# COMPARATIVE ESTIMATION OF POPULATION BODY BURDEN IN SETTLEMENTS LOCATED IN AFFECTED ZONE OF DIFFERENT TYPE RADIATION-DANGEROUS OBJECTS

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The results of comparative estimation of population body burden in settlements located in affected zone of different type radiation-dangerous objects are represented. This estimation was executed on basis of complex radio-ecological investigations results.

For comparison the settlements located in potential affected zone of peaceful underground nuclear explosions places (Azgir site and LIRA objects), uranium-mining and processing factories in Northern Kazakhstan inspection results were used.

The results of systematic complex investigations allow to soundly assert that the main hostility in Azgir and Balkuduk settlements is drinking water quality and at present time radiation environment is normal and determined by natural radiation factors. Thus negative influence of Azgir testing site on population health is not observed.

Effective radiation doses of settlements adjacent to LIRA object population were calculated.

Total radiation dose is about 2000-6000 μSv/year and the main radiation dose caused by inhalation of radon daughter decay products – 43.6%, artificial radionuclides portion is only 0.1%.

Represented data is in complete agreement with results of settlements complex radio-ecological investigation. Soil contamination levels ..... in monitoring settlements do not exceed background values which are typical for Western Kazakhstan.

The findings are confirmation of radio-ecological situation on investigated area stability and are indirect evidence of artificial isotopes global origin in settlements soils. LIRA objects influence on radiation environment was not detected. In tote situation in all settlements is sufficiently stable and not hazard for population.

Negative influence of Stepnogorsk processing plant tailing dump on adjoin territories environment which expressed in soil, water and vegetation contamination by radionuclides and heavy metals was confirmed. $^{210}$Pb increased values are detected at a 10 km distance what evidently is a result of radon emanation and wind transfer.

It was registered that tailing dump is not the only environment radioactive contamination source. High concentrations of natural radionuclides and heavy metals were detected in soil, water and vegetation samples.

At Aksu and Zavodskoy settlements spacious plots with increased gamma background (up to 100 μR/h) were found, in soil content of $^{226}$Ra, $^{232}$Th and $^{210}$Pb up to 1000 Bq/kg were registered.

In certain living and industrial premises extremely high concentration of radon in air was registered, normative permissible levels are exceeded in 10 and more times. Presence of high average annual equivalent equilibrium volumetric activity of daughter decay products can be the reason of effective dose increasing up to 80 mSv per year when permissible dose for population is 10 mSv.

In living and industrial premises in Saumalkol settlement radon measured concentrations are higher than in Aksu and reached 6000-7000 Bq/m$^3$ what can lead to exceeding many times radiation doses of population in comparison with permissible doses.

On the ground of existing radio-ecological hazard sources comparison taking into account such "nonphysical" parameters as population density in radiation-dangerous object placement, object accessibility, we can draw following main conclusions:

- firstly radio-ecological problems of nuclear explosions carrying out places in certain cases is not so critical and they are attended unreasonably strong;
- secondly the main attention must be reoriented on studying of radio-ecological problems in regions where removal and redistribution of natural radionuclides were carried out as a result of industrial human activity.