Residential Risks Calculated in RESRAD-BUILD Based on Removable Fractions (1%, 10%, and 20%)
Hunters Point Naval Shipyard Building Surfaces

Risk-Removable Fraction Scenario:		Removal			
		Resident Child Risk[b]			
Isotope[a]	Building Surface RGs (dpm/100 cm^2)	Risk - Floor	Risk - 1 Wall	Risk - 4 Walls	Total Child Risk
AM-241	**100**	1.95E-08	1.05E-08	4.20E-08	6.15E-08
NP-237	---	7.16E-14	3.23E-14	1.29E-13	2.008E-13
U-233	---	3.79E-20	2.40E-20	9.60E-20	1.339E-19
TH-229	---	2.03E-22	1.08E-22	4.32E-22	6.35E-22
PU-239	**100**	1.15E-08	7.42E-09	2.97E-08	4.118E-08
U-235	---	1.56E-16	7.01E-17	2.80E-16	4.364E-16
PA-231	---	3.65E-21	1.99E-21	7.96E-21	1.161E-20
AC-227	---	1.01E-21	5.18E-22	2.07E-21	3.082E-21
U-235	**488**	2.59E-07	1.16E-07	4.64E-07	0.000000723
PA-231	---	9.07E-12	4.96E-12	1.98E-11	2.891E-11
AC-227	---	3.30E-12	1.70E-12	6.80E-12	1.01E-11
TH-232	**36.5**	5.24E-09	3.40E-09	1.36E-08	1.884E-08
TH-228	---	7.05E-08	4.17E-08	1.67E-07	2.373E-07
RA-228	---	2.99E-08	1.31E-08	5.24E-08	8.23E-08
RA-226	**100**	6.63E-07	3.26E-07	1.30E-06	0.000001967
PB-210	---	6.99E-10	4.20E-10	1.68E-09	2.379E-09
EU-154	**5,000**	1.42E-05	6.15E-06	2.46E-05	0.0000388
GD-152	---	2.60E-21	1.70E-21	6.80E-21	9.4E-21
EU-152	**5,000**	1.42E-05	6.16E-06	2.46E-05	0.00003884
CS-137	**5,000**	7.57E-06	3.28E-06	1.31E-05	0.00002069
SR-90	**1,000**	2.05E-08	9.79E-09	3.92E-08	5.966E-08
CO-60	**5,000**	2.42E-05	1.05E-05	4.20E-05	0.0000662
H-3	**5,000**	2.87E-11	1.88E-11	7.52E-11	1.039E-10
				Total Receptor Risk =	**1.68E-04**

Notes:

[a] Isotopes presented in bold are radionuclides of concern (ROCs) for HPNS building structures for which RGs were established. No

[b] Isoptope-specific source risks presented for floor and walls each represent cumulative risks calculated based on the ROC RGs, ov

ɔle Fraction = 1%									Removable
Resident Adult Risk[b]				Total Residential Risk	Resident Child Risk[b]				
Risk - Floor	Risk - 1 Wall	Risk - 4 Walls	Total Adult Risk		Risk - Floor	Risk - 1 Wall	Risk - 4 Walls	Total Child Risk	Risk - Floor
8.90E-08	5.09E-08	2.04E-07	2.93E-07	3.54E-07	1.02E-07	6.49E-08	2.60E-07	3.62E-07	5.89E-07
1.42E-12	6.57E-13	2.63E-12	4.05E-12	4.25E-12	1.22E-13	6.59E-14	2.64E-13	3.86E-13	3.09E-12
5.60E-18	3.60E-18	1.44E-17	2.00E-17	2.01E-17	3.45E-19	2.26E-19	9.04E-19	1.25E-18	5.30E-17
1.11E-19	6.21E-20	2.48E-19	3.59E-19	3.60E-19	9.87E-22	6.22E-22	2.49E-21	3.48E-21	6.81E-19
6.97E-08	4.53E-08	1.81E-07	2.51E-07	2.92E-07	1.11E-07	7.28E-08	2.91E-07	4.02E-07	6.83E-07
3.09E-15	1.42E-15	5.68E-15	8.77E-15	9.21E-15	2.50E-16	1.32E-16	5.28E-16	7.78E-16	6.06E-15
4.66E-19	2.70E-19	1.08E-18	1.55E-18	1.56E-18	2.06E-20	1.31E-20	5.24E-20	7.30E-20	3.21E-18
4.72E-19	2.59E-19	1.04E-18	1.51E-18	1.51E-18	4.30E-21	2.68E-21	1.07E-20	1.50E-20	2.63E-18
9.04E-07	4.14E-07	1.66E-06	2.56E-06	3.28E-06	4.15E-07	2.19E-07	8.76E-07	1.29E-06	1.78E-06
2.44E-10	1.41E-10	5.64E-10	8.08E-10	8.37E-10	5.11E-11	3.25E-11	1.30E-10	1.81E-10	1.69E-09
3.29E-10	1.81E-10	7.24E-10	1.05E-09	1.06E-09	1.41E-11	8.80E-12	3.52E-11	4.93E-11	1.84E-09
3.26E-08	2.12E-08	8.48E-08	1.17E-07	1.36E-07	5.13E-08	3.36E-08	1.34E-07	1.86E-07	3.21E-07
2.23E-06	1.38E-06	5.52E-06	7.75E-06	7.99E-06	8.27E-08	4.97E-08	1.99E-07	2.82E-07	2.54E-06
2.87E-07	1.25E-07	5.00E-07	7.87E-07	8.69E-07	3.61E-08	1.73E-08	6.92E-08	1.05E-07	3.18E-07
2.74E-06	1.44E-06	5.76E-06	8.50E-06	1.05E-05	7.08E-07	3.57E-07	1.43E-06	2.14E-06	2.82E-06
8.16E-09	4.77E-09	1.91E-08	2.72E-08	2.96E-08	5.53E-09	3.59E-09	1.44E-08	1.99E-08	5.93E-08
1.71E-05	7.43E-06	2.97E-05	4.68E-05	8.56E-05	1.41E-05	6.13E-06	2.45E-05	3.86E-05	1.63E-05
6.46E-20	4.24E-20	1.70E-19	2.34E-19	2.44E-19	2.60E-20	1.70E-20	6.80E-20	9.40E-20	6.47E-19
2.36E-05	1.03E-05	4.12E-05	6.48E-05	1.04E-04	1.41E-05	6.12E-06	2.45E-05	3.86E-05	2.25E-05
1.83E-05	7.93E-06	3.17E-05	5.00E-05	7.07E-05	7.55E-06	3.29E-06	1.32E-05	2.07E-05	1.73E-05
4.52E-08	2.09E-08	8.36E-08	1.29E-07	1.88E-07	5.75E-08	3.41E-08	1.36E-07	1.94E-07	9.70E-08
1.63E-05	7.06E-06	2.82E-05	4.45E-05	1.11E-04	2.40E-05	1.04E-05	4.16E-05	6.56E-05	1.56E-05
3.11E-11	2.04E-11	8.16E-11	1.13E-10	2.17E-10	2.87E-10	1.88E-10	7.52E-10	1.04E-09	3.12E-10
			2.27E-04	**3.94E-04**				**1.68E-04**	

n-bolded isotopes represent decay chain nuclides with no established RGs.

er all exposure pathways (ingestion, inhalation, external, submersion, deposition, and radon).

Fraction = 10%								Removable Fraction =	
Resident Adult Risk[b]			Total Residential Risk	Resident Child Risk[b]				Resident A	
Risk - 1 Wall	Risk - 4 Walls	Total Adult Risk		Risk - Floor	Risk - 1 Wall	Risk - 4 Walls	Total Child Risk	Risk - Floor	Risk - 1 Wall
3.80E-07	1.52E-06	2.11E-06	2.47E-06	1.94E-07	1.25E-07	5.00E-07	6.94E-07	1.15E-06	7.45E-07
1.77E-12	7.08E-12	1.02E-11	1.06E-11	1.79E-13	1.03E-13	4.12E-13	5.91E-13	4.95E-12	3.01E-12
3.47E-17	1.39E-16	1.92E-16	1.93E-16	6.86E-19	4.50E-19	1.80E-18	2.49E-18	1.06E-16	6.92E-17
4.37E-19	1.75E-18	2.43E-18	2.43E-18	1.86E-21	1.19E-21	4.76E-21	6.62E-21	1.31E-18	8.53E-19
4.48E-07	1.79E-06	2.48E-06	2.88E-06	2.22E-07	1.45E-07	5.80E-07	8.02E-07	1.37E-06	8.95E-07
3.40E-15	1.36E-14	1.97E-14	2.04E-14	3.52E-16	2.00E-16	8.00E-16	1.15E-15	9.29E-15	5.57E-15
2.07E-18	8.28E-18	1.15E-17	1.16E-17	3.92E-20	2.54E-20	1.02E-19	1.41E-19	6.21E-18	4.04E-18
1.68E-18	6.72E-18	9.35E-18	9.37E-18	7.95E-21	5.08E-21	2.03E-20	2.83E-20	5.01E-18	3.24E-18
1.00E-06	4.00E-06	5.78E-06	7.07E-06	5.88E-07	3.33E-07	1.33E-06	1.92E-06	2.76E-06	1.65E-06
1.09E-09	4.36E-09	6.05E-09	6.23E-09	9.79E-11	6.32E-11	2.53E-10	3.51E-10	3.30E-09	2.15E-09
1.18E-09	4.72E-09	6.56E-09	6.61E-09	2.61E-11	1.67E-11	6.68E-11	9.29E-11	3.53E-09	2.28E-09
2.11E-07	8.44E-07	1.17E-06	1.35E-06	1.02E-07	6.72E-08	2.69E-07	3.71E-07	6.42E-07	4.21E-07
1.59E-06	6.36E-06	8.90E-06	9.18E-06	9.57E-08	5.85E-08	2.34E-07	3.30E-07	2.89E-06	1.82E-06
1.50E-07	6.00E-07	9.18E-07	1.02E-06	4.29E-08	2.19E-08	8.76E-08	1.31E-07	3.53E-07	1.77E-07
1.51E-06	6.04E-06	8.86E-06	1.10E-05	7.57E-07	3.90E-07	1.56E-06	2.32E-06	2.91E-06	1.59E-06
3.84E-08	1.54E-07	2.13E-07	2.33E-07	1.09E-08	7.11E-09	2.84E-08	3.93E-08	1.16E-07	7.57E-08
7.10E-06	2.84E-05	4.47E-05	8.33E-05	1.40E-05	6.10E-06	2.44E-05	3.84E-05	1.54E-05	6.72E-06
4.24E-19	1.70E-18	2.34E-18	2.44E-18	5.19E-20	3.41E-20	1.36E-19	1.88E-19	1.29E-18	8.48E-19
9.76E-06	3.90E-05	6.15E-05	1.00E-04	1.40E-05	6.08E-06	2.43E-05	3.83E-05	2.11E-05	9.20E-06
7.54E-06	3.02E-05	4.75E-05	6.82E-05	7.52E-06	3.29E-06	1.32E-05	2.07E-05	1.63E-05	7.10E-06
5.54E-08	2.22E-07	3.19E-07	5.13E-07	9.85E-08	6.11E-08	2.44E-07	3.43E-07	1.55E-07	9.37E-08
6.76E-06	2.70E-05	4.26E-05	1.08E-04	2.38E-05	1.03E-05	4.12E-05	6.50E-05	1.48E-05	6.42E-06
2.04E-10	8.16E-10	1.13E-09	2.17E-09	5.74E-10	3.77E-10	1.51E-09	2.08E-09	6.23E-10	4.09E-10
		2.27E-04	**3.96E-04**				**1.69E-04**		

= 20%		
dult Risk[b]		Total Residential Risk
Risk - 4 Walls	Total Adult Risk	
2.98E-06	4.13E-06	4.82E-06
1.20E-11	1.70E-11	1.76E-11
2.77E-16	3.83E-16	3.85E-16
3.41E-18	4.72E-18	4.73E-18
3.58E-06	4.95E-06	5.75E-06
2.23E-14	3.16E-14	3.27E-14
1.62E-17	2.24E-17	2.25E-17
1.30E-17	1.80E-17	1.80E-17
6.60E-06	9.36E-06	1.13E-05
8.60E-09	1.19E-08	1.23E-08
9.12E-09	1.27E-08	1.27E-08
1.68E-06	2.33E-06	2.70E-06
7.28E-06	1.02E-05	1.05E-05
7.08E-07	1.06E-06	1.19E-06
6.36E-06	9.27E-06	1.16E-05
3.03E-07	4.19E-07	4.58E-07
2.69E-05	4.23E-05	8.07E-05
3.39E-18	4.68E-18	4.87E-18
3.68E-05	5.79E-05	9.62E-05
2.84E-05	4.47E-05	6.54E-05
3.75E-07	5.30E-07	8.73E-07
2.57E-05	4.05E-05	1.05E-04
1.64E-09	2.26E-09	4.34E-09
	2.28E-04	**3.97E-04**