Editorial
Volume 13:2, 2022

Journal of
Nuclear Medicine & Radiation Therapy

ISSN: 2155-9619

Open Access

An Overview of Environmental Radioactivity

Evancy Paul*

Department of Medicine, The Johns Hopkins University School of Medicine Baltimore, United States

Editorial

Radioactive materials in the human environment cause environmental radioactivity. While some radioisotopes, such as strontium-90 (^{90}Sr) and technetium-99 (^{99}Tc), are only found on Earth as a result of human activity and others, such as potassium-40 (^{40}K), are only found as a result of natural processes, a few isotopes, such as tritium (^{3}H), are produced by both natural and human processes. Human activity can influence the concentration and location of some natural isotopes, particularly uranium-238 (^{238}U). A nuclear weapons test is one of the most dramatic sources of man-made radiation. The radioisotopes generated by neutron activation and nuclear fission are found in the glassy trinitite made by the first atom bomb. There are also some natural radioisotopes present. The quantities of long-lived radioisotopes in trinitite were recently reported in a publication. Trinitite is made up of feldspar and quartz that have been fused together by heat. The first sample (left-hand side bars in the graph) was obtained between 40 and 65 metres from ground zero, while the other sample was taken further away.

The isotopes 152Eu (half-life 13.54 years) and 154Eu (half-life 8.59 years) were generated primarily by neutron activation of europium in the soil, and it is obvious that the level of radioactivity for these isotopes is highest where the neutron dosage to the soil was higher. Some of the 60Co (half-life 5.27 year) is produced by cobalt activation in the soil, but some is also produced by cobalt activation in the steel (100 foot) tower. The 60Co emitted by the tower would have been dispersed over the land, eliminating the disparity in soil levels. The neutron activation of barium and plutonium inside the weapon produces the ^{133}Ba (half-life 10.5 year) and ^{241}Am (half-life 432.6 year) isotopes. The chemical explosives employed contained barium in the form of nitrate, whereas the fissile fuel utilised was plutonium. The level of ^{137}Cs is higher in the sample that was further away from the ground zero point, which is assumed to be due to the volatile nature of the ^{137}Cs precursors (^{137}I and ^{137}Xe) and, to a lesser extent, the caesium itself. In both places, the natural radioisotopes in the glass are roughly the same. The action of neutrons on stable isotopes can result in the formation of radioisotopes; for example, the bombardment (neutron activation) of nitrogen-14 results in the formation of carbon-14. This radioisotope can be released from the nuclear fuel cycle, and it is the radioisotope that is responsible for the majority of the dose received by the general public as a result of nuclear power sector activities.

The specific activity of carbon has increased as a result of nuclear bomb tests, whereas it has reduced as a result of the use of fossil fuels. For further information, see the article on radiocarbon dating. Within the nuclear fuel cycle, nuclear plant discharges release fission products into the environment. Because the nuclear fuel is allowed to cool for several years before being dissolved in nitric acid, the discharges from nuclear reprocessing plants tend to be medium to long-lived radioisotopes. Iodine-131, which can also be generated as an activation product by neutron activation of tellurium, is an example of a short-lived fission product. The short-lived isotopes in both bomb fallout and a release from a power reactor accident cause the dose rate on day one to be significantly higher than it will be at the same spot many days later. This is true even if no decontamination attempts are done [1-5].

References

1. Wang, Shiow-Ing, Chih-Liang Yaung, Long-Teng Lee and Shang-Jyh Chiou. "Cancer incidence in the vicinity of nuclear power plants in Taiwan: A population-based study." *Environ Sci Pollut Res Int* 23(2016):571–580.
2. Kim, Jeong-Min, Myoung-Hee Kim, Young-Su Ju and Seung-sik Hwang, et al. "Reanalysis of epidemiological investigation of cancer risk among people residing near nuclear power plants in South Korea." *Int J Environ Res Public Health* 15 (2018): 481.
3. Dagher, R. L. E. & Thompson, J. B. P. A. "Radiation exposure and cancer incidence (1990 to 2008) around nuclear power plants in Ontario Canada." *J Environ Protect* 04(2013): 888–913.
4. Kim, J., Bang, Y. & Lee, W. J. "Living near nuclear power plants and thyroid cancer risk: A systematic review and meta-analysis." *Environ Int* 87(2016): 42–48.
5. Mossang, D. et al. "Evaluation of the nuclear power plant Kozloduy impact on the population health state in the area." *Romanian Rep Phys* 61(2009): 301–312.

How to cite this article: Evancy, Paul. "An Overview of Environmental Radioactivity" J Nucl Med Radiat Ther 13 (2022): 674.

***Address for Correspondence:** Evancy Paul, Department of Medicine, The Johns Hopkins University School of Medicine Baltimore, United States, E-mail: paul.eve@gmail.com*

Received 08 February, 2022, Manuscript No. jnmrt-22-56014; **Editor Assigned:** 10 February, 2022, PreQC No. P-56014; QC No.Q-55987; **Reviewed:** 13 February, 2022; **Revised:** 18 February, 2022, Manuscript No. R-56014; **Published:** 23 February, 2022, DOI:10.37421/2155-9619.2022.13.674