG/CR 1276.
- Animal consumption rates (Attachment 7.22, page 2) were obtained from USNRC Regulatory Guide 1.109.
- Usage or consumption rates for adult, teen, child, and infant age groups (Attachment 7.22, page 3) were obtained from USNRC Regulatory Guide 1.109. These values are for the maximum exposed individual.
- External dose factors for standing on contaminated ground (Attachment 7.20) were obtained from NUREG/CR 1276.
- Bioaccumulation factors for freshwater and saltwater vertebrates and invertebrates (Attachment 7.22, page 13 - 15) were obtained from NUREG/CR 1276.
- Inhalation and ingestion dose factors for adult, teen, child, and infant age groups (Attachment 7.21) were obtained from NUREG/CR 1276.
- Radionuclide half-lives and decay constants are included Attachment 7.22, pages 4 - 9.
- Other factors (Attachment 7.22, page 16 - 18) used were obtained from USNRC Regulatory Guide 1.109 for various parameters,.

SPECIFIC FACTORS USED TO DETERMINE  $A_i$ ,  $P_i$ ,  $R_i$  VALUES FOR THE  
OFFSITE DOSE CALCULATION MANUAL

Animal Consumption rates.

Waterford Steam Electric Station

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Milk cow's feed intake rate :	50.00 kg/day
Milk cow's water intake rate :	60.00 l/day
Beef cow's feed intake rate :	50.00 kg/day
Beef cow's water intake rate :	50.00 l/day
Goat's feed intake rate :	6.00 kg/day
Goat's water intake rate :	8.00 l/day

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SPECIFIC FACTORS USED TO DETERMINE  $A_i$ ,  $P_i$ ,  $R_i$  VALUES FOR THE  
OFFSITE DOSE CALCULATION MANUAL

Consumption rates for MAXIMAL individuals.  
Waterford Steam Electric Station

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produce veg	usage rate for the Adult	:	520.0	kg/yr
produce veg	usage rate for the Teen	:	630.0	kg/yr
produce veg	usage rate for the Child	:	520.0	kg/yr
produce veg	usage rate for the Infant	:	0.0	kg/yr
<hr/>				
leafy veg	usage rate for the Adult	:	64.0	kg/yr
leafy veg	usage rate for the Teen	:	42.0	kg/yr
leafy veg	usage rate for the Child	:	26.0	kg/yr
leafy veg	usage rate for the Infant	:	0.0	kg/yr
<hr/>				
milk	usage rate for the Adult	:	310.0	l/yr
milk	usage rate for the Teen	:	400.0	l/yr
milk	usage rate for the Child	:	330.0	l/yr
milk	usage rate for the Infant	:	330.0	l/yr
<hr/>				
meat/poultry	usage rate for the Adult	:	110.0	kg/yr
meat/poultry	usage rate for the Teen	:	65.0	kg/yr
meat/poultry	usage rate for the Child	:	41.0	kg/yr
meat/poultry	usage rate for the Infant	:	0.0	kg/yr
<hr/>				
fish	usage rate for the Adult	:	21.0	kg/yr
fish	usage rate for the Teen	:	16.0	kg/yr
fish	usage rate for the Child	:	6.9	kg/yr
fish	usage rate for the Infant	:	0.0	kg/yr
<hr/>				
seafood	usage rate for the Adult	:	5.0	kg/yr
seafood	usage rate for the Teen	:	3.8	kg/yr
seafood	usage rate for the Child	:	1.7	kg/yr
seafood	usage rate for the Infant	:	0.0	kg/yr
<hr/>				
drink h2o	usage rate for the Adult	:	730.0	l/yr
drink h2o	usage rate for the Teen	:	510.0	l/yr
drink h2o	usage rate for the Child	:	510.0	l/yr
drink h2o	usage rate for the Infant	:	330.0	l/yr
<hr/>				
shore rec	usage rate for the Adult	:	12.0	hr/yr
shore rec	usage rate for the Teen	:	67.0	hr/yr
shore rec	usage rate for the Child	:	14.0	hr/yr
shore rec	usage rate for the Infant	:	0.0	hr/yr
<hr/>				
inhalation	usage rate for the Adult	:	8000.0	m3/yr
inhalation	usage rate for the Teen	:	8000.0	m3/yr
inhalation	usage rate for the Child	:	3700.0	m3/yr
inhalation	usage rate for the Infant	:	1400.0	m3/yr

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# SPECIFIC FACTORS USED TO DETERMINE $A_i$ , $P_i$ , $R_i$ VALUES FOR THE OFFSITE DOSE CALCULATION MANUAL

Radionuclide Parameters used.  
Waterford Steam Electric Station

Nuclide	Parameters	
	Half-life	Decay constant
H-3	1.2280e+01 years	1.7899e-09 1/seconds
Be-10	1.6000e+06 years	1.3737e-14 1/seconds
C-14	5.7300e+03 years	3.8359e-12 1/seconds
N-13	9.9700e+00 minutes	1.1587e-03 1/seconds
F-18	1.8300e+00 hours	1.0521e-04 1/seconds
Na-22	2.6000e+00 years	8.4537e-09 1/seconds
Na-24	1.5000e+01 hours	1.2836e-05 1/seconds
P-32	1.4290e+01 days	5.6141e-07 1/seconds
Ca-41	1.3000e+05 years	1.6907e-13 1/seconds
Sc-46	8.3800e+01 days	9.5734e-08 1/seconds
Cr-51	2.7704e+01 days	2.8958e-07 1/seconds
Mn-54	3.1270e+02 days	2.5656e-08 1/seconds
Mn-56	2.5758e+00 hours	7.4750e-05 1/seconds
Fe-55	2.7000e+00 years	8.1406e-09 1/seconds
Fe-59	4.4630e+01 days	1.7976e-07 1/seconds
Co-57	2.7000e+02 days	2.9713e-08 1/seconds
Co-58	7.0800e+01 days	1.1331e-07 1/seconds
Co-60	5.2710e+00 years	4.1699e-09 1/seconds
Ni-59	7.5000e+04 years	2.9306e-13 1/seconds
Ni-63	1.0010e+02 years	2.1958e-10 1/seconds
Ni-65	2.5200e+00 hours	7.6405e-05 1/seconds
Cu-64	1.2701e+01 hours	1.5160e-05 1/seconds
Zn-65	2.4440e+02 days	3.2825e-08 1/seconds
Zn-69	5.5600e+01 minutes	2.0778e-04 1/seconds
Zn-69m	1.3800e+01 hours	1.3952e-05 1/seconds
Se-79	6.5000e+04 years	3.3815e-13 1/seconds
Br-82	1.4700e+00 days	5.4575e-06 1/seconds
Br-83	2.3900e+00 hours	8.0561e-05 1/seconds
Br-84	3.1800e+01 minutes	3.6328e-04 1/seconds
Br-85	1.7200e+02 seconds	4.0299e-03 1/seconds

# SPECIFIC FACTORS USED TO DETERMINE $A_i$ , $P_i$ , $R_i$ VALUES FOR THE OFFSITE DOSE CALCULATION MANUAL

Radionuclide Parameters used.  
Waterford Steam Electric Station

Nuclide	Parameters	
	Half-life	Decay constant
Rb-86	1.8660e+01 days	4.2993e-07 1/seconds
Rb-87	4.6000e+10 years	4.7782e-19 1/seconds
Rb-88	1.7800e+01 minutes	6.4901e-04 1/seconds
Rb-89	1.5440e+01 minutes	7.4822e-04 1/seconds
Sr-89	5.0550e+01 days	1.5870e-07 1/seconds
Sr-90	2.8600e+01 years	7.6852e-10 1/seconds
Sr-91	9.5000e+00 hours	2.0267e-05 1/seconds
Sr-92	2.7100e+00 hours	7.1048e-05 1/seconds
Y-90	6.4100e+01 hours	3.0038e-06 1/seconds
Y-91	5.8510e+01 days	1.3711e-07 1/seconds
Y-91m	4.9710e+01 minutes	2.3240e-04 1/seconds
Y-92	3.5400e+00 hours	5.4390e-05 1/seconds
Y-93	1.0100e+01 hours	1.9063e-05 1/seconds
Zr-93	1.5000e+06 years	1.4653e-14 1/seconds
Zr-95	6.4020e+01 days	1.2531e-07 1/seconds
Zr-97	1.6900e+01 hours	1.1393e-05 1/seconds
Nb-93m	1.3600e+01 years	1.6161e-09 1/seconds
Nb-95	3.5060e+01 days	2.2882e-07 1/seconds
Nb-97	1.2300e+00 hours	1.5654e-04 1/seconds
Mo-93	3.5000e+03 years	6.2799e-12 1/seconds
Mo-99	6.6020e+01 hours	2.9164e-06 1/seconds
Tc-101	1.4200e+01 minutes	8.1355e-04 1/seconds
Tc-99	2.1400e+05 years	1.0271e-13 1/seconds
Tc-99m	6.0200e+00 hours	3.1984e-05 1/seconds
Ru-103	3.9350e+01 days	2.0388e-07 1/seconds
Ru-105	4.4400e+00 hours	4.3365e-05 1/seconds
Ru-106	3.6820e+02 days	2.1789e-08 1/seconds
Rh-105	1.4700e+00 days	5.4575e-06 1/seconds
Pd-107	6.5000e+06 years	3.3815e-15 1/seconds
Pd-109	1.3500e+01 hours	1.4262e-05 1/seconds



# SPECIFIC FACTORS USED TO DETERMINE $A_i$ , $P_i$ , $R_i$ VALUES FOR THE OFFSITE DOSE CALCULATION MANUAL

Radionuclide Parameters used.  
Waterford Steam Electric Station

Nuclide	Parameters	
	Half-life	Decay constant
Ag-110m	2.4985e+02 days	3.2109e-08 1/seconds
Ag-111	7.4500e+00 days	1.0769e-06 1/seconds
Cd-113m	1.4600e+01 years	1.5054e-09 1/seconds
Cd-115m	4.4600e+01 days	1.7988e-07 1/seconds
Sn-123	1.2900e+02 days	6.2190e-08 1/seconds
Sn-125	9.6200e+00 days	8.3394e-07 1/seconds
Sn-126	1.0000e+05 years	2.1980e-13 1/seconds
Sb-124	6.0200e+01 days	1.3326e-07 1/seconds
Sb-125	2.7700e+00 years	7.9349e-09 1/seconds
Sb-126	1.2500e+01 days	6.4180e-07 1/seconds
Sb-127	9.3000e+01 hours	2.0703e-06 1/seconds
Te-125m	5.8000e+01 days	1.3832e-07 1/seconds
Te-127	9.3500e+00 hours	2.0593e-05 1/seconds
Te-127m	1.0900e+02 days	7.3601e-08 1/seconds
Te-129	6.9600e+01 minutes	1.6598e-04 1/seconds
Te-129m	3.3600e+01 days	2.3877e-07 1/seconds
Te-131	2.5000e+01 minutes	4.6210e-04 1/seconds
Te-131m	3.0000e+01 hours	6.4180e-06 1/seconds
Te-132	7.8200e+01 hours	2.4622e-06 1/seconds
Te-133m	5.5400e+01 minutes	2.0853e-04 1/seconds
Te-134	4.1800e+01 minutes	2.7637e-04 1/seconds
I-129	1.5700e+07 years	1.4000e-15 1/seconds
I-130	1.2360e+01 hours	1.5578e-05 1/seconds
I-131	8.0400e+00 days	9.9783e-07 1/seconds
I-132	2.3000e+00 hours	8.3713e-05 1/seconds
I-133	2.0800e+01 hours	9.2568e-06 1/seconds
I-134	5.2600e+01 minutes	2.1963e-04 1/seconds
I-135	6.6100e+00 hours	2.9129e-05 1/seconds
Cs-134	2.0620e+00 years	1.0659e-08 1/seconds
Cs-134m	2.9000e+00 hours	6.6393e-05 1/seconds

# SPECIFIC FACTORS USED TO DETERMINE $A_i$ , $P_i$ , $R_i$ , VALUES FOR THE OFFSITE DOSE CALCULATION MANUAL

Radionuclide Parameters used.  
Waterford Steam Electric Station

Nuclide	Parameters	
	Half-life	Decay constant
<hr/>		
Cs-135	2.0000e+06 years	1.0990e-14 1/seconds
Cs-136	1.3160e+01 days	6.0962e-07 1/seconds
Cs-137	3.0170e+01 years	7.2852e-10 1/seconds
<hr/>		
Cs-138	3.2200e+01 minutes	3.5877e-04 1/seconds
Cs-139	9.4000e+00 minutes	1.2290e-03 1/seconds
Ba-139	8.3100e+01 minutes	1.3902e-04 1/seconds
<hr/>		
Ba-140	1.2789e+01 days	6.2730e-07 1/seconds
Ba-141	1.8270e+01 minutes	6.3232e-04 1/seconds
Ba-142	1.0700e+01 minutes	1.0797e-03 1/seconds
<hr/>		
La-140	4.0220e+01 hours	4.7872e-06 1/seconds
La-141	3.9300e+00 hours	4.8993e-05 1/seconds
La-142	9.5400e+01 minutes	1.2109e-04 1/seconds
<hr/>		
Ce-141	3.2500e+01 days	2.4685e-07 1/seconds
Ce-143	3.3000e+01 hours	5.8346e-06 1/seconds
Ce-144	2.8430e+02 days	2.8219e-08 1/seconds
<hr/>		
Pr-143	1.3560e+01 days	5.9163e-07 1/seconds
Pr-144	1.7280e+01 minutes	6.6854e-04 1/seconds
Nd-147	1.0980e+01 days	7.3065e-07 1/seconds
<hr/>		
Pm-147	2.6200e+00 years	8.3891e-09 1/seconds
Pm-148	5.3700e+00 days	1.4940e-06 1/seconds
Pm-148m	4.1300e+01 days	1.9425e-07 1/seconds
<hr/>		
Pm-149	2.2100e+00 days	3.6301e-06 1/seconds
Pm-151	1.1800e+00 days	6.7988e-06 1/seconds
Sm-151	9.3000e+01 years	2.3634e-10 1/seconds
<hr/>		
Sm-153	1.9500e+00 days	4.1141e-06 1/seconds
Eu-152	1.2700e+01 years	1.7307e-09 1/seconds
Eu-154	1.6000e+02 years	1.3737e-10 1/seconds
<hr/>		
Eu-155	1.8000e+00 years	1.2211e-08 1/seconds
Eu-156	1.5200e+01 days	5.2780e-07 1/seconds
Tb-160	7.2100e+01 days	1.1127e-07 1/seconds

# SPECIFIC FACTORS USED TO DETERMINE $A_i$ , $P_i$ , $R_i$ VALUES FOR THE OFFSITE DOSE CALCULATION MANUAL

Radionuclide Parameters used.  
Waterford Steam Electric Station

Nuclide	Parameters	
	Half-life	Decay constant
Ho-166m	1.2000e+03 years	1.8316e-11 1/seconds
W-181	1.2100e+02 days	6.6302e-08 1/seconds
W-185	7.5100e+01 days	1.0682e-07 1/seconds
W-187	2.3830e+01 hours	8.0798e-06 1/seconds
Pb-210	2.0400e+01 years	1.0774e-09 1/seconds
Bi-210	5.0100e+00 days	1.6013e-06 1/seconds
Po-210	1.3800e+02 days	5.8134e-08 1/seconds
Ra-223	1.1400e+01 days	7.0373e-07 1/seconds
Ra-224	3.6600e+00 days	2.1919e-06 1/seconds
Ra-225	1.4800e+01 days	5.4206e-07 1/seconds
Ra-226	1.6000e+03 years	1.3737e-11 1/seconds
Ra-228	5.7500e+00 years	3.8225e-09 1/seconds
Ac-225	1.0000e+01 days	8.0225e-07 1/seconds
Ac-227	2.1800e+01 years	1.0082e-09 1/seconds
Th-227	1.8500e+01 days	4.3365e-07 1/seconds
Th-228	1.9100e+00 years	1.1508e-08 1/seconds
Th-229	7.3400e+03 years	2.9945e-12 1/seconds
Th-230	7.7000e+04 years	2.8545e-13 1/seconds
Th-232	1.4100e+10 years	1.5588e-18 1/seconds
Th-234	2.4100e+01 days	3.3289e-07 1/seconds
Pa-231	3.2800e+04 years	6.7011e-13 1/seconds
Pa-233	2.7400e+01 days	2.9279e-07 1/seconds
U-232	7.2000e+01 years	3.0527e-10 1/seconds
U-233	1.5800e+05 years	1.3911e-13 1/seconds
U-234	2.4800e+05 years	8.8627e-14 1/seconds
U-235	7.0400e+08 years	3.1221e-17 1/seconds
U-236	3.3400e+07 years	6.5807e-16 1/seconds
U-237	6.7500e+00 days	1.1885e-06 1/seconds
U-238	4.7000e+09 years	4.6765e-18 1/seconds
Np-237	2.1400e+06 years	1.0271e-14 1/seconds

SPECIFIC FACTORS USED TO DETERMINE  $A_i$ ,  $P_i$ ,  $R_i$ , VALUES FOR THE  
OFFSITE DOSE CALCULATION MANUAL

Radionuclide Parameters used.  
Waterford Steam Electric Station

Nuclide	Parameters	
	Half-life	Decay constant
Np-238	2.1200e+00 days	3.7842e-06 1/seconds
Np-239	2.3550e+00 days	3.4066e-06 1/seconds
Pu-238	8.7800e+01 years	2.5034e-10 1/seconds
Pu-239	2.4100e+04 years	9.1201e-13 1/seconds
Pu-240	6.5400e+03 years	3.3608e-12 1/seconds
Pu-241	1.5200e+01 years	1.4460e-09 1/seconds
Pu-242	3.8700e+05 years	5.6795e-14 1/seconds
Pu-244	8.2600e+07 years	2.6610e-16 1/seconds
Am-241	4.3300e+00 years	5.0761e-09 1/seconds
Am-242m	1.5200e+02 years	1.4460e-10 1/seconds
Am-243	7.3800e+03 years	2.9783e-12 1/seconds
Cm-242	1.6300e+02 days	4.9218e-08 1/seconds
Cm-243	2.8500e+01 years	7.7121e-10 1/seconds
Cm-244	1.8100e+01 years	1.2143e-09 1/seconds
Cm-245	8.5000e+03 years	2.5858e-12 1/seconds
Cm-246	4.8200e+03 years	4.5601e-12 1/seconds
Cm-247	1.5600e+07 years	1.4089e-15 1/seconds
Cm-248	3.6100e+05 years	6.0885e-14 1/seconds
Cf-252	2.4600e+00 years	8.9348e-09 1/seconds

# SPECIFIC FACTORS USED TO DETERMINE A<sub>i</sub>, P<sub>i</sub>, R<sub>i</sub> VALUES FOR THE OFFSITE DOSE CALCULATION MANUAL

Stable Element Transfer Coefficients by nuclide.  
Waterford Steam Electric Station

Element	Stable Element Transfer Data			
	Biv Veg/Soil	Fm Cow Milk	Ff Meat	Fm Goat Milk
H	4.80e+00	1.00e-02	1.20e-02	1.70e-01
He	5.00e-02	2.00e-02	2.00e-02	2.00e-02
Li	8.30e-04	5.00e-02	1.00e-02	5.00e-02
Be	4.20e-04	1.00e-04	1.00e-03	1.00e-04
B	1.20e-01	2.70e-03	8.00e-04	2.70e-03
C	5.50e+00	1.20e-02	3.10e-02	1.00e-01
N	7.50e+00	2.20e-02	7.70e-02	2.20e-02
O	1.60e+00	2.00e-02	1.60e-02	2.00e-02
F	6.50e-04	1.40e-02	1.50e-01	1.40e-02
Ne	1.40e-01	2.00e-02	2.00e-02	2.00e-02
Na	5.20e-02	4.00e-02	3.00e-02	4.00e-02
Mg	1.30e-01	1.00e-02	5.00e-03	1.00e-02
Al	1.80e-04	5.00e-04	1.50e-03	5.00e-04
Si	1.50e-04	1.00e-04	4.00e-05	1.00e-04
P	1.10e+00	2.50e-02	4.60e-02	2.50e-01
S	5.90e-01	1.80e-02	1.00e-01	1.80e-02
Cl	5.00e+00	5.00e-02	8.00e-02	5.00e-02
Ar	6.00e-01	2.00e-02	2.00e-02	2.00e-02
K	3.70e-01	1.00e-02	1.20e-02	1.00e-02
Ca	3.60e-02	8.00e-03	4.00e-03	8.00e-03
Sc	1.10e-03	5.00e-06	1.60e-02	5.00e-06
Ti	5.40e-05	5.00e-06	3.10e-02	5.00e-06
V	1.30e-03	1.00e-03	2.30e-03	1.00e-03
Cr	2.50e-04	2.20e-03	2.40e-03	2.20e-03
Mn	2.90e-02	2.50e-04	8.00e-04	2.50e-04
Fe	6.60e-04	1.20e-03	4.00e-02	1.30e-04
Co	9.40e-03	1.00e-03	1.30e-02	1.00e-03
Ni	1.90e-02	6.70e-03	5.30e-03	6.70e-03
Cu	1.20e-01	1.40e-02	8.00e-03	1.30e-02
Zn	4.00e-01	3.90e-02	3.00e-02	3.90e-02
Ga	2.50e-04	5.00e-05	1.30e+00	5.00e-05
Ge	1.00e-01	5.00e-04	2.00e+01	5.00e-04
As	1.00e-02	6.00e-03	2.00e-03	6.00e-03
Se	1.30e+00	4.50e-02	1.50e-02	4.50e-02
Br	7.60e-01	5.00e-02	2.60e-02	5.00e-02

Units for transfer data are derived as follows:

Biv -> pCi/kg in vegetation per pCi/kg in soil (no units),

Fm -> pCi/liter in milk per pCi/day ingested by animal (days/liter),

Ff -> pCi/kg in meat per pCi/day ingested by animal (days/kg).

# SPECIFIC FACTORS USED TO DETERMINE $A_i$ , $P_i$ , $R_i$ VALUES FOR THE OFFSITE DOSE CALCULATION MANUAL

Stable Element Transfer Coefficients by nuclide.  
Waterford Steam Electric Station

Element	Stable Element Transfer Data			
	Biv Veg/Soil	Fm Cow Milk	Ff Meat	Fm Goat Milk
Kr	3.00e+00	2.00e-02	2.00e-02	2.00e-02
Rb	1.30e-01	3.00e-02	3.10e-02	3.00e-02
Sr	1.70e-02	8.00e-04	6.00e-04	1.40e-02
Y	2.60e-03	1.00e-05	4.60e-03	1.00e-05
Zr	1.70e-04	5.00e-06	3.40e-02	5.00e-06
Nb	9.40e-03	2.50e-03	2.80e-01	2.50e-03
Mo	1.20e-01	7.50e-03	8.00e-03	7.50e-03
Tc	2.50e-01	2.50e-02	4.00e-01	2.50e-02
Ru	5.00e-02	1.00e-06	4.00e-01	1.00e-06
Rh	1.30e+01	1.00e-02	1.50e-03	1.00e-02
Pd	5.00e+00	1.00e-02	4.00e-03	1.00e-02
Ag	1.50e-01	5.00e-02	1.70e-02	5.00e-02
Cd	3.00e-01	1.20e-04	5.30e-04	1.20e-04
In	2.50e-01	1.00e-04	8.00e-03	1.00e-04
Sn	2.50e-03	2.50e-03	8.00e-02	2.50e-03
Sb	1.10e-02	1.50e-03	4.00e-03	1.50e-03
Te	1.30e+00	1.00e-03	7.70e-02	1.00e-03
I	2.00e-02	6.00e-03	2.90e-03	6.00e-03
Xe	1.00e+01	2.00e-02	2.00e-02	2.00e-02
Cs	1.00e-02	1.20e-02	4.00e-03	3.00e-01
Ba	5.00e-03	4.00e-04	3.20e-03	4.00e-04
La	2.50e-03	5.00e-06	2.00e-04	5.00e-06
Ce	2.50e-03	1.00e-04	1.20e-03	1.00e-04
Pr	2.50e-03	5.00e-06	4.70e-03	5.00e-06
Nd	2.40e-03	5.00e-06	3.30e-03	5.00e-06
Pm	2.50e-03	5.00e-06	4.80e-03	5.00e-06
Sm	2.50e-03	5.00e-06	5.00e-03	5.00e-06
Eu	2.50e-03	5.00e-06	4.80e-03	5.00e-06
Gd	2.60e-03	5.00e-06	3.60e-03	5.00e-06
Tb	2.60e-03	5.00e-06	4.40e-03	5.00e-06
Dy	2.50e-03	5.00e-06	5.30e-03	5.00e-06
Ho	2.60e-03	5.00e-06	4.40e-03	5.00e-06
Er	2.50e-03	5.00e-06	4.00e-03	5.00e-06
Tm	2.60e-03	5.00e-06	4.40e-03	5.00e-06
Yb	2.50e-03	5.00e-06	4.00e-03	5.00e-06

Units for transfer data are derived as follows:

Biv -> pCi/kg in vegetation per pCi/kg in soil (no units),

Fm -> pCi/liter in milk per pCi/day ingested by animal (days/liter),

Ff -> pCi/kg in meat per pCi/day ingested by animal (days/kg).

# SPECIFIC FACTORS USED TO DETERMINE $A_i$ , $P_i$ , $R_i$ VALUES FOR THE OFFSITE DOSE CALCULATION MANUAL

Stable Element Transfer Coefficients by nuclide.  
Waterford Steam Electric Station

Element	Stable Element Transfer Data			
	Biv Veg/Soil	Fm Cow Milk	Ff Meat	Fm Goat Milk
Lu	2.60e-03	5.00e-06	4.40e-03	5.00e-06
Hf	1.70e-04	5.00e-06	4.00e-01	5.00e-06
Ta	6.30e-03	2.50e-02	1.60e+00	2.50e-02
W	1.80e-02	5.00e-04	1.39e-03	5.00e-04
Re	2.50e-01	2.50e-02	8.00e-03	2.50e-02
Os	5.00e-02	5.00e-03	4.00e-01	5.00e-03
Ir	1.30e+01	5.00e-03	1.50e-03	5.00e-03
Pt	5.00e-01	5.00e-03	4.00e-03	5.00e-03
Au	2.50e-03	5.00e-03	8.00e-03	5.00e-03
Hg	3.80e-01	3.80e-02	2.60e-01	3.80e-02
Tl	2.50e-01	2.20e-02	4.00e-02	2.20e-02
Pb	6.80e-02	6.20e-04	2.90e-04	6.20e-04
Bi	1.50e-01	5.00e-04	1.30e-02	5.00e-04
Po	1.50e-01	3.00e-04	1.20e-02	3.00e-04
At	2.50e-01	5.00e-02	8.00e+00	5.00e-02
Rn	3.50e+00	2.00e-02	2.00e-02	2.00e-02
Fr	1.00e-02	5.00e-02	2.00e-02	5.00e-02
Ra	3.10e-04	8.00e-03	3.40e-02	8.00e-03
Ac	2.50e-03	5.00e-06	6.00e-02	5.00e-06
Th	4.20e-03	5.00e-06	2.00e-04	5.00e-06
Pa	2.50e-03	5.00e-06	8.00e+02	5.00e-06
U	2.50e-03	5.00e-04	3.40e-04	5.00e-04
Np	2.50e-03	5.00e-06	2.00e-04	5.00e-06
Pu	2.50e-04	2.00e-06	1.40e-05	2.00e-06
Am	2.50e-04	5.00e-06	2.00e-04	5.00e-06
Cm	2.50e-03	5.00e-06	2.00e-04	5.00e-06
Bk	2.50e-03	5.00e-06	2.00e-04	5.00e-06
Cf	2.50e-03	5.00e-06	2.00e-04	5.00e-06
Es	2.50e-03	5.00e-06	2.00e-04	5.00e-06
Fm	2.50e-03	5.00e-06	2.00e-04	5.00e-06

Units for transfer data are derived as follows:

Biv -> pCi/kg in vegetation per pCi/kg in soil (no units),

Fm -> pCi/liter in milk per pCi/day ingested by animal (days/liter),

Ff -> pCi/kg in meat per pCi/day ingested by animal (days/kg).

# SPECIFIC FACTORS USED TO DETERMINE $A_i$ , $P_i$ , $R_i$ VALUES FOR THE OFFSITE DOSE CALCULATION MANUAL

Bioaccumulation Factors for Aquatic Organisms by element.  
Waterford Steam Electric Station

Element	Bioaccumulation Factors			
	Fresh Water Fish	Fresh Water Invert.	Salt Water Fish	Salt Water Invert.
H	9.00e-01	9.00e-01	9.00e-01	9.30e-01
He	1.00e+00	1.00e+00	1.00e+00	1.00e+00
Li	5.00e-01	4.00e+01	5.00e-01	5.00e-01
Be	2.00e+00	1.00e+01	2.00e+02	2.00e+02
B	2.20e-01	5.00e+01	2.20e-01	4.40e-01
C	4.60e+03	9.10e+03	1.80e+03	1.40e+03
N	1.50e+05	1.50e+05	6.00e+04	1.70e+04
O	9.20e-01	9.20e-01	9.60e-01	9.60e-01
F	1.00e+01	1.00e+02	3.60e+00	3.60e+00
Ne	1.00e+00	1.00e+00	1.00e+00	1.00e+00
Na	1.00e+02	2.00e+02	6.70e-02	1.90e-01
Mg	5.00e+01	1.00e+02	7.70e-01	7.70e-01
Al	1.00e+01	6.30e+01	1.00e+01	6.00e+01
Si	2.50e+00	2.50e+01	1.00e+01	3.30e+01
P	1.00e+05	2.00e+04	2.90e+04	3.00e+04
S	7.50e+02	1.00e+02	1.70e+00	4.40e-01
Cl	5.00e+01	1.00e+02	1.30e-02	1.90e-02
Ar	1.00e+00	1.00e+00	1.00e+00	1.00e+00
K	1.00e+03	8.30e+02	1.10e+01	6.60e+00
Ca	4.00e+01	3.30e+02	5.00e-01	1.30e+01
Sc	2.00e+00	1.00e+03	2.00e+00	1.00e+04
Ti	1.00e+03	3.00e+03	1.00e+03	1.00e+03
V	1.00e+01	3.00e+03	1.00e+01	5.00e+01
Cr	2.00e+02	2.00e+03	4.00e+02	2.00e+03
Mn	4.00e+02	9.00e+04	5.50e+02	4.00e+02
Fe	1.00e+02	3.20e+03	3.00e+03	2.00e+04
Co	5.00e+01	2.00e+02	1.00e+02	1.00e+03
Ni	1.00e+02	1.00e+02	1.00e+02	2.50e+02
Cu	5.00e+01	4.00e+02	6.70e+02	1.70e+03
Zn	2.00e+03	1.00e+04	2.00e+03	5.00e+04
Ga	3.30e+02	6.70e+02	3.30e+02	6.70e+02
Ge	3.30e+03	3.30e+01	3.30e+03	1.70e+04
As	1.00e+02	4.00e+01	3.30e+02	3.30e+02
Se	1.70e+02	1.70e+02	4.00e+03	1.00e+03
Br	4.20e+02	3.30e+02	1.50e-02	3.10e+00
Kr	1.00e+00	1.00e+00	1.00e+00	1.00e+00
Rb	2.00e+03	1.00e+03	8.30e+00	1.70e+01

Bioaccumulation factors in units of pCi/kg per pCi/liter.



# SPECIFIC FACTORS USED TO DETERMINE $A_i$ , $P_i$ , $R_i$ VALUES FOR THE OFFSITE DOSE CALCULATION MANUAL

Bioaccumulation Factors for Aquatic Organisms by element.  
Waterford Steam Electric Station

Element	Bioaccumulation Factors			
	Fresh Water Fish	Fresh Water Invert.	Salt Water Fish	Salt Water Invert.
Sr	3.00e+01	1.00e+02	2.00e+00	2.00e+01
Y	2.50e+01	1.00e+03	2.50e+01	1.00e+03
Zr	3.30e+00	6.70e+00	2.00e+02	8.00e+01
Nb	3.00e+02	1.00e+02	3.00e+04	1.00e+02
Mo	1.00e+01	1.00e+01	1.00e+01	1.00e+01
Tc	1.50e+01	5.00e+00	1.00e+01	5.00e+01
Ru	1.00e+01	3.00e+02	3.00e+00	1.00e+03
Rh	1.00e+01	3.00e+02	1.00e+01	2.00e+03
Pd	1.00e+01	3.00e+02	1.00e+01	2.00e+03
Ag	2.30e+00	7.70e+02	3.30e+03	3.30e+03
Cd	2.00e+02	2.00e+03	3.00e+03	2.50e+05
In	1.00e+05	1.00e+05	1.00e+05	1.00e+05
Sn	3.00e+03	1.00e+03	3.00e+03	1.00e+03
Sb	1.00e+00	1.00e+01	4.00e+01	5.00e+00
Te	4.00e+02	6.10e+03	1.00e+01	1.00e+02
I	1.50e+01	5.00e+00	1.00e+01	5.00e+01
Xe	1.00e+00	1.00e+00	1.00e+00	1.00e+00
Cs	2.00e+03	1.00e+03	4.00e+01	2.50e+01
Ba	4.00e+00	2.00e+02	1.00e+01	1.00e+02
La	2.50e+01	1.00e+03	2.50e+01	1.00e+03
Ce	1.00e+00	1.00e+03	1.00e+01	6.00e+02
Pr	2.50e+01	1.00e+03	2.50e+01	1.00e+03
Nd	2.50e+01	1.00e+03	2.50e+01	1.00e+03
Pm	2.50e+01	1.00e+03	2.50e+01	1.00e+03
Sm	2.50e+01	1.00e+03	2.50e+01	1.00e+03
Eu	2.50e+01	1.00e+03	2.50e+01	1.00e+03
Gd	2.50e+01	1.00e+03	2.50e+01	1.00e+03
Tb	2.50e+01	1.00e+03	2.50e+01	1.00e+03
Dy	2.50e+01	1.00e+03	2.50e+01	1.00e+03
Ho	2.50e+01	1.00e+03	2.50e+01	1.00e+03
Er	2.50e+01	1.00e+03	2.50e+01	1.00e+03
Tm	2.50e+01	1.00e+03	2.50e+01	1.00e+03
Yb	2.50e+01	1.00e+03	2.50e+01	1.00e+03
Lu	2.50e+01	1.00e+03	2.50e+01	1.00e+03
Hf	3.30e+00	6.70e+00	2.00e+02	2.00e+01
Ta	3.00e+04	6.70e+02	3.00e+04	1.70e+04
W	1.20e+03	1.00e+01	3.00e+01	3.00e+01

Bioaccumulation factors in units of pCi/kg per pCi/liter.

SPECIFIC FACTORS USED TO DETERMINE  $A_i$ ,  $P_i$ ,  $R_i$ , VALUES FOR THE  
OFFSITE DOSE CALCULATION MANUAL

Bioaccumulation Factors for Aquatic Organisms by element.  
Waterford Steam Electric Station

Element	Bioaccumulation Factors			
	Fresh Water Fish	Fresh Water Invert.	Salt Water Fish	Salt Water Invert.
Re	1.20e+02	6.00e+01	4.80e+00	6.00e+01
Os	1.00e+01	3.00e+02	1.00e+01	2.00e+03
Ir	1.00e+01	3.00e+02	1.00e+01	2.00e+03
Pt	1.00e+02	3.00e+02	1.00e+02	2.00e+03
Au	3.30e+01	5.00e+01	3.30e+01	3.30e+01
Hg	1.00e+03	1.00e+05	1.70e+03	3.30e+04
Tl	1.00e+04	1.50e+04	1.00e+04	1.50e+04
Pb	1.00e+02	1.00e+02	3.00e+02	1.00e+03
Bi	1.50e+01	2.40e+01	1.50e+01	2.40e+01
Po	5.00e+02	2.00e+04	3.00e+02	5.00e+03
At	1.50e+01	5.00e+00	1.00e+01	5.00e+01
Rn	1.00e+00	1.00e+00	1.00e+00	1.00e+00
Fr	4.00e+02	1.00e+02	3.00e+01	2.00e+01
Ra	5.00e+01	2.50e+02	5.00e+01	1.00e+02
Ac	2.50e+01	1.00e+03	2.50e+01	1.00e+03
Th	3.00e+01	5.00e+02	1.00e+04	2.00e+03
Pa	1.10e+01	1.10e+02	1.00e+01	1.00e+01
U	2.00e+00	6.00e+01	1.00e+01	1.00e+01
Np	1.00e+01	4.00e+02	1.00e+01	1.00e+01
Pu	3.50e+00	1.00e+02	3.00e+00	2.00e+02
Am	2.50e+01	1.00e+03	2.50e+01	1.00e+03
Cm	2.50e+01	1.00e+03	2.50e+01	1.00e+03
Bk	2.50e+01	1.00e+03	2.50e+01	1.00e+03
Cf	2.50e+01	1.00e+03	2.50e+01	1.00e+03
Es	1.00e+01	1.00e+02	1.00e+01	1.00e+01
Fm	1.00e+01	1.00e+02	1.00e+01	1.00e+01

Bioaccumulation factors in units of pCi/kg per pCi/liter.

SPECIFIC FACTORS USED TO DETERMINE  $A_i$ ,  $P_i$ ,  $R_i$ , VALUES FOR THE  
OFFSITE DOSE CALCULATION MANUAL

Site Specific Parameters used.

Parameter No.	: 1
Description	: fraction of ingested produce grown in region
Formula Symbol	: fg
Value	: 0.760
Units	: none
Parameter No.	: 2
Description	: fraction of leafy vegetables grown in region
Formula Symbol	: fL
Value	: 1.000
Units	: none
Parameter No.	: 4
Description	: fraction of activity retained on crops for airborne particulates
Formula Symbol	: r
Value	: 0.200
Units	: none
Parameter No.	: 5
Description	: fraction of activity retained on crops for airborne radioiodines
Formula Symbol	: r
Value	: 1.000
Units	: none
Parameter No.	: 6
Description	: building shielding factor for maximum individuals
Formula Symbol	: SF
Value	: 0.700
Units	: none
Parameter No.	: 11
Description	: period of long term buildup of activity in soil or sediment
Formula Symbol	: t
Value	: 131400.000
Units	: hr
Parameter No.	: 12
Description	: transport time from animal feed-milk-man max individuals
Formula Symbol	: tf
Value	: 2.000
Units	: days
Parameter No.	: 15
Description	: time delay for harvest of veg/crops and ingestion by animals - stored feed
Formula Symbol	: th
Value	: 2160.000
Units	: hr

# SPECIFIC FACTORS USED TO DETERMINE $A_i$ , $P_i$ , $R_i$ , VALUES FOR THE OFFSITE DOSE CALCULATION MANUAL

Paramater No.	: 16
Description	: time delay for harvest of veg/crops and ingestion by man - leafy veg max indivd
Formula Symbol	: tL
Value	: 24.000
Units	: hr
Paramater No.	: 17
Description	: time delay for harvest of veg/crops and ingestion by man - produce veg max ind
Formula Symbol	: th
Value	: 1440.000
Units	: hr
Paramater No.	: 37
Description	: agricultural productivity by unit area stored feed feed-animal-man
Formula Symbol	: Ys
Value	: 2.000
Units	: kg/m2
Paramater No.	: 38
Description	: agricultural productivity by unit area pasture grass feed-animal-man
Formula Symbol	: Yp
Value	: 0.700
Units	: kg/m2
Paramater No.	: 41
Description	: time from slaughter of meat animal to consumption
Formula Symbol	: tf
Value	: 20.000
Units	: days
Paramater No.	: 43
Description	: agricultural productivity by unit area crops/veg-man
Formula Symbol	: Yv
Value	: 2.000
Units	: kg/m2
Paramater No.	: 44
Description	: rate constant for removal of activity on plants by weathering
Formula Symbol	: lambda-w
Value	: 2.062938e-3
Units	: hr-1
Paramater No.	: 69
Description	: fraction of year that milk cows are on pasture
Formula Symbol	: fp
Value	: 1.000
Units	: none

SPECIFIC FACTORS USED TO DETERMINE  $A_i$ ,  $P_i$ ,  $R_i$ , VALUES FOR THE  
OFFSITE DOSE CALCULATION MANUAL

Paramater No. : 70  
Description : fraction of year that milk goats are on pasture  
Formula Symbol : fp  
Value : 1.000  
Units : none

Paramater No. : 71  
Description : fraction of year that beef cows are on pasture  
Formula Symbol : fp  
Value : 1.000  
Units : none

Paramater No. : 73  
Description : fraction of milk cow's intake from pasture  
Formula Symbol : fs  
Value : 1.000  
Units : none

Paramater No. : 74  
Description : fraction of milk goat's intake from pasture  
Formula Symbol : fs  
Value : 1.000  
Units : none

Paramater No. : 75  
Description : fraction of beef cow's intake from pasture  
Formula Symbol : fs  
Value : 1.000  
Units : none

Paramater No. : 88  
Description : absolute relative humidity in the atmosphere  
Formula Symbol : H  
Value : 8.000  
Units : g/m3

ODCM SPECIFICATIONS CONTAINED IN THE  
WATERFORD III TECHNICAL REQUIREMENTS MANUAL

TRM SPECIFICATION	TRM TABLE OR SECTION	DESCRIPTION
3.11.1.1	Section 3/4.11.1	Liquid Effluents - Concentration
4.11.1.1.1	Table 4.11-1	Radioactive Liquid Waste Sampling and Analysis Program
3.11.1.2	Section 3/4.11.1	Liquid Effluents - Dose
3.11.1.3	Section 3/4.11.1	Liquid Radwaste Treatment System
3.11.2.1	Section 3/4.11.2	Gaseous Effluents - Dose Rate
4.11.2.1.2	Table 4.11-2	Radioactive Gaseous Waste Sampling and Analysis Program
3.11.2.2	Section 3/4.11.2	Gaseous Effluents - Dose Rate (Noble Gases)
3.11.2.3	Section 3/4.11.2	Gaseous Effluents - Dose Rate (I-131, I-133, Tritium and Particulates)
3.11.2.4	Section 3/4.11.2	Gaseous Radwaste Treatment
3.11.4	Section 3/4.11.4	Total Dose
3.3.3.10	Section 3/4.3.3	Radioactive Liquid Effluent Monitoring Instrumentation
4.3.3.10	Table 3.3-12	Radioactive Liquid Effluent Monitoring Instrumentation
3.3.3.11	Section 3/4.3.3	Radioactive Gaseous Effluent Monitoring Instrumentation
4.3.3.11	Table 3.3-12	Radioactive Gaseous Effluent Monitoring Instrumentation
3.12.1	Section 3/4.12.1	Radiological Environmental Monitoring Program
3.12.1	Table 3.12-1	Radiological Environmental Monitoring Program
3.12.2	Table 3.12-2	Reporting Levels For Radioactivity Concentrations in Environmental Samples
3.12.2	Table 4.12-1	Detection Capabilities For Environmental Sample Analysis Lower Limits of Detection
3.12.2	Section 3/4.12.2	Land Use Census
3.12.3	Section 3/4.12.3	Interlaboratory Comparison Program
3/4.3.3.10	Section 3/4.3	Radioactive Liquid Effluent Monitoring Instrumentation Basis
3/4.3.3.11	Section 3/4.3	Radioactive Gaseous Effluent Monitoring Instrumentation Basis
3/4.11.1.1	Section 3/4.11	Liquid Effluents Concentration Basis
3/4.11.1.2	Section 3/4.11	Liquid Effluents Dose Basis
3/4.11.1.3	Section 3/4.11	Liquid Radwaste Treatment System Basis
3/4.11.2.1	Section 3/4.11	Gaseous Effluents Dose Rate Basis
3/4.11.2.2	Section 3/4.11	Gaseous Effluents Dose - Noble Gases Basis
3/4.11.2.3	Section 3/4.11	Gaseous Effluents Dose - I-131, I-133, Tritium and Particulates Basis
3/4.11.2.4	Section 3/4.11	Gaseous Radwaste Treatment System Basis
3/4.11.4	Section 3/4.11	Total Dose Basis
3/4.12.1	Section 3/4.12	Radiological Environmental Monitoring Program Basis
3/4.12.2	Section 3/4.12	Land Use Census Basis
3/4.12.3	Section 3/4.12	Interlaboratory Comparison Program Basis

**ATTACHMENT 11.2**

**Copy of**

**Applicable Technical Requirements Manual (TRM) Sections**

→ (DRN 02-216)

### 3/4.3 INSTRUMENTATION (See note below)

← (DRN 02-216)

### 3/4.3.3 MONITORING INSTRUMENTATION

#### 3/4.3.3.10 RADIOACTIVE LIQUID EFFLUENT

##### LIMITING CONDITION FOR OPERATION

3.3.3.10 The radioactive liquid effluent monitoring instrumentation channels shown in Table 3.3-12 shall be OPERABLE with their alarm/trip setpoints set to ensure that the limits of Requirement 3.11.1.1 are not exceeded during releases to the environment. The alarm/trip setpoints of these channels shall be determined and adjusted in accordance with the methodology and parameters in the Offsite Dose Calculation Manual (ODCM).

APPLICABILITY: At all times.

##### ACTION:

- a. With radioactive liquid effluent monitoring instrumentation channel alarm/trip setpoint less conservative than required by the above Requirement, immediately suspend release to the environment of radioactive liquid effluents monitored by the affected channel, or declare the channel inoperable, or change the setpoint so it is acceptably conservative.
- b. With less than the minimum number of radioactive liquid effluent monitoring instrumentation channels OPERABLE, take the ACTION shown in Table 3.3-12. Restore the inoperable instrumentation to OPERABLE status within 30 days if release to the environment are in progress or, if unsuccessful, explain in the next Annual Radioactive Effluent Release Report, pursuant to Technical Specification 6.9.1.8, why this inoperability was not corrected within the time specified. Releases need not be terminated after 30 days provided the specified ACTIONS are continued.

##### SURVEILLANCE REQUIREMENT

4.3.3.10 Each radioactive liquid effluent monitoring instrumentation channel shall be demonstrated OPERABLE by performance of the CHANNEL CHECK, SOURCE CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST at the frequencies shown in Table 4.3-8.

→ (DRN 02-216)

NOTE: TRM Specifications 3.3.3.10 and 4.3.3.10 are part of the Offsite Dose Calculation Manual (ODCM), reference UNT-005-014. Revision of these TRM Specifications requires the approval of the General Manager Plant Operations (GMPO) in accordance with Technical Specification 6.14.

← (DRN 02-216)



→ (DRN 02-216)  
**TABLE 3.3-12 (See note below)**  
 ← (DRN 02-216)

**RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION**

<b><u>INSTRUMENT</u></b>	<b><u>MINIMUM CHANNELS OPERABLE</u></b>	<b><u>RELEASE INFORMATION</u></b>	<b><u>ACTION</u></b>
<b>1. BORON WASTE MANAGEMENT SYSTEM (BWMS):</b>			
a. Radioactivity Monitor Providing Alarm and Automatic Termination of Release (PRM-IRE-0627)	1	Batch Release from Boric Acid	1
b. Waste (Process) Flow Rate Measurement Device (BM-IFT-0627)	1	Condensate Tanks	2
<b>2. LIQUID WASTE MANAGEMENT SYSTEM DISCHARGE (LWMS):</b>			
a. Radioactivity Monitor Providing Alarm and Automatic Termination of Release (PRM-IRE-0647)	1	Batch Release from Liquid Waste	1
b. Waste (Process) Flow Rate Measurement Device (LWM-IFT-0647)	1	Management Tanks	2 : .

→ (DRN 02-216)

NOTE: TRM Table 3.3-12 is part of the Offsite Dose Calculation Manual (ODCM), reference UNT-005-014. Revision of this TRM Table requires the approval of the General Manager Plant Operations (GMPO) in accordance with Technical Specification 6.14.

← (DRN 02-216)

→ (DRN 02-216)

**TABLE 3.3-12 (Continued, See note below)**

← (DRN 02-216)

**RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION**

<b><u>INSTRUMENT</u></b>	<b><u>MINIMUM CHANNELS OPERABLE</u></b>	<b><u>RELEASE INFORMATION</u></b>	<b><u>ACTION</u></b>
<b>3. DRY COOLING TOWER SUMPS (DCTS):</b>			
a. Radioactivity Monitor Providing Alarm and Automatic Termination of Release [PRM-IRE-6775 (DCTS#1) and PRM-IRE-6776(DCTS#2)]	1/sump	Release Path is <u>NOT Aligned</u> to LWMS (see Note #2)	3
b. Waste (Process) Flow Rate Measurement Device (See Table Note. #1)	N/A		N/A
<b>4. INDUSTRIAL WASTE SUMP TURBINE BUILDING (TBIWS):</b>			
a. Radioactivity Monitor Providing Alarm and Automatic Termination of Release (PRM-IRE-6778)	1	Release Path is <u>NOT Aligned</u> to LWMS (see Note #2)	3
b. Waste (Process) Flow Rate Measurement Device (See Table Note. #1)	N/A		N/A

→ (DRN 02-216)

NOTE: TRM Table 3.3-12 is part of the Offsite Dose Calculation Manual (ODCM), reference UNT-005-014. Revision of this TRM Table requires the approval of the General Manager Plant Operations (GMPO) in accordance with Technical Specification 6.14.

← (DRN 02-216)

→ (DRN 02-216)

**TABLE 3.3-12 (Continued, See note below)**

← (DRN 02-216)

**RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION**

<b><u>INSTRUMENT</u></b>	<b><u>MINIMUM CHANNELS OPERABLE</u></b>	<b><u>RELEASE INFORMATION</u></b>	<b><u>ACTION</u></b>
<b>5. CIRCULATING WATER DISCHARGE (CWD) - BLOWDOWN AND BLOWDOWN HEAT EXCHANGER DISCHARGES AND AUXILIARY COMPONENT COOLING WATER PUMPS:</b>			
a. Radioactivity Monitor Providing Alarm and initiate Automatic Closure of Blowdown Valve BD-303 (PRM-IRE-1900)	1	1. Detectable Activity in Secondary Plant 2. During Blowdown of Steam Generators to CW System. 3. During Discharge of ACCW Basins to CW System	4
b. Waste (Process) Flow Rate Measurement Device (See Table Note. #1)	N/A		N/A
<b>6. STEAM GENERATOR BLOWDOWN (SGB) EFFLUENT LINE</b>			
a. Continuous Composite Sampler	1	During Blowdown Of S / Gs to CW System or Metal Waste Ponds (see Note #3)	4

→ (DRN 02-216)

NOTE: TRM Table 3.3-12 is part of the Offsite Dose Calculation Manual (ODCM), reference UNT-005-014. Revision of this TRM Table requires the approval of the General Manager Plant Operations (GMPO) in accordance with Technical Specification 6.14.

← (DRN 02-216)

→ (DRN 02-216)  
TABLE 3.3-12 (Continued, See note below)  
← (DRN 02-216)

TABLE NOTATIONS

- NOTE #1 Waste (process) Flow Measurement Devices are not installed on the release paths for the DCTS, TBIWS or CWD monitors. For these release paths, pump performance curves generated in place or some form of volumetric estimate or measurement device may be used for effluent flow rate estimates.
- NOTE #2 DCTS and TBIWS monitor operation should be maximized during releases to the environment, even when detectable activity is not present in the CCW/ACCW or secondary systems, to provide capability for release termination in the event that Primary to Secondary or Primary to CCW leakage occurs.
- NOTE #3 The Steam Generator Blowdown Composite Sampler is capable of sampling blowdown discharge to either the CW System or Waste Ponds. Blowdown to the Waste Ponds is not allowed unless radiation monitoring capable of release termination is added to the release path.

ACTION STATEMENTS

- ACTION 1 With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement effluent releases via this pathway may continue provided best efforts are made to repair the instrument and that prior to initiating a release:
- a. At least two independent samples are analyzed in accordance with Requirement 4.11.1.1 and
  - b. At least two technically qualified members of the Facility Staff independently verify the release rate calculations and discharge valve lineup.
- ACTION 2 With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via this pathway may continue provided best efforts are made to repair the instrument and that the flow rate is estimated at least once per FOUR hours during actual releases. Pump performance curves generated in place may be used to estimate flow.

→ (DRN 02-216)

NOTE: TRM Table 3.3-12 is part of the Offsite Dose Calculation Manual (ODCM), reference UNT-005-014. Revision of this TRM Table requires the approval of the General Manager Plant Operations (GMPO) in accordance with Technical Specification 6.14.

← (DRN 02-216)

→ (DRN 02-216)

TABLE 3.3-12 (Continued, See note below)

← (DRN 02-216)

ACTION STATEMENTS

- ACTION 3** With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via this pathway may continue provided best efforts are made to repair the instrument and that grab samples are collected and are analyzed within 24 hours of collection time for radioactivity at a lower limit of detection of at least  $5 \text{ E-}07$  microcurie/ml. Sample collection and analysis is NOT required if the release path for the DCTS/TBIWS is aligned to the LWMS. The sample collection frequency is:
- a. At least once per 12 hours when the specific activity of the secondary coolant is greater than 0.01 microcurie/gram DOSE EQUIVALENT I-131, or
  - b. At least once per 24 hours when the specific activity of the secondary coolant is less than or equal to 0.01 microcurie/gram DOSE EQUIVALENT I-131.
- ACTION 4** With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via this pathway may continue provided best efforts are made to repair the instrument and that grab samples are collected and are analyzed within 24 hours of collection time for radioactivity at a lower limit of detection of at least  $5 \text{ E-}07$  microcurie/ml. Sample collection and analysis is NOT required if no detectable activity exists in either the secondary plant or CCW/ACCW systems. Sampling of Steam Generator Blowdown is required during blowdown to the CW System or Waste Ponds. The sample collection frequency is:
- a. At least once per 12 hours when the specific activity of the secondary coolant is greater than 0.01 microcurie/gram DOSE EQUIVALENT I-131, or
  - b. At least once per 24 hours when the specific activity of the secondary coolant is less than or equal to 0.01 microcurie/gram DOSE EQUIVALENT I-131.

→ (DRN 02-216)

NOTE: TRM Table 3.3-12 is part of the Offsite Dose Calculation Manual (ODCM), reference UNT-005-014. Revision of this TRM Table requires the approval of the General Manager Plant Operations (GMPO) in accordance with Technical Specification 6.14.

← (DRN 02-216)

TABLE 4.3-8

RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>INSTRUMENT</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL SOURCE CHECK</u>	<u>CHANNEL CALIBRATION</u>	<u>FUNCTIONAL TEST</u>	<u>RELEASE INFORMATION</u>
<b>1. BORON WASTE MANAGEMENT SYSTEM DISCHARGE (BWMS):</b>					
a. Radioactivity Monitor Providing Alarm and Automatic Termination of Release (PRM-IRE-0627)	Prior to Release (6)	Prior to Release (6)	18 Months (3)	Quarterly (1)	Batch Release from Boric Acid Condensate Tanks
b. Waste (Process) Flow Rate Measurement Device. (BM-IFT-0627)	Daily (4)	N/A	18 Months		
<b>2. LIQUID WASTE MANAGEMENT SYSTEM DISCHARGE (LWMS):</b>					
a. Radioactivity Monitor Providing Alarm and Automatic Termination of Release (PRM-IRE-0647)	Prior to Release (6)	Prior to Release (6)	18 Months (3)	Quarterly (1)	Batch Release from Liquid Waste Management Tanks
b. Waste (Process) Flow Rate Measurement Device (LWM-IFT-0647)	Daily (4)	N/A	18 Months		
<b>3. DRY COOLING TOWER SUMPS (DCTS):</b>					
a. Radioactivity Monitor Providing Alarm and Automatic Termination of Release (PRM-IRE-6775 and PRM-IRE-6776)	Daily	Monthly	18 Months (3)	Quarterly (2)	Release Path is <u>NOT Aligned</u> to LWMS
b. Waste (Process) Flow Rate Measurement	N/A	N/A	N/A	N/A	

TABLE 4.3-8 (Continued)

RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>INSTRUMENT</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL SOURCE CHECK</u>	<u>CHANNEL CALIBRATION</u>	<u>FUNCTIONAL TEST</u>	<u>RELEASE INFORMATION</u>
<b>4. INDUSTRIAL WASTE SUMPS TURBINE BUILDING (IWSTB):</b>					
a. Radioactivity Monitor Providing Alarm and Automatic Termination of Release (PRM-IRE-6778)	Daily	Monthly	18 Months (3)	Quarterly (2)	Release Path is <u>NOT Aligned</u> to LWMS
b. Waste (Process) Flow Rate Measurement	N/A	N/A	N/A	N/A	
<b>5. CIRCULATING WATER DISCHARGE (CWD) BLOWDOWN AND BLOWDOWN HEAT EXCHANGER DISCHARGE AND AUXILIARY COMPONENT COOLING WATER PUMPS: (TERMINATION OF BLOWDOWN DISCHARGE ONLY)</b>					
a. Radioactivity Monitor Providing Alarm and initiate Automatic Closure of Blowdown Discharge Valve BD-303	Daily	Monthly	18 Months (3)	Quarterly (2)	1. Steam Generators Blowdown to CW System 2. Discharge of ACCW Basins to CW System :
b. Waste (Process) Flow Rate Measurement	N/A	N/A	N/A	N/A	
<b>6. STEAM GENERATOR BLOWDOWN (SGB) EFFLUENT LINE:</b>					
a. Continuous Composite Sampler	Daily (5)	N/A	18 Months	Quarterly	Blowdown of S/Gs to CW System or Metal Waste Ponds

TABLE 4.3-8 (Continued)

TABLE NOTATIONS

1. The CHANNEL FUNCTIONAL TEST for BWM and LWM shall also demonstrate that automatic isolation of this pathway and control room alarm annunciation occur if any of the following conditions exists.
  - a. Instrument indicates measured levels above the alarm/trip setpoint.
  - b. Circuit failure.
  - c. Instrument indicates a downscale failure.
2. The CHANNEL FUNCTIONAL TEST for DCTS, TBIWS and CWD shall also demonstrate that automatic isolation of this pathway occurs if the instrument indicates measured levels above the alarm/trip setpoint and that control room alarm annunciation occurs if any of the following conditions exists:
  - a. Instrument indicates measured levels above the alarm setpoint.
  - b. Circuit failure.
  - c. Instrument controls not set in operate mode.
3. The initial CHANNEL CALIBRATION shall be performed using one or more of the reference standards certified by the National Institute of Standards and Technology NIST or using standards that have been obtained from suppliers that participate in measurement assurance activities with NIST. These standards shall permit calibrating the system for over its intended range of energy and measurement range. For subsequent CHANNEL CALIBRATION, sources that have been related to the initial calibration may be used in lieu of the reference standards associated with the initial calibration.
4. CHANNEL CHECK for BWM and LWM shall consist of verifying indication of flow during periods of release. CHANNEL CHECK shall be made at least once per 24 hours on days on which continuous, periodic, or batch releases are made.
5. CHANNEL CHECK for Steam Generator Blowdown Composite Sampler shall be made at least once per 24 hours on days on which releases are made to the Circulating Water System or Waterford 3 waste pond.
6. CHANNEL CHECK for BWM and LWM shall consist of observing a satisfactory channel source check which is also performed prior to the release.



→ (DRN 02-216)

### 3/4.3 INSTRUMENTATION (See note below)

← (DRN 02-216)

### 3/4.3.3 MONITORING INSTRUMENTATION

#### 3/4.3.3.11 RADIOACTIVE GASEOUS EFFLUENT

##### LIMITING CONDITION FOR OPERATION

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3.3.3.11 The radioactive gaseous effluent monitoring instrumentation channels shown in Table 3.3-13 shall be OPERABLE with their alarm/trip setpoints set to ensure that the limits of Requirement 3.11.2.1 are not exceeded during releases to the environment. The alarm/trip setpoints of these channels shall be determined and adjusted in accordance with the methodology and parameters in the Offsite Dose Calculation Manual (ODCM).

APPLICABILITY: As shown in Table 3.3-13

ACTION:

- a. With a radioactive gaseous effluent monitoring instrumentation channel alarm/trip setpoint less conservative than required by the above Specification, immediately suspend release to the environment of radioactive gaseous effluents monitored by the affected channel, or declare the channel inoperable, or change the setpoint so it is acceptably conservative.
- b. With less than the minimum number of radioactive gaseous effluent monitoring instrumentation channels OPERABLE, take the ACTION shown in Table 3.3-13. Restore the inoperable instrumentation to OPERABLE status within 30 days if releases to the environment are in progress or, if unsuccessful, explain in the next Annual Radioactive Effluent Release Report, pursuant to Technical Specification 6.9.1.8, why this inoperability was not corrected within the time specified. Releases need not be terminated after 30 days provided the specified ACTIONS are continued.

##### SURVEILLANCE REQUIREMENTS

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4.3.3.11 Each radioactive gaseous effluent monitoring instrumentation channel shall be demonstrated OPERABLE by performance of the CHANNEL CHECK, SOURCE CHECK, CHANNEL CALIBRATION, and CHANNEL FUNCTIONAL TEST at the frequencies shown in Table 4.3-9.

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→ (DRN 02-216)

NOTE: TRM Specifications 3.3.3.11 and 4.3.3.11 are part of the Offsite Dose Calculation Manual (ODCM), reference UNT-005-014. Revision of these TRM Specifications requires the approval of the General Manager Plant Operations (GMPO) in accordance with Technical Specification 6.14.

← (DRN 02-216)

TABLE 3.3-13

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

<u>INSTRUMENT</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>APPLICABILITY</u>	<u>ACTION</u>
<b>1. GASEOUS WASTE MANAGEMENT SYSTEM (GWMS):</b>			
a. Noble Gas Activity Monitor Providing Alarm and Automatic Termination of Release (PRM-IRE-0648)	1	Batch Release from Waste Gas	1
b. Waste (Process) Flow Rate Measurement Device (GWM-IFT-0648)	1	Decay Tank	5
<b>2. CONDENSER VACUUM PUMPS - MAIN CONDENSER EVACUATION (MCES) AND TURBINE GLAND SEALING SYSTEM:</b>			
a. Noble Gas Activity Monitor (PRM-IRE-0002)	1	Main Condenser is	3
b. Iodine Sampler (see NOTE 1)	1	Under a vacuum	4
c. Particulate Sampler (see NOTE 1).	1		4
d. Sampler Flow Rate Monitor (see NOTE 1)	1		6

TABLE 3.3-13 (Continued)

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

<u>INSTRUMENT</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>APPLICABILITY</u>	<u>ACTION</u>
<b>3. REACTOR AUXILIARY BUILDING VENTILATION SYSTEM (PLANT STACK):</b>			
a1. Noble Gas Activity Monitor Providing Alarm and Automatic Termination Containment Purge (PRM-IRE-0100.1S & 2S)	1	Containment Purge	2
a2. Noble Gas Activity Monitor (PRM-IRE-0100.1S, 2S or 0110)	1	At All Times	3
b. Iodine Sampler (see NOTE 1)	1	At All Times	4
c. Particulate Sampler (see NOTE 1)	1	At All Times	4
d. Sampler Flow Rate Monitor (see NOTE 1)	1	At All Times	6
e. Waste (Process) Flow Rate Monitor (PRM-IFT-0100-12/22)	1	At All Times	5
<b>4. FUEL HANDLING BUILDING VENTILATION SYSTEM - (NORMAL EXHAUST):</b>			
a. Noble Gas Activity Monitor (PRM-IRE-5107 A or B)	1	With	3
b. Iodine Sampler (see NOTE 1)	1	Irradiated	4
c. Particulate Sampler (see NOTE 1)	1	Fuel in	4
d. Sampler Flow Rate Monitor (see NOTE 1)	1	the Storage	6
e. Waste (Process) Flow Rate Monitor (PRM-IFT-5107 A or B)	1	Pool	5

TABLE 3.3-13 (Continued)

TABLE NOTATIONS

NOTE 1 The sampler flow rate monitor operability also satisfies the particulate and Iodine sampler requirements as long as the filter media for the applicable sample pump is installed. For the MCES and Plant Stack WRGM's, the low range detector sample pump is normally used to satisfy these requirements. For the Plant Stack and Fuel Handling Building PIG'S, the filter media necessary to satisfy the particulate and Iodine sampler is normally applicable to the Iodine/gas channel sample pump.

ACTION STATEMENTS

- ACTION 1 With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, the contents of the tank(s) may be released to the environment provided best efforts are made to repair the instrument and that prior to initiating the release:
- a. At least two independent samples of the tank's contents are analyzed, and
  - b. At least two technically qualified members of the facility staff independently verify the release rate calculations and discharge valve lineup.
- ACTION 2 With the number of channels operable less than required, containment purging of radioactive effluents must be immediately suspended. This ACTION only applies to the noble gas channels of the Plant Stack PIG's (PRM-IRE-0100.1S and PRM-IRM-0100.2S).
- ACTION 3 With the number of Noble Gas activity monitor Channels OPERABLE less than the minimum channels OPERABLE requirement, effluent releases via this pathway may continue provided best efforts are made to repair the instrument and that grab samples are taken at least once per 12 hours and these samples are analyzed for gross activity within 24 hours. For the Main Condenser Evacuation and Turbine Gland Sealing Systems (MCES), this ACTION only applies during releases with Turbine Gland Sealing System or Condenser Vacuum Pumps in OPERATION.
- ACTION 4 With the number of Particulate/Iodine Sampler Channels OPERABLE less than the minimum channels OPERABLE requirement, effluent releases via this pathway may continue provided best efforts are made to repair the instrument and that samples are continuously collected with auxiliary sampling equipment as required in Table 4.11-2, within one hour after the channel has been declared inoperable. For the MCES WRGM, this ACTION only applies during periods of Primary to Secondary leakage.

TABLE 3.3-13 (Continued)

TABLE NOTATIONS

- ACTION 5 With the number of Waste (Process) flow rate monitor channels OPERABLE less than the minimum channels OPERABLE requirement, effluent releases via this pathway may continue provided best efforts are made to repair the instrument and that flow rate is estimated at least once every four hours. Waste (Process) flow rate estimates may be in the form of a log of running ventilation equipment which is updated at four hour intervals. For the waste gas holdup tank, this ACTION is applicable only during periods of release.
- ACTION 6 With the number of Sampler Flow Rate Monitor Channels OPERABLE less than the minimum channels OPERABLE requirement, effluent releases via this pathway may continue provided best efforts are made to repair the instrument and flow rate is estimated at least once every four hours. For the MCES WRGM, this ACTION only applies during periods of Primary to Secondary leakage.

TABLE 4.3-9

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>INSTRUMENT</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL SOURCE CHECK</u>	<u>CHANNEL CALIBRATION</u>	<u>CHANNEL FUNCTIONAL TEST</u>	<u>RELEASE INFORMATION</u>
1. GASEOUS WASTE MANAGEMENT SYSTEM (GWMS):					
a. Noble Gas Activity Monitor Providing Alarm and Automatic Termination of Release (PRM-IRE-0648)	Prior to Release(6)	Prior to Release(6)	18 Months (4)	Quarterly (1)	Batch Release from Waste Gas Decay Tank
b. Waste (Process) Flow Rate Measurement Device (GWM-IFT-0648)	Daily (5)	N/A	18 Months	Quarterly	
2. CONDENSER VACUUM PUMPS - MAIN CONDENSER EVACUATION (MCES) AND TURBINE GLAND SEALING SYSTEM (MCES):					
a. Noble Gas Activity Monitor (PRM-IRE-0002)	Daily	Monthly	18 Months (4)	Quarterly (2)	Main Condenser is under a vacuum
b. Iodine Sampler	Weekly	N/A	N/A	N/A	
c. Particulate Sampler	Weekly	N/A	N/A	N/A	
d. Sampler Flow Rate Monitor	Daily	N/A	18 Months	Quarterly	

OTABLE 4.3-9 (Continued)

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>INSTRUMENT</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL SOURCE CHECK</u>	<u>CHANNEL CALIBRATION</u>	<u>CHANNEL FUNCTIONAL TEST</u>	<u>RELEASE INFORMATION</u>
<b>3. REACTOR AUXILIARY BUILDING VENTILATION SYSTEM (PLANT STACK):</b>					
a. Noble Gas Activity Monitor Providing Alarm and Automatic Termination of Release (PRM-IRE-0100.1S or 2S)	Daily	Monthly	18 Months (4)	Quarterly (3)	At
b. Iodine Sampler	Weekly	N/A	N/A	N/A	All
c. Particulate Sampler	Weekly	N/A	N/A	N/A	Times
d. Sampler Flow Rate Monitor	Daily	N/A	18 Months	Quarterly	
e. Waste (Process) Flow Rate Monitor (PRM-IFT-0100-12/22)	Daily	N/A	18 Months	Quarterly	
<b>4. FUEL HANDLING BUILDING VENTILATION SYSTEM - (NORMAL EXHAUST):</b>					
a. Noble Gas Activity Monitor (PRM-IRE-5107 A or B)	Daily	Monthly	18 Months (4)	Quarterly (2)	With
b. Iodine Sampler	Weekly	N/A	N/A	N/A	Irradiated
c. Particulate Sampler	Weekly	N/A	N/A	N/A	Fuel in
d. Sampler Flow Rate Monitor	Daily	N/A	18 Months	Quarterly	the Storage
e. Waste (Process) Flow Rate Monitor (PRM-IFT-5107 A or B)	Daily	N/A	18 Months	Quarterly	Pool

TABLE 4.3-9

TABLE NOTATIONS

1. The CHANNEL FUNCTIONAL TEST for Waste Gas Holdup System shall also demonstrate that automatic isolation of this pathway and control room alarm annunciation occurs if any of the following conditions exists:
  - a. Instrument indicates measured levels above the alarm/trip setpoint.
  - b. Circuit failure.
  - c. Instrument indicates a downscale failure.
2. The CHANNEL FUNCTIONAL TEST for MCES and Fuel Handling Building shall also demonstrate that control room alarm annunciation occurs if any of the following conditions exists:
  - a. Instrument indicates measured levels above the alarm setpoint.
  - b. Circuit failure.
3. The CHANNEL FUNCTIONAL TEST for Plant Stack shall also demonstrate that automatic isolation of this pathway occurs if the instrument indicates measured levels above the alarm/trip setpoint and that control room alarm annunciation occurs if any of the following conditions exists:
  - a. Instrument indicates measured levels above the alarm set.
  - b. Circuit failure.
  - c. Instrument controls not set in operate mode.
4. The initial CHANNEL CALIBRATION shall be performed using one or more of the reference standards certified by the National Institute of Standards and Technology (NIST) or using standards that have been obtained from suppliers that participate in measurement assurance activities with NIST. These standards shall permit calibrating the system over its intended range of energy and measurement range. For subsequent CHANNEL CALIBRATION, sources that have been related to the initial calibration may be used in lieu of the reference standards associated with the initial calibration.
5. CHANNEL CHECK for GWMS shall consist of verifying indication of flow during periods of release. CHANNEL CHECK shall be made at least once per 24 hours on days on which continuous, periodic, or batch releases are made.
6. CHANNEL CHECK for GWMS shall consist of observing a satisfactory channel source check which is also performed prior to the release.