

Assessment of Determination of the Place of the Underground Nuclear Tests by Means of Artificial Radionuclides Presence in Groundwater with STS Example

Results of the study of groundwater in areas of underground nuclear explosions (UNE) on Semipalatinsk test site (STS) have shown that the presence of high concentrations of ^{137}Cs and ^{90}Sr (hundreds of Bq/kg), which can be found only near the venue of the UNE. At a distance from the epicenter of the explosion up to 200 m radionuclide concentration is reduced to a fraction of Bq/kg. At the same time, tritium concentration remains sufficiently high, with value, which depends on the characteristics of the geological structure and hydrogeological conditions. Quantitative values of tritium more than 7 Bq/kg is observed at distances up to 20 km from the epicenter of UNE. Tritium is part of tritiated water and is not adsorbed by rocks at migration. So, tritium can significantly move in short period from UNE place with ground waters. At on-site inspection in regions like STS measurement of tritium concentration in ground water allows to do the general conclusion of UNE presence in 20 km radius. The presence of ^{137}Cs and ^{90}Sr in ground water shows more precise place of UNE epicenter.

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