
Appendix E

Radionuclides Detected by Gamma Spectroscopy (Gamma Scan)

One of the several forms of radiation is gamma radiation. Gamma radiation is emitted by many radionuclides. Gamma spectroscopy, sometimes called a gamma scan, is used in the environmental surveillance program to detect the presence of the radionuclides shown in Table E.1. These radionuclides may be natural or result from Hanford Site activities. They include activation

products formed by the absorption of a neutron by a stable element and fission products that occur following fission (splitting) of nuclear fuel radionuclides like plutonium-239 or uranium-235. These radionuclides may not be discussed in the main body of this report if they are below detection levels.

Table E.1. Radionuclides Analyzed by Gamma Spectroscopy

Radionuclide	Symbol	Source
Beryllium-7	${}^7\text{Be}$	Natural
Sodium-22	${}^{22}\text{Na}$	Activation product
Sodium-24	${}^{24}\text{Na}$	Activation product
Potassium-40	${}^{40}\text{K}$	Natural
Manganese-54	${}^{54}\text{Mn}$	Activation product
Cobalt-58	${}^{58}\text{Co}$	Activation product
Cobalt-60	${}^{60}\text{Co}$	Activation product
Iron-59	${}^{59}\text{Fe}$	Activation product
Zinc-65	${}^{65}\text{Zn}$	Activation product
Zirconium/Niobium-95	${}^{95}\text{Zr/Nb}$	Activation product and fission product
Molybdenum-99	${}^{99}\text{Mo}$	Activation product and fission product
Ruthenium-103	${}^{103}\text{Ru}$	Activation product and fission product
Ruthenium-106	${}^{106}\text{Ru}$	Fission product
Antimony-125	${}^{125}\text{Sb}$	Activation product
Iodine-131	${}^{131}\text{I}$	Fission product
Cesium-134	${}^{134}\text{Cs}$	Activation product
Cesium-137	${}^{137}\text{Cs}$	Fission product
Barium/Lanthanum-140	${}^{140}\text{Ba/La}$	Fission product
Cerium-141	${}^{141}\text{Ce}$	Activation product and fission product
Cerium/Praseodymium-144	${}^{144}\text{Ce/Pr}$	Fission product
Europium-152	${}^{152}\text{Eu}$	Activation product
Europium-154	${}^{154}\text{Eu}$	Activation product
Europium-155	${}^{155}\text{Eu}$	Activation product