

# SELECTION OF OPTIMAL CONTROLLED SOLUTION METHOD FOR SALT DEPOSIT TUZLA

*by*

Prof. Dr. Muris Osmanagic  
Dr. Mr. Ibrahim Imamovic  
Muhamed Avdagic, dipl. eng.  
TUZLA MINING INSTITUTE

## Introduction

The Tuzla salt deposit is located in the central part of Yugoslavia, some 100 km to the north of Sarajevo, capital of Bosnia and Hercegovina. Salt solution mining by boreholes from the ground surface in this deposit was performed in ancient Roman times, and then, during the times of Turkish and Austria-Hungarian empires. After World War II, an intensification of salt solution mining resulted in significant land subsidence and damage to the city of Tuzla. During the period of 1914-1956, the maximum land subsidence in the center of the solution area was 3.40 meters, and from 1956 to 1986, it was 4.60 meters, making a total of 8.0 meters.

In addition to salt solution exploitation, reaching a maximum capacity of 2 million cubic meters of brine, annually, in the beginning of 1980's, an underground rock salt mine, Tusanj, was opened in the 1960's, in the middle part of the salt deposit. Hoisting and ventilation shafts were built to a depth of 540 meters. In this mine, 150 to 300 tons of rock salt is being produced annually by the room and pillar method. A two-hundred-meter-wide safety pillar is used to separate the mine from the salt solution area.

In the last few years, to prevent damage and protect the ground surface affected by the borehole salt solution operations, the production of brine was reduced by fifty percent and replaced by a new controlled salt solution method in the Tusanj mine. This method was introduced, with help and cooperation of experts from Poland, on the lowest level of the underground mine (horizon - 250 m). The brine is produced in cavities of designed dimensions, and is transported to the ground surface by pipelines, running through the mine and hoisting shaft. This method has already been modified and improved so much by Yugoslav scientists and mining engineers of the Tusanj salt mine, that it could be called our own new method of controlled salt solution mining with two mobile casings. In the meantime, work is beginning on designing and preparing for salt exploitation of a newly discovered deposit Tetima, located not far from the present deposit Tusanj.

Intending to create a scientific and engineering basis for designing the most suitable salt solution method for the new deposit Tetima, a Yugoslav-American joint project was established in March of 1987. From the Yugoslav side, the responsible institute for the project is The Tuzla Mining Institute, and from the American side, the U.S. Bureau of Mines in Washington, DC.