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SECTION 2.0 LIST OF TABLES

This Subsection contains information withheld under 10 CFR 2.390

CHAPTER 2 SITE CHARACTERISTICS

Chapter 2 describes the characteristics of the Clinch River Nuclear (CRN) Site, including the Plant Parameter Envelope (PPE) and the geological, seismological, hydrological, and meteorological characteristics of the site and vicinity. The CRN Site location, characteristics, and site-related design parameters, as described in the following sections, are provided in sufficient detail to support a safety assessment:

Section 2.0: *Plant Parameter Envelope*

Section 2.1: *Geography and Demography*

Section 2.2: *Nearby Industrial, Transportation, and Military Facilities*

Section 2.3: *Meteorology*

Section 2.4: *Hydrologic Engineering*

Section 2.5: *Geology, Seismology, and Geotechnical Engineering*

2.0 PLANT PARAMETER ENVELOPE

Tennessee Valley Authority (TVA) is currently evaluating four light-water-cooled small modular reactor (SMR) technologies for deployment at the CRN Site. Because a technology has not yet been selected, for the Early Site Permit Application (ESPA) the plant-site interface is defined through a collection of site-related design parameters known as the PPE. The PPE approach provides sufficient design detail to support NRC review of the ESPA, while allowing sufficient flexibility for technical developments in new reactor technologies. The actual design selected for the CRN Site would be reviewed within a combined license application (COLA) to demonstrate that the design is bounded by the PPE, and differences would be reviewed for acceptability in the COLA. The PPE developed in support of the CRN Site ESPA is based on data from the four SMR designs under evaluation by TVA. Brief descriptions of these designs are provided in Section 1.11, *Overview of Reactor Types*.

Table 2.0-1 provides a summary listing of the site characteristics of the CRN Site, and Table 2.0-2 provides site-related design parameters from the PPE. The site characteristics, which have been determined in the analyses presented throughout the SSAR, are those necessary to establish the findings required by 10 CFR 52 and 10 CFR 100, regarding suitability of the proposed CRN Site. The site-related design parameters are those that are related to the design of an SMR that might be constructed on the CRN Site in the future. In some cases, it is necessary to assume values for certain site-related design parameters in order to analyze the associated site characteristics. The values selected for the different site-related design parameters represent the bounding values and include engineering, safety, and environmental conservatism as appropriate. Definitions for each of the site characteristics and site-related design parameters are provided, as are references to the location in the SSAR where additional information may be found.

Table 2.0-1 (Sheet 1 of 5)
Site Characteristics

Characteristic/Parameter	Site-Specific Value[(a)]	Description	SSAR Section
Geography and Demography			
Exclusion Area Boundary (EAB)	Clinch River Property Boundary	The area surrounding the reactors, in which the reactor licensee has the authority to determine all activities, including exclusion or removal of personnel and property from the area.	2.1.1
Low Population Zone	1 mi from CRN Site center point	The area immediately surrounding the exclusion area which contains residents, the total number and density of which are such that there is a reasonable probability that appropriate protective measures could be taken in their behalf in the event of a serious accident.	2.1.3.4
Population Center Distance	4.8 mi (southeast)	The distance from the site center point to the nearest boundary of a densely populated center containing more than about 25,000 residents.	2.1.3.5
Meteorology and Hydrology			
Winter Precipitation			
Normal Winter Precipitation Event	21.9 psf	The maximum ground-level weight (lb/ft^2) of the 1) 100-year return snowpack (snow cover), 2) historical snowpack (snow cover), 3) 100-year return 2-day snowfall event, or 4) historical maximum 2-day snowfall event.	2.3.1.3.6.2
Extreme Frozen Winter Precipitation Event	21.9 psf	The maximum ground-level weight (lb/ft^2) of the 1) 100-year return 2-day snowfall event or 2) historical maximum 2-day snowfall event.	2.3.1.3.6.2
Extreme Liquid Winter Precipitation Event (48-hour Probable Maximum Winter Precipitation (PMWP))	23.5 in	The extreme liquid winter precipitation event is defined as the theoretically greatest ground-level depth of precipitation (in inches of water) for a 48-hour period that is physically possible over a 25.9 square kilometer (10 square mile) area at a particular geographical location during those months with the historically highest snowpacks.	2.3.1.3.6.2
Potential for Frazil Ice in Ultimate Heat Sink (UHS) Water Storage Facility	N/A	Potential for accumulated ice formation in the UHS Water Storage Facility in a turbulent flow condition.	2.4.7
Maximum Rainfall Rate	18.8 in/hr 6 in/5-minutes	PMP for 1-hour and for 5-minute durations at the site estimated from Hydro-Meteorological Report HMR-52.	2.3.1.3.3

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Table 2.0-1 (Sheet 2 of 5)
Site Characteristics

Characteristic/Parameter	Site-Specific Value[(a)]	Description	SSAR Section
Maximum Flood (or Tsunami)	[ ]Exempted from Disclosure by Statute	Predicted maximum flood level (including wave run-up) from external events, not including local PMP.	2.4.2, 2.4.3, and 2.4.10
Maximum Ground Water	816.1 ft NAVD88	Maximum groundwater level under deep foundation structures in power block area.	2.4.12
Basic Wind Speed	96.3 mph for a 3-second gust	Wind velocity at 33 ft above ground for Exposure Category C associated with a 100-year return period in the site area.	2.3.1.3.2
Historical Maximum Wind Speed	87 mph for a 3-second gust 73 mph fastest mile	Wind velocity at 33 ft above ground associated with the most severe hurricane wind that has been historically observed in the site region.	2.3.1.3.2
Design-Basis Hurricane Windspeed	130 mph for a 3-second gust	The resulting windspeed for nominal 3-second peak-gust values at a height of 33 ft in flat open terrain.	2.3.1.3.5
Tornado			
Maximum Pressure Drop	1.2 psi	Decrease in ambient pressure from normal atmospheric pressure at the site due to passage of a tornado having a probability of occurrence of 10^{-7} per year.	2.3.1.3.4
Maximum Rotational Speed	184 mph	Rotation component of maximum wind speed at the site due to passage of a tornado having a probability of occurrence of 10^{-7} per year.	2.3.1.3.4
Maximum Translational Speed	46 mph	Translation component of maximum wind speed at the site due to the movement across the ground of a tornado having a probability of occurrence of 10^{-7} per year.	2.3.1.3.4
Maximum Wind Speed	230 mph	Sum of the maximum rotational and translational wind speed components at the site due to passage of a tornado having a probability of occurrence of 10^{-7} per year.	2.3.1.3.4
Radius of Maximum Rotational Speed	150 ft	Distance from the center of the tornado at which the maximum rotational wind speed occurs at site due to passage of a tornado having a probability of occurrence of 10^{-7} per year.	2.3.1.3.4

Table 2.0-1 (Sheet 3 of 5)
Site Characteristics

Characteristic/Parameter	Site-Specific Value[(a)]	Description	SSAR Section
Rate of Pressure Drop	0.5 psi/s	Maximum rate of pressure drop at site due to passage of a tornado having a probability of occurrence of 10^{-7} per year.	2.3.1.3.4
Site Characteristic Ambient Air Temperatures		Site characteristic wet bulb and dry bulb temperatures associated with the listed exceedance values and the 100-year return period.	2.3.1.4
Maximum Dry Bulb Temperature with Maximum Wet Bulb Temperature		The maximum dry-bulb temperature that has existed at the site for 2 hours or more combined with the maximum wet-bulb temperature that exists in that population of dry-bulb temperatures.	
95% Annual Exceedance	30°F Dry Bulb		
5% Annual Exceedance	85°F Dry Bulb 71.8°F Coincident Wet Bulb		
2% Annual Exceedance	90°F Dry Bulb 73.7°F Coincident Wet Bulb		
1% Annual Exceedance	92°F Dry Bulb 74.2°F Coincident Wet Bulb		
0.4% Annual Exceedance	95°F Dry Bulb 74.9°F Coincident Wet Bulb		
0% Annual Exceedance	105°F Dry Bulb 74.6°F Coincident Wet Bulb		
100-Year Return Period	107°F Dry Bulb 73.1°F Coincident Wet Bulb		
Maximum Non-Coincident Wet Bulb Temperature		The maximum historic wet-bulb temperature recorded for 2 or more hours.	
2% Annual Exceedance	75.7°F		
1% Annual Exceedance	76.7°F		
0.4% Annual Exceedance	77.6°F		
0% Annual Exceedance	81.7°F		
100-Year Return Period	83.6°F		
Minimum Dry Bulb Temperature			
2% Annual Exceedance	25°F		
1% Annual Exceedance	21°F		
0.4% Annual Exceedance	16°F		
0% Annual Exceedance	-9°F		
100-Year Return Period	-9.9°F		

Table 2.0-1 (Sheet 4 of 5)
Site Characteristics

Characteristic/Parameter	Site-Specific Value[(a)]	Description	SSAR Section
Atmospheric Dispersion (X/Q) (Accident)		Atmospheric dispersion coefficients used in the design safety analyses to estimate dose consequences of accident airborne releases.	2.3.4
0-2 hr @ EAB	4.96×10^{-3} s/m^3		
0-8 hr @ LPZ	3.10×10^{-4} s/m^3		
8-24 hr @ LPZ	2.26×10^{-4} s/m^3		
1-4 day @ LPZ	1.14×10^{-4} s/m^3		
4-30 day @ LPZ	4.30×10^{-5} s/m^3		
Atmospheric Dispersion (X/Q) (Annual Average)	Refer to Table 2.3.5-10	Atmospheric dispersion coefficient used in the safety analysis for the dose consequences of normal airborne releases.	2.3.5
Gaseous Releases			
Dose Consequences			
Normal	10 CFR 20, App. B 10 CFR 50, App. I	Estimated design radiological dose consequences due to gaseous releases from normal operation of the plant.	11.3.3
Post-Accident	10 CFR 52.17(a)(1)(ix)	Estimated design radiological dose consequences due to gaseous releases from postulated accidents.	15
Minimum Distance from Release Point to EAB	1100 ft	Minimum lateral distance from the effluent release boundary to the EAB.	2.1.1.2 and 2.3.4
Liquid Releases			
Dose Consequences			
Normal	10 CFR 20, App. B 10 CFR 50, App. I	Estimated design radiological dose consequences due to liquid effluent releases from normal operation of the plant.	11.2.3
Post-Accident	10 CFR 20, App. B DC/COL-ISG-013	Estimated design radiological dose consequences due to liquid effluent releases from postulated accidents.	2.4.13
Geology, Seismology, and Geotechnical Engineering			
Ground Motion Response Spectra	Figure 2.5.2-78	The design response spectra used to establish a plant's seismic design.	2.5.2
Capable Tectonic Structures or Sources	None	The assumption made in a plant design about the presence of capable faults or earthquake sources in the vicinity of the plant site (e.g., no fault displacement potential within the investigative area).	2.5.3
Soil Properties			
Liquefaction	None	Liquefaction potential at the site.	2.5.4

Table 2.0-1 (Sheet 5 of 5)
Site Characteristics

Characteristic/Parameter	Site-Specific Value[(a)]	Description	SSAR Section
Minimum Bearing Capacity (Static)	110 ksf	Allowable load-bearing capacity of layer supporting plant structures.	2.5.4
Minimum Shear Wave Velocity	4650 fps	Propagation velocity of shear waves through foundation materials.	2.5.4
Dynamic Bearing Capacity	110 ksf	Capacity of the foundation soil/rock to resist loads imposed by the structures in the event of an earthquake.	2.5.4
Minimum Soil Angle of Internal Friction	36°	Minimum value of the internal friction angle of foundation soils, fill soils, or excavation slopes that would provide a safe design of the plant through soil structure interaction analyses including sliding along the base.	2.5.4

(a) Values shown are for a single unit, but would be the same value for each additional unit.

Table 2.0-2
Site-Related Design Parameters

Characteristic/Parameter	Bounding Value[(a)]	Description	SSAR Section
Structure Height	160 ft	The height from finished grade to the top of the tallest power block structure, excluding stacks and cooling towers.	3.5.1.6
Structure Foundation Embedment	138 ft	The depth from finished grade to the bottom of the basemat for the most deeply embedded power block structure.	2.4.12
Plant Megawatts Thermal	800 MWt (805 MWt including reactor coolant pump) [2420 MWt]	The maximum thermal power generated by one unit and the maximum thermal power for the site.	1.2.2
Minimum Site Grade	821 ft NAVD88	Minimum finished ground elevation in the power block area.	2.4.1
Condenser/Heat Exchanger Design Duty	[5593 MBTU/hr]	Design value for the waste heat rejected to the circulating water system across the condensers.	-
Gaseous Releases			
Source Term (Accident)	Refer to Table 2.0-3	Bounding design basis accident atmospheric release by post-accident interval.	15.2
Source Term (Normal)	Refer to Table 2.0-4	Annual activity, by radionuclide, contained in routine plant airborne effluent streams.	11.3.3
Release Point Elevation			
Accident	Ground level	The elevation above finished grade of the release point for releases due to an accident.	2.3.4
Normal	Ground level	The elevation above finished grade of the release point for normal effluent releases.	2.3.5
Liquid Releases			
Accidental Release	Refer to Table 2.0-5	The assumed activity, by radionuclide, contained in accidental liquid radwaste release.	2.4.13
Source Term (Normal)	Refer to Table 2.0-6	Annual activity, by isotope, contained in routine plant liquid effluent streams.	11.2.3

(a) Values shown are for a single unit, but would be the same value for each additional unit. Bracketed numbers represent the value for multiple units at the site.

Notes:
Immediately prior to the submittal of this application, BWXT announced a series of changes to the mPower reactor design, including an increase in rated electric power to 195 MWe (per unit). Evaluations indicate no impact to the bounding values in the plant parameter envelope (PPE).

Table 2.0-3 (Sheet 1 of 2)
LOCA Bounding Design Basis Accident Atmospheric Radioactive Release (Ci)

Nuclide	Worst 2 hour	0-8 hour	8-24 hour	1-4 days	4-30 days
Kr-85m	3.51×10^{2}	9.28×10^{2}	4.60×10^{2}	2.10×10^{1}	0.00×10^{0}
Kr-85	3.01×10^{1}	1.05×10^{2}	2.50×10^{2}	5.64×10^{2}	4.84×10^{3}
Kr-87	2.66×10^{2}	4.84×10^{2}	1.22×10^{1}	1.00×10^{-2}	0.00×10^{0}
Kr-88	7.48×10^{2}	1.74×10^{3}	4.05×10^{2}	4.20×10^{0}	0.00×10^{0}
Xe-131m	1.92×10^{1}	6.69×10^{1}	1.55×10^{2}	3.13×10^{2}	1.27×10^{3}
Xe-133m	1.17×10^{0}	3.98×10^{0}	8.14×10^{0}	1.07×10^{1}	6.72×10^{0}
Xe-133	3.82×10^{3}	1.32×10^{4}	2.95×10^{4}	5.25×10^{4}	1.04×10^{5}
Xe-135m	2.08×10^{0}	8.91×10^{0}	0.00×10^{0}	0.00×10^{0}	0.00×10^{0}
Xe-135	8.53×10^{2}	2.57×10^{3}	2.70×10^{3}	5.62×10^{2}	2.30×10^{0}
Xe-138	5.81×10^{0}	2.92×10^{1}	0.00×10^{0}	0.00×10^{0}	0.00×10^{0}
I-130	2.12×10^{0}	4.19×10^{0}	1.55×10^{-1}	8.10×10^{-3}	2.00×10^{-4}
I-131	1.34×10^{2}	2.76×10^{2}	1.52×10^{1}	5.80×10^{0}	1.75×10^{1}
I-132	9.61×10^{1}	1.69×10^{2}	1.11×10^{0}	1.00×10^{-7}	0.00×10^{0}
I-133	2.59×10^{2}	5.20×10^{2}	2.28×10^{1}	2.54×10^{0}	2.50×10^{-1}
I-134	4.98×10^{1}	9.21×10^{1}	2.10×10^{-2}	0.00×10^{0}	0.00×10^{0}
I-135	2.06×10^{2}	3.94×10^{2}	1.02×10^{1}	1.50×10^{-1}	0.00×10^{0}
Cs-134	2.35×10^{1}	4.71×10^{1}	2.06×10^{0}	1.11×10^{-2}	9.60×10^{-2}
Cs-136	6.70×10^{0}	1.20×10^{1}	4.60×10^{-1}	3.09×10^{-3}	9.00×10^{-3}
Cs-137	1.80×10^{1}	3.63×10^{1}	1.59×10^{0}	9.07×10^{-3}	7.50×10^{-2}
Cs-138	1.14×10^{1}	2.75×10^{1}	1.00×10^{-8}	0.00×10^{0}	0.00×10^{0}
Rb-86	2.06×10^{-1}	4.15×10^{-1}	1.81×10^{-2}	9.07×10^{-5}	4.80×10^{-4}
Te-127m	2.74×10^{-1}	5.48×10^{-1}	2.62×10^{-2}	1.40×10^{-4}	1.11×10^{-3}
Te-127	1.34×10^{0}	2.52×10^{0}	7.40×10^{-2}	0.00×10^{0}	0.00×10^{0}
Te-129m	9.09×10^{-1}	1.82×10^{0}	8.65×10^{-2}	4.00×10^{-4}	3.00×10^{-3}
Te-129	1.14×10^{0}	1.80×10^{0}	1.70×10^{-3}	0.00×10^{0}	0.00×10^{0}
Te-131m	3.32×10^{0}	6.51×10^{0}	2.67×10^{-1}	5.00×10^{-4}	2.00×10^{-4}
Te-132	2.59×10^{1}	5.14×10^{1}	2.32×10^{0}	8.00×10^{-3}	9.00×10^{-3}
Sb-127	1.59×10^{0}	3.17×10^{0}	1.44×10^{-1}	6.00×10^{-4}	7.00×10^{-4}
Sb-129	3.38×10^{0}	5.99×10^{0}	9.99×10^{-2}	0.00×10^{0}	0.00×10^{0}
Sr-89	7.79×10^{0}	1.56×10^{1}	7.42×10^{-1}	4.00×10^{-3}	2.80×10^{-2}
Sr-90	9.52×10^{-1}	1.91×10^{0}	9.12×10^{-2}	5.00×10^{-4}	4.30×10^{-3}
Sr-91	8.01×10^{0}	1.51×10^{1}	4.46×10^{-1}	0.00×10^{0}	0.00×10^{0}
Sr-92	5.48×10^{0}	9.27×10^{0}	8.32×10^{-2}	0.00×10^{0}	0.00×10^{0}
Ba-139	4.14×10^{0}	6.61×10^{0}	1.17×10^{-2}	0.00×10^{0}	0.00×10^{0}
Ba-140	1.33×10^{1}	2.66×10^{1}	1.25×10^{0}	6.00×10^{-3}	2.60×10^{-2}
Ru-103	1.40×10^{0}	2.81×10^{0}	1.34×10^{-1}	7.00×10^{-4}	4.80×10^{-3}
Ru-105	6.27×10^{-1}	1.12×10^{0}	1.93×10^{-2}	0.00×10^{0}	0.00×10^{0}
Ru-106	4.75×10^{-1}	9.52×10^{-1}	4.55×10^{-2}	2.50×10^{-4}	2.08×10^{-3}
Rh-105	8.37×10^{-1}	1.65×10^{0}	6.92×10^{-2}	2.00×10^{-4}	0.00×10^{0}

Table 2.0-3 (Sheet 2 of 2)
LOCA Bounding Design Basis Accident Atmospheric Radioactive Release (Ci)

Nuclide	Worst 2 hour	0-8 hour	8-24 hour	1-4 days	4-30 days
Mo-99	1.71×10^{0}	3.38×10^{0}	1.51×10^{-1}	5.00×10^{-4}	4.00×10^{-4}
Tc-99m	1.16×10^{0}	2.12×10^{0}	4.78×10^{-2}	0.00×10^{0}	0.00×10^{0}
Ce-141	3.19×10^{-1}	6.38×10^{-1}	3.03×10^{-2}	1.60×10^{-4}	1.02×10^{-3}
Ce-143	2.81×10^{-1}	5.53×10^{-1}	2.30×10^{-2}	5.00×10^{-5}	2.00×10^{-5}
Ce-144	2.65×10^{-1}	5.31×10^{-1}	2.54×10^{-2}	1.40×10^{-4}	1.15×10^{-3}
Pu-238	5.94×10^{-4}	1.19×10^{-3}	5.68×10^{-5}	3.00×10^{-7}	2.70×10^{-6}
Pu-239	7.10×10^{-5}	1.42×10^{-4}	6.79×10^{-6}	4.00×10^{-8}	3.20×10^{-7}
Pu-240	1.08×10^{-4}	2.16×10^{-4}	1.03×10^{-5}	6.00×10^{-8}	4.80×10^{-7}
Pu-241	2.64×10^{-4}	5.30×10^{-4}	2.53×10^{-5}	1.40×10^{-7}	1.19×10^{-6}
Np-239	3.16×10^{0}	6.26×10^{0}	2.76×10^{-1}	8.00×10^{-4}	6.00×10^{-4}
Y-90	9.55×10^{-3}	1.89×10^{-2}	8.43×10^{-4}	2.00×10^{-6}	3.00×10^{-6}
Y-91	1.01×10^{-1}	2.02×10^{-1}	9.62×10^{-3}	5.00×10^{-5}	3.80×10^{-4}
Y-92	6.37×10^{-2}	1.11×10^{-1}	1.47×10^{-3}	0.00×10^{0}	0.00×10^{0}
Y-93	9.72×10^{-2}	1.84×10^{-1}	5.60×10^{-3}	0.00×10^{0}	0.00×10^{0}
Nb-95	1.34×10^{-1}	2.69×10^{-1}	1.28×10^{-2}	7.00×10^{-5}	4.40×10^{-4}
Zr-95	1.32×10^{-1}	2.65×10^{-1}	1.26×10^{-2}	7.00×10^{-5}	5.00×10^{-4}
Zr-97	1.17×10^{-1}	2.25×10^{-1}	8.22×10^{-3}	1.00×10^{-5}	0.00×10^{0}
La-140	1.32×10^{-1}	2.61×10^{-1}	1.11×10^{-2}	3.00×10^{-5}	1.00×10^{-5}
La-142	4.13×10^{-2}	6.62×10^{-2}	1.66×10^{-4}	0.00×10^{0}	0.00×10^{0}
Nd-147	4.89×10^{-2}	9.77×10^{-2}	4.60×10^{-3}	2.00×10^{-5}	8.00×10^{-5}
Pr-143	1.17×10^{-1}	2.34×10^{-1}	1.11×10^{-2}	5.00×10^{-5}	2.40×10^{-4}
Am-241	1.56×10^{-5}	3.12×10^{-5}	1.49×10^{-6}	8.00×10^{-9}	7.00×10^{-8}
Cm-242	3.16×10^{-3}	6.33×10^{-3}	3.02×10^{-4}	1.70×10^{-6}	1.32×10^{-5}
Cm-244	1.84×10^{-4}	3.69×10^{-4}	1.76×10^{-5}	1.00×10^{-7}	8.30×10^{-7}
Total	6.64×10^{3}	2.00×10^{4}	3.31×10^{4}	5.39×10^{4}	1.10×10^{5}

Table 2.0-4
Annual Normal Gaseous Radioactive Release (Ci/y)

Radionuclide	Release per Unit	Release for Site	Radionuclide	Release per Unit	Release for Site
Kr-83m	1.07×10^{-3}	1.28×10^{-2}	Rb-89	6.67×10^{-6}	2.67×10^{-5}
Kr-85m	8.47×10^{1}	3.39×10^{2}	Sr-89	3.00×10^{-3}	9.00×10^{-3}
Kr-85	1.21×10^{2}	7.20×10^{2}	Sr-90	1.20×10^{-3}	3.60×10^{-3}
Kr-87	8.18×10^{0}	3.27×10^{1}	Y-90	7.09×10^{-6}	2.84×10^{-5}
Kr-88	3.63×10^{1}	1.45×10^{2}	Sr-91	1.54×10^{-4}	6.18×10^{-4}
Kr-89	1.25×10^{-7}	5.00×10^{-7}	Sr-92	1.21×10^{-4}	4.84×10^{-4}
Xe-131m	2.75×10^{2}	1.67×10^{3}	Y-91	3.72×10^{-5}	1.49×10^{-4}
Xe-133m	2.63×10^{1}	1.05×10^{2}	Y-92	9.60×10^{-5}	3.84×10^{-4}
Xe-133	5.61×10^{2}	2.24×10^{3}	Y-93	1.71×10^{-4}	6.86×10^{-4}
Xe-135m	3.19×10^{0}	1.28×10^{1}	Zr-95	1.00×10^{-3}	3.00×10^{-3}
Xe-135	7.04×10^{1}	2.82×10^{2}	Nb-95	2.50×10^{-3}	7.50×10^{-3}
Xe-137	7.50×10^{-1}	3.00×10^{0}	Mo-99	9.19×10^{-3}	3.68×10^{-2}
Xe-138	2.86×10^{0}	1.14×10^{1}	Tc-99m	4.59×10^{-5}	1.83×10^{-4}
I-129	6.68×10^{-12}	8.02×10^{-11}	Ru-103	5.42×10^{-4}	2.17×10^{-3}
I-131	7.70×10^{-2}	2.31×10^{-1}	Rh-103m	1.23×10^{-9}	1.48×10^{-8}
I-132	3.38×10^{-1}	1.35×10^{0}	Ru-106	7.80×10^{-5}	2.34×10^{-4}
I-133	2.63×10^{-1}	1.05×10^{0}	Rh-106	3.81×10^{-12}	4.57×10^{-11}
I-134	5.84×10^{-1}	2.33×10^{0}	Ag-110m	1.78×10^{-4}	2.14×10^{-3}
I-135	3.72×10^{-1}	1.49×10^{0}	Sb-124	2.79×10^{-5}	1.12×10^{-4}
H-3	3.10×10^{2}	1.01×10^{3}	Te-129m	3.38×10^{-5}	1.35×10^{-4}
C-14	7.30×10^{0}	1.00×10^{1}	Te-131m	1.17×10^{-5}	4.68×10^{-5}
Na-24	6.25×10^{-4}	2.50×10^{-3}	Te-132	5.94×10^{-6}	7.13×10^{-5}
P-32	1.42×10^{-4}	5.68×10^{-4}	Cs-134	2.30×10^{-3}	6.90×10^{-3}
Ar-41	4.00×10^{1}	5.44×10^{2}	Cs-136	9.19×10^{-5}	3.68×10^{-4}
Cr-51	5.42×10^{-3}	2.17×10^{-2}	Cs-137	8.14×10^{-3}	3.26×10^{-2}
Mn-54	8.35×10^{-4}	5.22×10^{-3}	Cs-138	2.63×10^{-5}	1.05×10^{-4}
Mn-56	5.42×10^{-4}	2.17×10^{-3}	Ba-140	4.17×10^{-3}	1.67×10^{-2}
Fe-55	1.00×10^{-3}	4.01×10^{-3}	La-140	2.79×10^{-4}	1.12×10^{-3}
Fe-59	1.25×10^{-4}	9.55×10^{-4}	Ce-141	1.42×10^{-3}	5.68×10^{-3}
Co-58	2.30×10^{-2}	6.90×10^{-2}	Ce-143	9.63×10^{-9}	1.16×10^{-7}
Co-60	8.80×10^{-3}	2.64×10^{-2}	Ce-144	2.92×10^{-6}	1.17×10^{-5}
Ni-63	1.22×10^{-3}	1.46×10^{-2}	Pr-144	2.92×10^{-6}	1.17×10^{-5}
Cu-64	1.54×10^{-3}	6.18×10^{-3}	W-187	2.92×10^{-5}	1.17×10^{-4}
Zn-65	1.71×10^{-3}	6.86×10^{-3}	Np-239	1.84×10^{-3}	7.35×10^{-3}
Br-84	1.07×10^{-6}	1.28×10^{-5}	Sb-125	9.42×10^{-6}	3.77×10^{-5}
Rb-88	8.17×10^{-7}	9.80×10^{-6}	Co-57	2.75×10^{-5}	1.10×10^{-4}
			Total	1.55×10^{3}	7.13×10^{3}

Table 2.0-5
Accidental Liquid Radwaste Release Source Term

Radionuclide	Release Ci	Radionuclide	Release Ci
I-129	5.89×10^{-3}	Sr-92	1.84×10^{5}
I-130	2.42×10^{3}	Y-92	1.86×10^{5}
I-131	1.42×10^{5}	Y-93	2.10×10^{5}
I-132	2.07×10^{5}	Zr-95	5.00×10^{3}
I-133	2.92×10^{5}	Nb-95	5.00×10^{3}
I-134	3.28×10^{5}	Mo-99	2.65×10^{5}
I-135	2.78×10^{5}	Tc-99m	2.35×10^{5}
H-3	1.25×10^{2}	Ru-103	2.24×10^{5}
C-14	1.37×10^{-1}	Rh-103m	2.24×10^{5}
Na-24	7.68×10^{1}	Ru-106	8.63×10^{4}
P-32	1.95×10^{1}	Rh-106	9.16×10^{4}
Cr-51	8.04×10^{3}	Ag-110m	4.31×10^{2}
Mn-54	7.49×10^{2}	Sb-124	1.18×10^{2}
Mn-56	2.26×10^{4}	Te-129m	7.21×10^{3}
Co-58	1.21×10^{3}	Te-131m	2.73×10^{4}
Co-60	2.59×10^{2}	Te-132	2.02×10^{5}
Fe-55	2.99×10^{3}	Cs-134	3.01×10^{4}
Fe-59	1.93×10^{2}	Cs-136	1.00×10^{4}
Ni-63	9.63×10^{1}	Cs-137	2.45×10^{4}
Cu-64	5.25×10^{-1}	Cs-138	2.71×10^{5}
Zn-65	8.50×10^{-5}	Ba-140	2.50×10^{5}
Rb-89	1.30×10^{5}	La-140	2.58×10^{5}
Sr-89	1.34×10^{5}	Ce-141	2.36×10^{5}
Sr-90	1.87×10^{4}	Ce-144	2.02×10^{5}
Y-90	1.94×10^{4}	Pr-143	2.15×10^{5}
Sr-91	1.71×10^{5}	Np-239	2.72×10^{6}
Y-91	1.76×10^{5}		
		Total	8.11E $\times 10^{6}$

Table 2.0-6 (Sheet 1 of 2)
Annual Normal Liquid Radioactive Release (Ci/y)

Radionuclide	Release per Unit	Release for Site	Radionuclide	Release per Unit	Release for Site
I-129	4.20×10^{-10}	5.04×10^{-9}	Ru-105	1.76×10^{-8}	7.04×10^{-8}
I-130	4.62×10^{-6}	1.85×10^{-5}	Rh-103m	3.64×10^{-7}	4.37×10^{-6}
I-131	1.38×10^{-2}	1.66×10^{-1}	Ru-106	9.80×10^{-3}	3.92×10^{-2}
I-132	4.40×10^{-2}	1.32×10^{-1}	Rh-106	9.35×10^{-8}	3.74×10^{-7}
I-133	2.30×10^{-2}	2.76×10^{-1}	Rh-105	1.07×10^{-7}	4.27×10^{-7}
I-134	3.26×10^{-3}	3.91×10^{-2}	Ag-110m	2.22×10^{-3}	2.66×10^{-2}
I-135	1.37×10^{-2}	1.64×10^{-1}	Ag-110	8.69×10^{-9}	3.48×10^{-8}
H-3	2.21×10^{2}	8.85×10^{2}	Sb-124	5.73×10^{-5}	2.29×10^{-4}
C-14	8.19×10^{-4}	9.83×10^{-3}	Sb-125	1.98×10^{-9}	7.92×10^{-9}
Na-24	2.80×10^{-3}	8.40×10^{-3}	Sb-127	1.10×10^{-8}	4.40×10^{-8}
P-32	7.57×10^{-5}	3.03×10^{-4}	Sb-129	4.40×10^{-9}	1.76×10^{-8}
Cr-51	1.07×10^{-2}	1.28×10^{-1}	Te-127m	1.43×10^{-6}	5.72×10^{-6}
Mn-54	5.44×10^{-3}	6.53×10^{-2}	Te-127	3.19×10^{-6}	1.28×10^{-5}
Mn-56	2.72×10^{-4}	1.09×10^{-3}	Te-129m	2.30×10^{-2}	6.90×10^{-2}
Co-58	5.20×10^{-3}	5.51×10^{-2}	Te-129	4.13×10^{-5}	1.65×10^{-4}
Co-60	2.05×10^{-3}	8.21×10^{-3}	Te-131m	6.60×10^{-4}	1.98×10^{-3}
Fe-55	4.06×10^{-3}	4.87×10^{-2}	Te-131	1.01×10^{-5}	4.05×10^{-5}
Fe-59	9.92×10^{-4}	1.19×10^{-2}	Te-132	4.40×10^{-2}	1.32×10^{-1}
Ni-63	1.53×10^{-2}	1.84×10^{-1}	Te-134	2.64×10^{-7}	1.06×10^{-6}
Cu-64	1.68×10^{-3}	6.72×10^{-3}	Cs-134	2.87×10^{-3}	3.44×10^{-2}
Zn-65	1.76×10^{-3}	2.11×10^{-2}	Cs-136	2.93×10^{-3}	1.17×10^{-2}
Br-82	1.87×10^{-6}	7.48×10^{-6}	Cs-137	3.53×10^{-3}	4.24×10^{-2}
Br-83	3.52×10^{-6}	1.41×10^{-5}	Cs-138	1.18×10^{-3}	1.42×10^{-2}
Br-84	8.38×10^{-5}	1.01×10^{-3}	Ba-137m	5.17×10^{-4}	2.07×10^{-3}
Br-85	2.42×10^{-9}	9.68×10^{-9}	Ba-139	1.54×10^{-8}	6.16×10^{-8}
Rb-86	1.87×10^{-5}	7.48×10^{-5}	Ba-140	1.60×10^{-2}	4.80×10^{-2}
Rb-88	3.73×10^{-3}	1.49×10^{-2}	La-140	1.07×10^{-3}	4.27×10^{-3}
Rb-89	5.15×10^{-5}	6.18×10^{-4}	La-141	2.20×10^{-8}	8.80×10^{-8}
Sr-89	4.19×10^{-5}	1.67×10^{-4}	La-142	2.97×10^{-9}	1.19×10^{-8}
Sr-90	3.57×10^{-6}	1.43×10^{-5}	Ce-141	3.96×10^{-5}	1.58×10^{-4}
Sr-91	1.67×10^{-4}	6.67×10^{-4}	Ce-143	8.13×10^{-5}	3.25×10^{-4}
Sr-92	5.91×10^{-5}	2.36×10^{-4}	Ce-144	7.47×10^{-4}	2.99×10^{-3}
Y-90	1.55×10^{-7}	1.86×10^{-6}	Pr-143	1.73×10^{-5}	6.93×10^{-5}
Y-91	3.13×10^{-5}	1.25×10^{-4}	Pr-144	4.21×10^{-4}	1.69×10^{-3}
Y-91m	6.67×10^{-6}	2.67×10^{-5}	Nd-147	2.67×10^{-7}	1.07×10^{-6}
Y-92	2.25×10^{-4}	9.01×10^{-4}	Np-239	2.49×10^{-3}	2.99×10^{-2}
Y-93	1.81×10^{-4}	7.25×10^{-4}	Pu-238	6.60×10^{-10}	2.64×10^{-9}
Zr-95	1.83×10^{-4}	2.20×10^{-3}	Pu-239	8.47×10^{-11}	3.39×10^{-10}

Table 2.0-6 (Sheet 2 of 2)
Annual Normal Liquid Radioactive Release (Ci/y)

Radionuclide	Release per Unit	Release for Site	Radionuclide	Release per Unit	Release for Site
Zr-97	1.10×10^{-7}	4.40×10^{-7}	Pu-240	1.07×10^{-10}	4.27×10^{-10}
Nb-95	2.67×10^{-4}	1.07×10^{-3}	Pu-241	3.19×10^{-8}	1.28×10^{-7}
Mo-99	3.77×10^{-3}	4.52×10^{-2}	Am-241	4.62×10^{-11}	1.85×10^{-1}
Tc-99m	1.89×10^{-3}	2.27×10^{-2}	Cm-242	9.46×10^{-9}	3.78×10^{-8}
Tc-99	4.40×10^{-9}	1.76×10^{-8}	Cm-244	4.40×10^{-10}	1.76×10^{-9}
Ru-103	6.57×10^{-4}	2.63×10^{-3}	W-187	2.10×10^{-4}	6.30×10^{-4}
			Total	2.22×10^{2}	8.87×10^{2}