

## Radiological Characterization around the Afsin-Elbistan Coal-Fired Power Plant in Turkey

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A radiological characterization of soil samples around the Afsin-Elbistan coal-fired thermal power plant in the Mediterranean region of Turkey was carried out. Moreover, activity concentrations and chemical analyses of coal samples used in this power plant and fly ash and slag samples originating from coal combustion were measured. For this purpose, coal, fly ash, slag, and soil samples were collected from this region. The analysis shows that the samples include relevant natural radionuclides such as  $^{226}\text{Ra}$ ,  $^{232}\text{Th}$  and  $^{40}\text{K}$ . The mean activity concentrations of  $^{226}\text{Ra}$ ,  $^{232}\text{Th}$ , and  $^{40}\text{K}$  were 167, 44, and 404  $\text{Bq}\cdot\text{kg}^{-1}$ , respectively. Obtained values shows that the average radium equivalent activity, air-absorbed dose rate, annual effective dose, and external hazard index for all samples are 258  $\text{Bq}\cdot\text{kg}^{-1}$ , 121  $\text{nGy}\cdot\text{h}^{-1}$ , 148  $\mu\text{Sv}\cdot\text{y}^{-1}$ , and 0.7, respectively. The environmental effect of natural radionuclides caused by coal-fired power plants was considered to be negligible because the  $\text{Ra}_{\text{eq}}$  values of the measured samples are generally lower than the limit value of 370  $\text{Bq}\cdot\text{kg}^{-1}$ , equivalent to a gamma dose of 1.5  $\text{mSv}\cdot\text{y}^{-1}$ . A comparison of the concentrations obtained in this work with other parts of the world indicates that the radioactivity content of the samples is not significantly different.

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