



NATURAL RADIOACTIVITY RELEASES FROM LIGNITE POWER PLANTS IN SOUTHWESTERN ANATOLIA

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The Mugla basin is one of the most productive lignite basins in Southwestern Anatolia Turkey. Mining activities started in 1979 and total reserves were estimated during exploration at 767.5 million tonnes. Total mean annual lignite production of the Mugla basin is estimated at about 10 million tonnes per year. Most of the lignite production supplies three thermal power plants (Yatagan 630 MW, Yenikoy 420 MW, Kemerkoç 630 MW) with a total capacity of 1680 MW.

It is well known that lignite contains naturally occurring primordial radionuclides arising from the uranium and thorium series as well as from ⁴⁰K. Lignite burning is therefore one of the sources of technologically enhanced exposure to humans from natural radionuclides. The investigation reported here deals with the determination of the ²²⁶Ra, ²³²Th and ⁴⁰K concentrations in the lignite feeding 3 thermal power plants in the Mugla region and in the product ash.

Samples of lignite feeding the power plants and fly and bottom ashes produced in the same power plants were collected over a period of 1 year and therefore systematic sampling allowed for the determination of mean representative values for the natural radioactivity content of these materials and also estimation of the radioactivity releases to the environment. Furthermore, grid soil sampling within 10-15 km around the power plants allowed for the mapping of the surface soil activity of natural radionuclides. Dosimetric calculations from terrestrial gamma radiation for the population living around the power plants were performed based on the guidance of UNSCEAR 2000 report.

Keywords: Fly ash, natural radioactivity, power plant, lignite burning