Cesium-137 and strontium-90 are the most dangerous radioisotopes to the environment in terms of their long-term effects. Their intermediate half-lives of about 30 years suggests that they are not only highly radioactive but that they have a long enough half-life to be around for hundreds of years. Iodine-131 may give a higher initial dose, but its short half-life of 8 days ensures that it will soon be gone. Besides its persistence and high activity, cesium-137 has the further insidious property of being mistaken for potassium by living organisms and taken up as part of the fluid electrolytes. This means that it is passed on up the food chain and re-concentrated from the environment by that process.

Strontium-90 and cesium-137 are the radioisotopes which should be most closely guarded against release into the environment. They both have intermediate half-lives of around 30 years, which is the worst range for half-lives of radioactive contaminants. It ensures that they are not only highly radioactive but also have a long enough half-life to be around for hundreds of years. Strontium-90 mimics the properties of calcium and is taken up by living organisms and made a part of their electrolytes as well as deposited in bones. As a part of the bones, it is not subsequently excreted like cesium-137 would be. It has the potential for causing cancer or damaging the rapidly reproducing bone marrow cells.

Strontium-90 is not quite as likely as cesium-137 to be released as a part of a nuclear reactor accident because it is much less volatile, but is probably the most dangerous components of the radioactive fallout from a nuclear weapon.

Strontium nuclear data

Human Produced Nuclides

Nuclide	Symbol	Half-life	Source
Tritium	^{3}H	12.3 yr	Produced from weapons testing and fission reactors; reprocessing facilities, nuclear weapons manufacturing
Iodine 131	^{131}I	8.04 days	Fission product produced from weapons testing and fission reactors, used in medical treatment of thyroid problems
Iodine 129	^{129}I	1.57 x 10^{7} yr	Fission product produced from weapons testing and fission reactors
Cesium 137	^{137}Cs	30.17 yr	Fission product produced from weapons testing and fission reactors
Strontium 90	^{90}Sr	28.78	Fission product produced from weapons testing and

		yr	fission reactors
Technetium 99	^{99}Tc	2.11 x 10^5 yr	Decay product of ^{99}Mo, used in medical diagnosis
Plutonium 239	^{239}Pu	2.41 x 10^4 yr	Produced by neutron bombardment of ^{238}U (^{238}U + n--> ^{239}U--> ^{239}Np +ß--> ^{239}Pu+ß)