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The Studying For Thin Interbed Architecture of Burial Meandering Channel Point Bar

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Abstract: Taking a certain dense pattern test area in Daqing oil field as an example, the use of small layer contrast, sedimentary microfacies and single sand identification technology, combined with modern sedimentary model and the outcrop research results and cores, referred to c logging and dynamic data and empirical formula, densely well pattern anatomy and dyad well analysis, summed up internal architecture model of the point bar in the study area. And under the guidance of the model, the author provides the basis for further tapping the potential and development in oil field.
Keywords: Architecture; point bar; Daqing oil field; lateral accretion interlayer.

INTRODUCTIN

Daqing oil field after 50 years of development, oil field water cut rate has reached as high as 90%. Because of the serious imbalance and residual oil reserve production structure of highly dispersed, underground sand body architecture is particularly important. Meandering distributary channel point bar lateral accretion is an impermeable barrier. It directly affects the connectivity of sand bodies and the effect of injection and production. It is important to control the remaining oil reserves of potential target [1]. However, single sand body internal lateral accretion interlayer has the characteristics of thin, small scale, not stable distribution, not contrasted from well to well, not identified by seismic data [2]. It is difficult to study the internal architecture structure of the reservoir.

QUANTITATIVE DESCRIPTION TO INTERNAL ARCHITECTURE MODEL OF THE POINT BAR

Point bar formation process can be simply described as "etchback increasing convex" that one-way circulation erosion concave material, and its migration to convex deposition process, the dam is river of lateral migration of product. [3-4], the point bar sand body is composed of two parts, the lateral accretion bodies and lateral accretion interlayers. A lateral accretion body is a flood event deposits, which is the basic unit of the point bar architecture. Lateral accretion is the end of the flood, water power weakened, in the side of the sand body on the deposition, the formation of a thin layer of mud sediment, is a separate side sand body caused by a single sand body internal heterogeneity of the important elements of the unit. Its distribution size, inclination and dip angle are the key elements of the configuration of the point bar.

Determination of lateral accretion interlayer's size

Taking the small layer of the split plain II7+8a as an example (Fig. 1), the point bar is identified through the analysis of the abandoned channel identification and the plane sedimentary microfacies. According to the Schumm formula, Chinese Academy of Sciences formula and Leopold river engineering formula , the calculated values of the abandoned channel bank-full width are 50.6m,50.1m and 56.4m respectively in the SII7+8a layer. Because the three values are very close, the average value is 52.3m. Through the Ethridge formula [5], lateral accretion body plane maximum width is WL=52.3 *2/ 3=34.9m. Because the lateral accretion interlayer is at the top of lateral accretion bodies and vulnerably is eroded the next flood erosion, its maximum width is usually less than the width of lateral accretion. Therefore, the point bar internal lateral accretion shale interlayer maximum width is 34.9m, usually less than 34.9m.

Determination of lateral accretion interlayer's inclination

According to the plane distribution of abandoned channel and point bar, lateral accretion interlayer's' inclination of the point bar is 291.

Determination of lateral accretion interlayer's dip angle

According to a very close distance (generally less than 50m) of the sub wells, can determine the top surface of the sandwich. In the SII7+8a deposition time unit of the point of the dam to find such a pair of wells, the calculation of the dip angle of accretion interlayer is 5 degrees to 8 degrees.

Determination of lateral accretion interlayer's extension length and density

Well logging interpretation data statistics show that in point bar the thickness of lateral accretion is 3.5m, the thinnest 0.1m, average 3.49m. The channel sand is 5.1m thick, the thinnest 2.5m. By extending the length of interlayer L= (2/3) h/sinα (αis interlayer's dip angle and h is the average thickness of the channel sand body); interlayer's density ρ=tanα/ d (d is the average thickness of lateral accretion body). Empirical formula can calculate the length of the interlayer extension in 16.72m ~ 26.7m; the interlayer density is 0.089 number /m ~ 0.143 numbers /m.

Establishment of internal architecture model of point bar

The dip angle of the sandwich layer is 291 degrees, the dip angle is 8 degrees, the density of the sandwich is 0.143 / m, and the length of the 16.72m is used as the parameter to draw the plane and profile of the point bar (Fig 1, Fig 2). According to the micro electrode curve, deep, shallow lateral curve, natural gamma curve and natural potential curve, the degree of their return will be divided into two categories. Green line for stable interlayers, blue dashed for the prediction of interlayers.

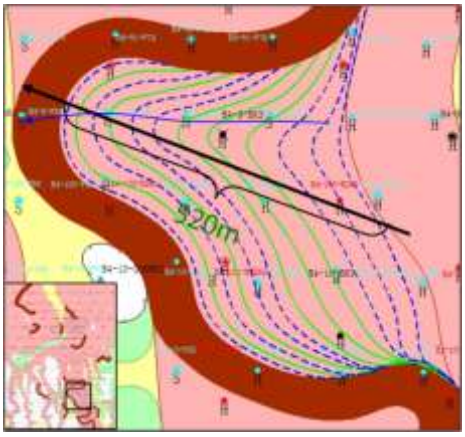

Fig. 1: The plan of SII7+8a plane microfacies and distribution of interlayer in point bar

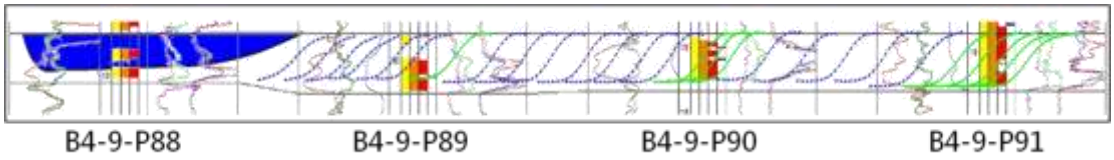

Fig. 2: The profile of SII7+8a plane microfacies and distribution of interlayer in point bar

CONCLUSION

With the help of modern knowledge of sedimentary and outcrop studies, based on detailed analysis of sedimentary model of meandering river point bar, I identify that I can analysis the internal architecture of point bar in the research area of dense well network. Through the SII7+8a layer in point bar analysis, I identify lateral accretion interlayer of the dam in the section is imbricate arrangement. The late side integrated with a certain angle stacked in the early stage of lateral accretion body and formed a series of inclined concave echelon arrangement of sand body.

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