



Reservoir characterization of the underground gas storage “Banatski Dvor”

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The area of the “Banatski Dvor” gas field is located in the eastern Vojvodina, Srednji Banat. It is built up of Mesozoic, Tertiary and Quaternary sediments. Pontian sandstones and sands are the main gas bearing formations of the “Banatski Dvor” structure. The Lower Pontian sandstone horizon bears gas reservoir “A” (gas storage). Petrophysical properties of the reservoir rocks are very important for development of the underground gas storage project. In the area of the underground gas storage 3D seismic survey was designed to get detailed structural model of the reservoir “A” and petrophysical parameters. 3D seismic data were inverted in acoustic impedance on the basis of the well logging data. One of the most important procedure in reservoir characterization is seismic to well tie. Accurate synthetic seismograms were created using elastic modeling from P, S and density logs. Wavelet was extracted from seismic data near the well. A background model is required and very involved in the amplitude inversion process. A good and detailed background model can largely enhance the accuracy of the inversion results. Data from eighteen wells were used to create density and P-wave velocity model. 3D ordinary kriging method was used to create well based background models. Amplitude inversion is a procedure that converts seismic traces to impedances. Constrained Inversion in Eigenvectors basis was used as a method for the amplitude inversion. Petrophysical parameters of the reservoir “A” were estimated based on the interpretation of the acoustic impedance volume and the well logging data. Results of the interpretation the acoustic impedance volume and the well logging data served to estimate following petrophysical parameters: porosity, permeability, water saturation and volume of shale content. The results were very satisfactory and were used for the volume estimation of the gas storage.