

Development of scenarios to assess the transfer of radionuclides to groundwater from liquid discharges in NORM industries

***J. Guillén, L. Cabezas-Vinagre, and A. Salas**

LARUEX, Dpt. Applied Physics, Fac. Veterinary Sciences, University of Extremadura, Avda. Universidad, s/n, 10003, Cáceres, Spain

** e-mail: fguillen@gmail.com corresponding/presenting author*

By-products and wastes from NORM (Naturally Occurring Radioactive Material) industries present usually enhanced concentration of naturally occurring radionuclides. Some of them are liquid, such as waters from acid drainage sites, uranium mine tailings, or phosphogypsum ponds. There is a huge variability in the types of locations, size of water bodies, radionuclide concentration, type of water, hydrogeochemical characteristics of the site that can have a significant influence on the transfer of naturally occurring radionuclides to groundwater. Then, their occurrence in groundwater can pose a radiological hazard, since it can be used for irrigation, watering animals or drinking water. In this study, we developed two different scenarios in which most of these parameters are fixed after consulting the corresponding literature. The first scenario is based on a pond with high radionuclide concentration that leaks/percolates into a groundwater aquifer; whereas in the second scenario the source term is a leaking pipe in the ground above the aquifer. The purpose of these scenarios is to fix the variable that can influence the transfer in order to later being able to compare the predictions made by several modelling software (PC-CREAM08, RESRAD offsite, Normalysa, AFRY, etc.)

Acknowledgements

This study is funded by the Consejo de Seguridad Nuclear through the project “Metodología simplificada para la estimación de la contaminación radiactiva de aguas subterráneas por efluentes líquidos”.