The raw material used in the production of fertilizers is phosphate ore containing various amounts of naturally radioactive elements. During phosphate ore processing, owing to chemical properties of radium, practically all $^{226}\text{Ra}$ gets incorporated into phosphogypsum and becomes the main source of radioactivity. This study was carried out in a fertilizer factory in central Croatia, which may represent a site of significant environmental contamination due to fertilizer production and phosphogypsum deposition in the area. The purpose of this paper was to determine whether ingestion of drinking water in this area poses a health risk for the inhabitants. The results of our study confirmed the occurrence of $^{226}\text{Ra}$ in elevated concentrations in the samples of trickling waters. However, concurrent analyses of drinking water indicated that the risk of adverse health effects for the population living in the vicinity of a phosphate fertilizer plant is negligible.
INTRODUCTION

Phosphate ore is the starting material for all phosphate products and the main source of phosphorus for fertilizer production. It can be of sedimentary, volcanic or biological origin. Phosphate ores of different origin contain various amounts of natural radioactive elements, which originate from the decay of natural uranium and thorium in the ore. The utilization of phosphate rock in fertilizers redistributes these natural radionuclides and may be responsible for some environmental contamination and further exposure of the public. There are a number of studies on the impact of phosphate industry on the environment.

Although the presence of radioactivity in phosphate rock is known since many years, it has become a focus of concern to those engaged in radiation protection only within the last years. The most important aspect of radiation protection is to prevent radium from entering the human body. In human exposure the critical pathway for radium is ingestion through food chains or drinking water. Once deposited in bone tissue, $^{226}$Ra (half-life 1622 y), which is an $\alpha$-emitter and has a high potential for causing biological damage, continually irradiates the human skeleton for many years and potentially induces bone sarcoma.

Phosphogypsum is the by-product resulting from phosphoric acid or phosphate fertilizer production. During processing, the $^{238}$U generally remains in the phosphoric product, while the daughter $^{226}$Ra tends to be concentrated in the phosphogypsum. Since the chemical properties of radium are equivalent to those of calcium, practically all radium gets into the phosphogypsum produced in wet process phosphoric acid plants. Most of the phos-