OFFSITE DOSE DUE TO GASEOUS RELEASES

Critical Receptor dose results below were calculated using the 2023 effluent source term from Table 11 and Table 12. The Critical Receptor doses include dose from C-14 released between May 1 and September 30, in accordance with the methodology in the MNGP ODCM; this is because only C-14 released during the growing season will be incorporated into food products that contribute to the calculated dose for the Ingestion pathways. Dose due to noble gases released from the Plant Stack and Reactor Building Vent (RBV) release points have been determined for the SSE site boundary location.

The calculated quarterly and annual doses remain a small percentage of the Guidelines provided in Appendix I to 10 CFR 50.

TABLE 2: CRITICAL RECEPTOR ORGAN DOSE

Max Organ	Period	Dose*	10 CFR 50, Appendix I Design Objective	% of Guideline
Thyroid	Q1	0.0137 mrem	7.5 mrem/quarter	0.18%
Thyroid	Q2	0.00967 mrem		0.13%
Bone	Q3	0.0173 mrem		0.23%
Thyroid	Q4	0.00450 mrem		0.06%
Thyroid	**Annual**	**0.0328 mrem**	**15 mrem/year**	**0.22%**

**Includes dose from Iodines, Particulates, Tritium, and Carbon-14.*

TABLE 3: AIR DOSE DUE TO NOBLE GASES AT THE MAXIMUM SITE BOUNDARY LOCATION

Exposure Type	Period	Exposure*	10 CFR 50, Appendix I Design Objective	% of Guideline
Gamma Air Dose	Q1	0.000612 mrad	5 mrad/quarter	0.01%
	Q2	0.000260 mrad		0.01%
	Q3	0.000585 mrad		0.01%
	Q4	0.000403 mrad		0.01%
	Annual	**0.00186 mrad**	**10 mrad/year**	**0.02%**
Beta Air Dose	Q1	0.000154 mrad	10 mrad/quarter	0.0015%
	Q2	0.0000624 mrad		0.0006%
	Q3	0.000215 mrad		0.002%
	Q4	0.000215 mrad		0.002%
	Annual	**0.000646 mrad**	**20 mrad/year**	**0.006%**

**Includes dose due to Noble Gases only.*

Table 11: Gaseous Effluents – Summation of All Releases (RG-1.21 Table 1A)

Type of Effluent	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Est. Total Error, %
A. Fission & Activation Gases						
1. Total Release	Curies	2.65E+01	1.29E+01	1.67E+01	1.57E+01	5.00E+01
2. Average Release Rate for Period	µCi/sec	3.40E+00	1.64E+00	2.10E+00	1.97E+00	
3. Percent of Applicable Limit	%	1.19E-02	5.15E-03	1.12E-02	7.84E-03	
B. Iodines						
1. Total Iodine-131	Curies	1.10E-03	3.98E-04	5.50E-04	4.04E-04	3.20E+01
2. Average Release Rate for Period	µCi/sec	1.41E-04	5.06E-05	6.92E-05	5.08E-05	
3. Percent of Applicable Limit	%	1.10E-01	3.98E-02	5.50E-02	4.04E-02	
C. Particulates						
1. Total Particulates (Half-lives > 8 days)	Curies	1.45E-04	2.93E-04	2.07E-04	2.22E-04	4.00E+01
2. Average Release Rate for Period	µCi/sec	1.87E-05	3.72E-05	2.60E-05	2.79E-05	
3. Percent of Applicable Limit	%	4.95E-03	1.06E-02	5.89E-03	8.34E-03	
4. Gross Alpha Activity	Curies	3.64E-07	5.53E-07	6.23E-07	3.83E-07	5.00E+01
D. Tritium						
1. Total Release	Curies	4.91E+00	3.78E+00	4.20E+00	4.36E+00	3.30E+01
2. Average Release Rate for Period	µCi/sec	6.31E-01	4.80E-01	5.28E-01	5.50E-01	
3. Percent of Applicable Limit	%	9.72E-03	7.32E-03	1.15E-02	1.65E-02	
E. Carbon-14						
1. Total Release	Curies	2.01E+00	1.21E+00	1.81E+00	1.73E+00	N/A

Table 13: Gaseous Effluents – Reactor Building Vent & Water Storage Pond Releases (RG-1.21 Table 1C)

		Continuous Mode				Batch Mode			
Nuclides Released	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4
1. Fission and Activation Gases									
Xe-133	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.31E-04
Xe-135	Curies	3.18E-01	1.83E-01	6.69E-01	8.73E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-135m	Curies	5.73E-01	0.00E+00	6.98E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total for Period	Curies	8.91E-01	1.83E-01	1.37E+00	8.73E-01	0.00E+00	0.00E+00	0.00E+00	2.31E-04
2. Iodines									
I-131	Curies	7.16E-04	1.39E-04	9.56E-05	6.80E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-133	Curies	6.36E-03	5.65E-04	7.94E-04	4.93E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-135	Curies	1.66E-02	0.00E+00	0.00E+00	5.04E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total for Period	Curies	2.36E-02	7.04E-04	8.90E-04	1.07E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3. Particulates									
Ag-110m	Curies	0.00E+00	0.00E+00	9.42E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ba-140	Curies	5.36E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-58	Curies	1.43E-06	2.34E-05	2.10E-05	3.97E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-60	Curies	1.63E-05	1.21E-04	4.42E-05	6.89E-05	0.00E+00	0.00E+00	0.00E+00	2.68E-07
Cr-51	Curies	0.00E+00	2.61E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-137	Curies	3.15E-05	4.80E-06	3.89E-06	2.85E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mn-54	Curies	2.83E-06	1.75E-05	1.86E-06	2.09E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Os-191	Curies	0.00E+00	3.02E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb-124	Curies	0.00E+00	1.09E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr-89	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr-90	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zn-65	Curies	3.35E-06	1.92E-05	3.95E-06	3.22E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total for Period	Curies	1.09E-04	2.26E-04	1.69E-04	1.90E-04	0.00E+00	0.00E+00	0.00E+00	2.68E-07
4. Tritium									
H-3	Curies	4.43E+00	3.07E+00	3.25E+00	3.26E+00	0.00E+00	0.00E+00	0.00E+00	1.99E-04
5. Carbon-14									
C-14	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00