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Creating Structural Model of V Oil Deposit, Pannonian Basin, Serbia and Montenegro

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V oil deposit is located in Pannonian basin, at the NE part of Vojvodina. The deposit is famous bz the highest oil production in Serbia and Montenegro. According to stratigraphic classification of deposits, the V deposit is of Lower Pontian origin.

Structure V was formed as compact anticline, as a result of sedimentation over differently descended blocks. Within the core of the anticline, metamorphites (schists) are present, Mesozoic dolomites limestones, with Tertiary sediments over. Six faults, important for the present form of V structure, are noticable. Fault R1 is of the first rank, of Lower Pontian origin, serving as a barrier during migration, that is accumulation of hydrocarbons (Fig1.)

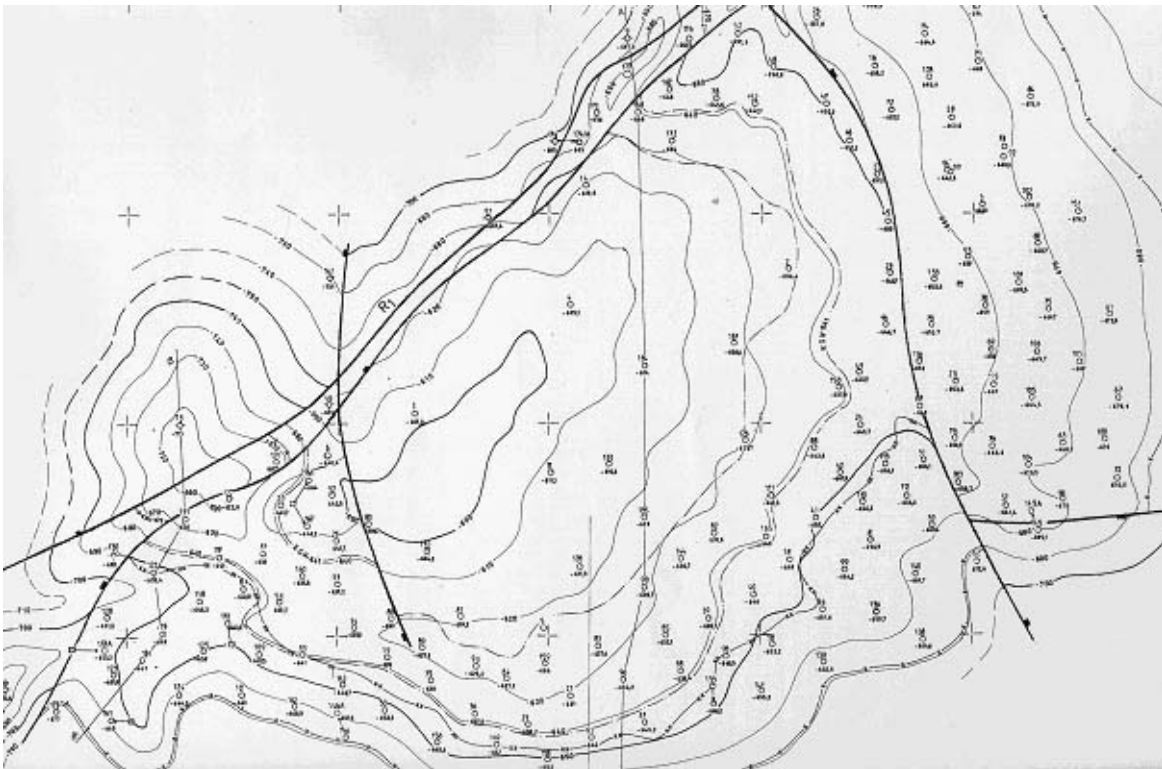


Figure 1.

Oil field with gas cap V is main hydrocarbon reservoir, with Triassic (limestones and dolomites) and Lower Pontian (sand and sandstones) collectors.

Sand and cohesionless sandstones are predominantly disturbed, serving as hydrocarbon collectors. The formations are made of surrounded quartz grains and a low content of feldspar and chlorite. Because of low content of carbonate substance (approx. 6%), they are very loose. Referring to the grain size, they are predominantly consisted of sandy component (0.1-0.5 mm). Sediments are well sorted, with grains of the same diameter, improving features of the collector. Average porosity of the collectors is almost 0.030 d.j. Average efficient thickness of the oil zone in the northern part of the «V» field is approx. 16m.

In order to produce as larger oil quantities as possible, and to enlarge reserves, geological model of the V deposit is created.

Bz creating the structural model of the deposit, certain markers suggesting continuation of the work on outlining and defining the space distribution of the deposit in both directions, are obtained. The model integrates geological data and makes their analysis from the viewpoint of production - so processed data are inserted into models for economical analysis. In that way, the basis for determining optimal strategic solutions in the stage of defining the most optimal way for the deposit management. Because of the fact that each hydrocarbon deposit unique, necessity of multidisciplinary analysis in time and space is expressed.

The V deposit, as a main carrer of hydrocarbons at the V oil-gas field, has been exploited for 35 years. The deposit has not outlined yet after so long period, even in domain of R1 fault (Fig.2).

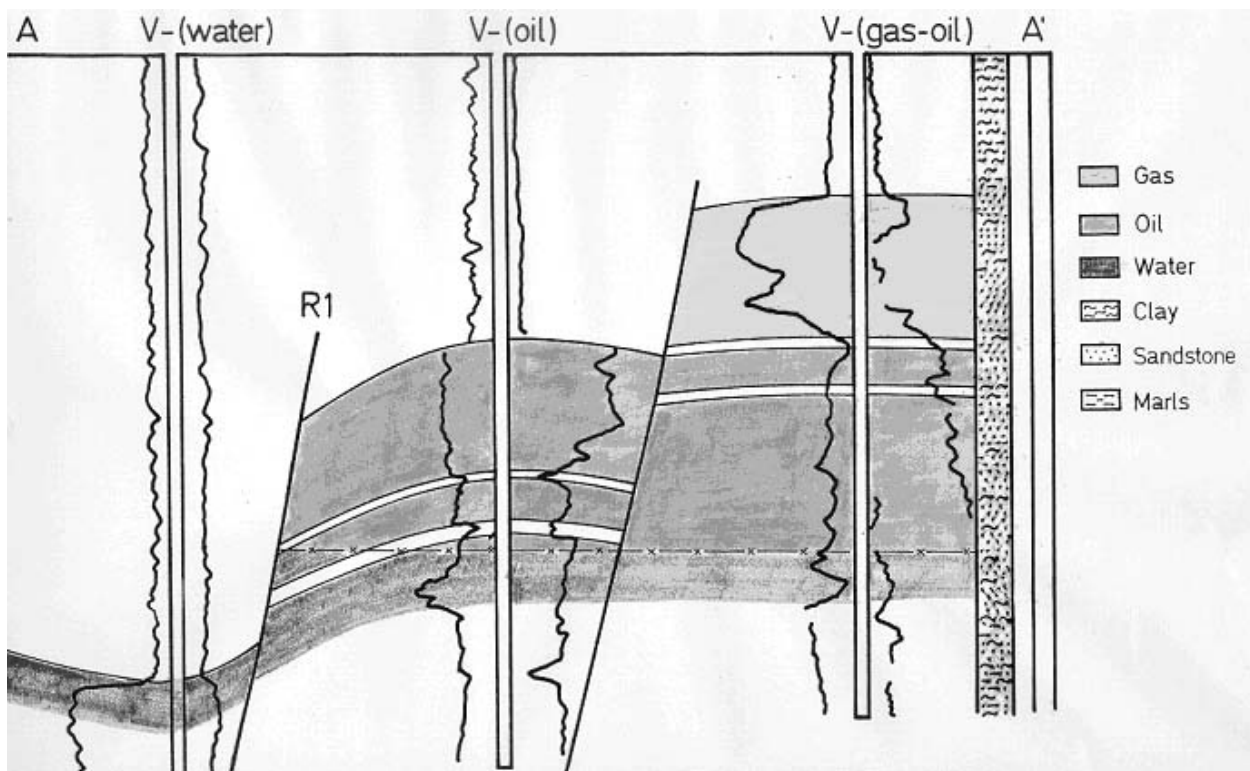


Figure 2.

On the basis of complex analysis of geological data from new boreholes (V- 162, V-168,V-169, V-173, V-174A V-175, V-176 and V-177), as well as of detailed interpretation of 3D seismics, the northern part of the V deposit has been outlined in domain of the R1 fault. The southern part of the deposit in domain of the R1 fault is not completely outlined, but after interpretation of 3D seismics, there are some indications that the fault trace is more in northern direction, which is expected to be justified by new boreholes.

Very important data for creating the newest geological model of the deposit have been obtained from the following boreholes:V-162, V-168 and V-171. The mentioned boreholes penetrated local max values at the V deposit, in other words, efficient thickness of the oil zone within range has been distinguished. On the contrary, by the previous geological interpretation at the cited localities, much lower depth values are defined. Identification of local max values at the V deposit should be the priority in the future, too, because the boreholes V-162 and V-168 are in the moment the most productive oil boreholes in the deposit.

The southwestern part of the deposit is defined by the borehole V161, while the northeastern one - by V-175, so, all these parts of the V deposit could be defined as outlined (Fig.1).

At the northern part of the deposit, in domain of the R1 fault, separated block was distinguished. Within the block, oil-water contact was determined (borehole V-173) 1.5 m deeper than in the other parts of the V deposit.

The V-172 borehole penetrated only gas cap of the V deposit and significantly defined position of the gas cap in the northern part of the deposit.

The cited arguments are verification that creating of the structural model of the deposit is very complex and serious job. Although the newest geological model was defined several months ago, it is under permanent construction, that is - geological reinterpretation on the basis of data analysis from new boreholes, as well as interpretation of all available seismic lines. Precise and high-quality geological model of the V deposit will make the mentioned deposit to be the most productive oil deposit.