

3D geological model of the bauxite-bearing district Bnižnica (Posušje, BiH): A powerfull tool from 3D visualization of geological structures to geological prospecting

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12th ESSEWECA conference

8th – 9th December 2022

Bratislava, Slovakia



Environmental, Structural and Stratigraphical Evolution of the Western Carpathians

Abstract book



Faculty of Natural Sciences

doc. Mgr. Natália Hudáčková, PhD.

Mgr. Andrej Ruman, PhD.

doc. RNDr. Michal Šujan, PhD.

Editors

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3D geological model of the bauxite-bearing district Bnižnica (Posušje, BiH): A powerful tool from 3D visualization of geological structures to geological prospecting

IVICA PAVIČIĆ, IVAN DRAGIČEVIĆ, IDA PAVLIN,
FILIP ŠEGOVIĆ and VLADISLAV BRKIĆ

*Faculty of Mining, Geology and Petroleum Engineering, University of Zagreb,
Pierottijeva, 6, 10 000 Zagreb, Croatia; e-mail: ivica.pavicic@rgn.hr*

Bauxite deposits formed during the terrestrial phase between the Upper Cretaceous and Paleogene periods represent the most valuable bauxites economically in the Adriatic Carbonate Platform (AdCP) area. The deposits formed during Upper Cretaceous-Paleogene emersion are present on the entire AdCP. One of the largest and most exploited area is the Posušje bauxite-bearing area in western Herzegovina. Geological exploration and exploitation were very intensive between 1950 and 1990, but after that time, exploration was terminated by war events. This work aimed to collect all available data, systematize them into a 3D geodatabase and construct a 3D geological model of Snižnica, one of the most complex districts in the Posušje bauxite-bearing area. The results of this work are a composite geological map, 15 geological sections, and a 3D geological model with structural-kinematic analyses in a 3D environment and 3D bauxite prospection. The structural-kinematic analyses include fault movement analyses, the thickness of Paleogene deposits, which is important for drilling planning, reconstruction of eroded part of the Paleogene deposits in the hanging wall, spatial analysis of bauxite deposit locations, and azimuth and dip angle distribution of the palaeorelief surface. The results indicate that displacements on individual faults range between 0 and 100 m, while the maximum cumulative displacement is estimated to be ≥ 250 m (Pavlin and Šegović 2022). The thickness of Paleogene deposits ranges from 0 to almost 200 m, while the thickness of the eroded part of Paleogene deposits reaches up to 100 m (Pavlin and Šegović 2022). Maps of azimuth and dip angle distribution of the palaeorelief surface and analysis of structural positions of bauxite deposits indicate that a larger number of deposits are in the anticline and syncline hinge zones, which indicates that the depressions in the palaeorelief are partly structurally predisposed (Pavlin and Šegović 2022). The constructed 3D geological model and the conducted analysis can serve as a basis for planning further exploration works, primarily drilling holes to find new bauxite deposits.

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doc. Mgr. Natália Hudáčková, PhD.
Mgr. Andrej Ruman, PhD.
doc. RNDr. Michal Šujan, PhD.

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