

# Exploration Theory and Technology of Buried Hills in Western South Turgay Basin\*

Qiyang Li<sup>1</sup>, Mingjun Zhang<sup>1</sup>, Jianjun Guo<sup>1</sup>, Wei Yin<sup>1</sup>, and Xiaofeng Sheng<sup>1</sup>

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<sup>1</sup>Dept. of Central Asia & Russia E&P, Research Institute of Petroleum Exploration & Development, PetroChina, Beijing, China ([liqiyang@petrochina.com.cn](mailto:liqiyang@petrochina.com.cn))

## Abstract

For increasing reserve and production, deep complex buried hills become realistic exploration fields in South Turgay Basin, which is a mature Mesozoic rift basin in central Kazakhstan (Korchagin and Pauzanova, 1996) (Figure 1). In the practice of the Karaganda block exploration in the north basin, a set of petroleum exploration theories and technology have been developed, and many targets have been successfully drilled. Petroleum in the buried hills has been becoming an important alternative to the current reserves. In the aspect of theory, reservoir response models and hydrocarbon pool formation and distribution rules for buried hills are developed. In the aspect of technology, prediction methods of hydrocarbon-bearing pools in the buried hills are proposed. These are aided by many advanced technologies (Zeng et al, 1998a; Zeng et al, 1998b; Zeng and Backus, 2005a; Zeng and Backus, 2005b), such as three dimensional seismic visualized interpretation (Figure 2, Figure 3, Figure 4), pre-stack and post-stack reservoir inversion (Figure 3), and hydrocarbon fluid inspection. These methods include tectonic characteristics and effective trap identification (Figure 2, Figure 3, Figure 4), reservoir heterogeneity characterization (Figure 2, Figure 3), advantageous reservoir areas prediction (Figure 3), and hydrocarbon fluid inspection. By applying the petroleum exploration theory and technology in buried hills, great breakthroughs are made in Karabulak-2 buried hill traps, West Karabulak drape anticline traps and stratigraphic overlap traps exploration (Figure 4). This is significantly important for the whole basin exploration in buried hills.

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Figure 1. The location map of the South Turgay Basin.

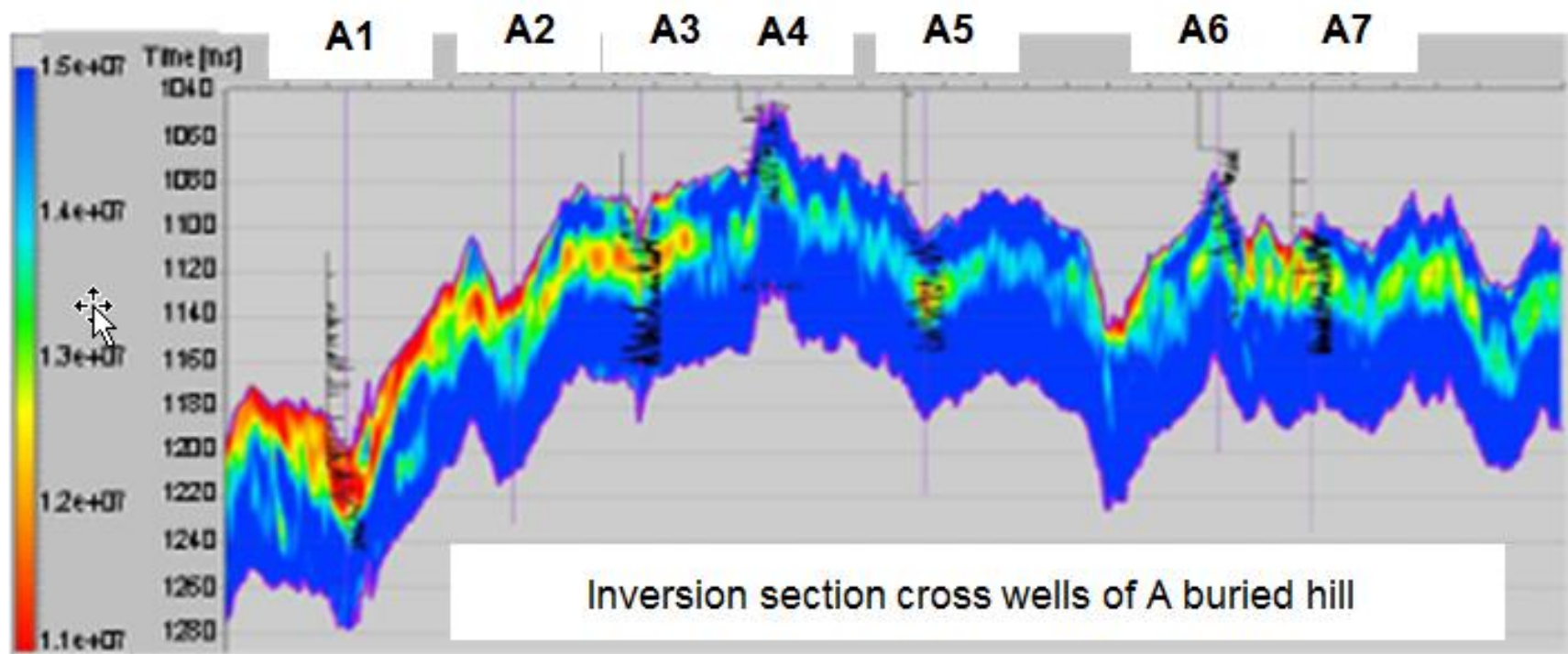


Figure 2. The inversion cross section wells of buried map of the South Turgay Basin.



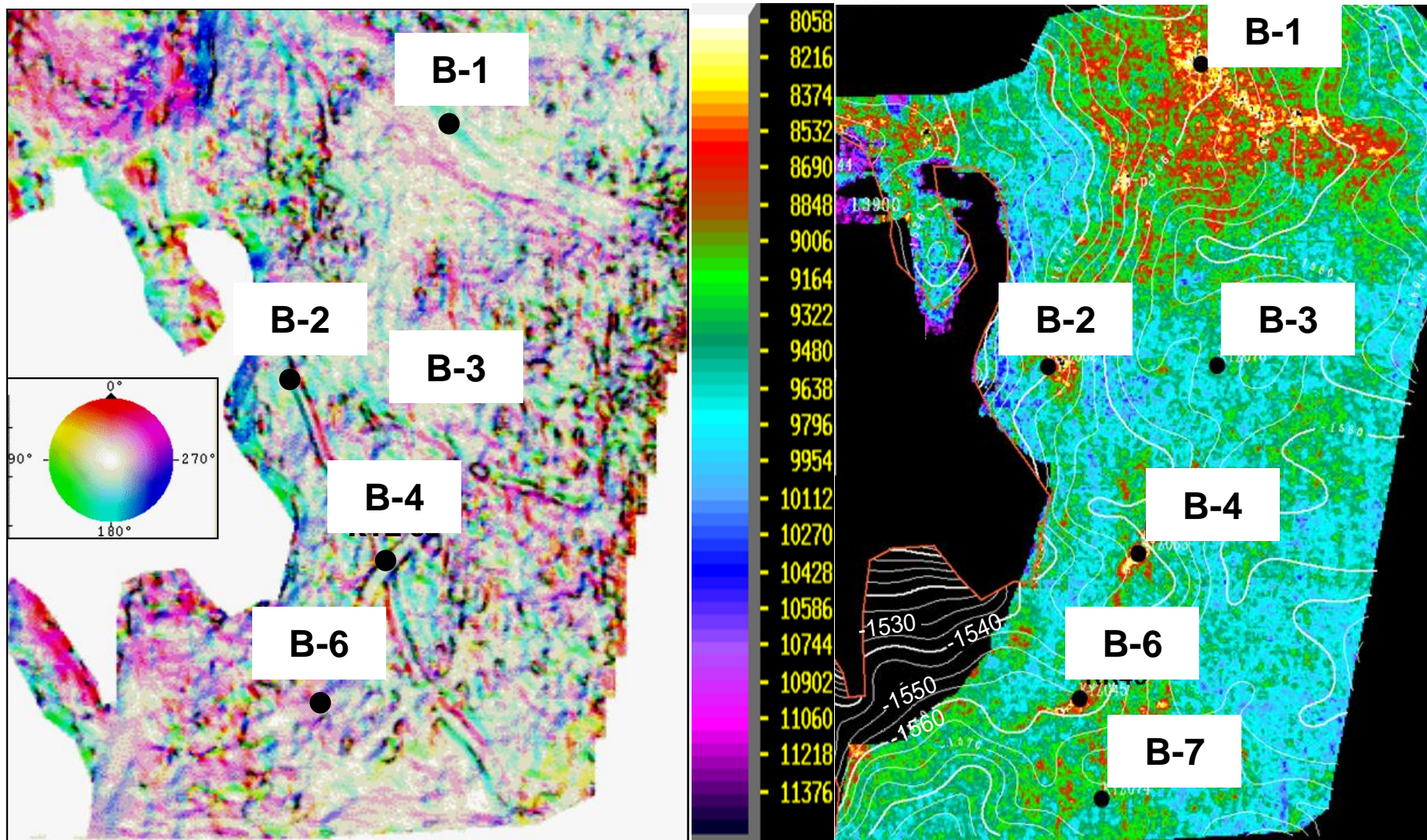


Figure 3. The RMS attributes map of block B of the South Turgay Basin.

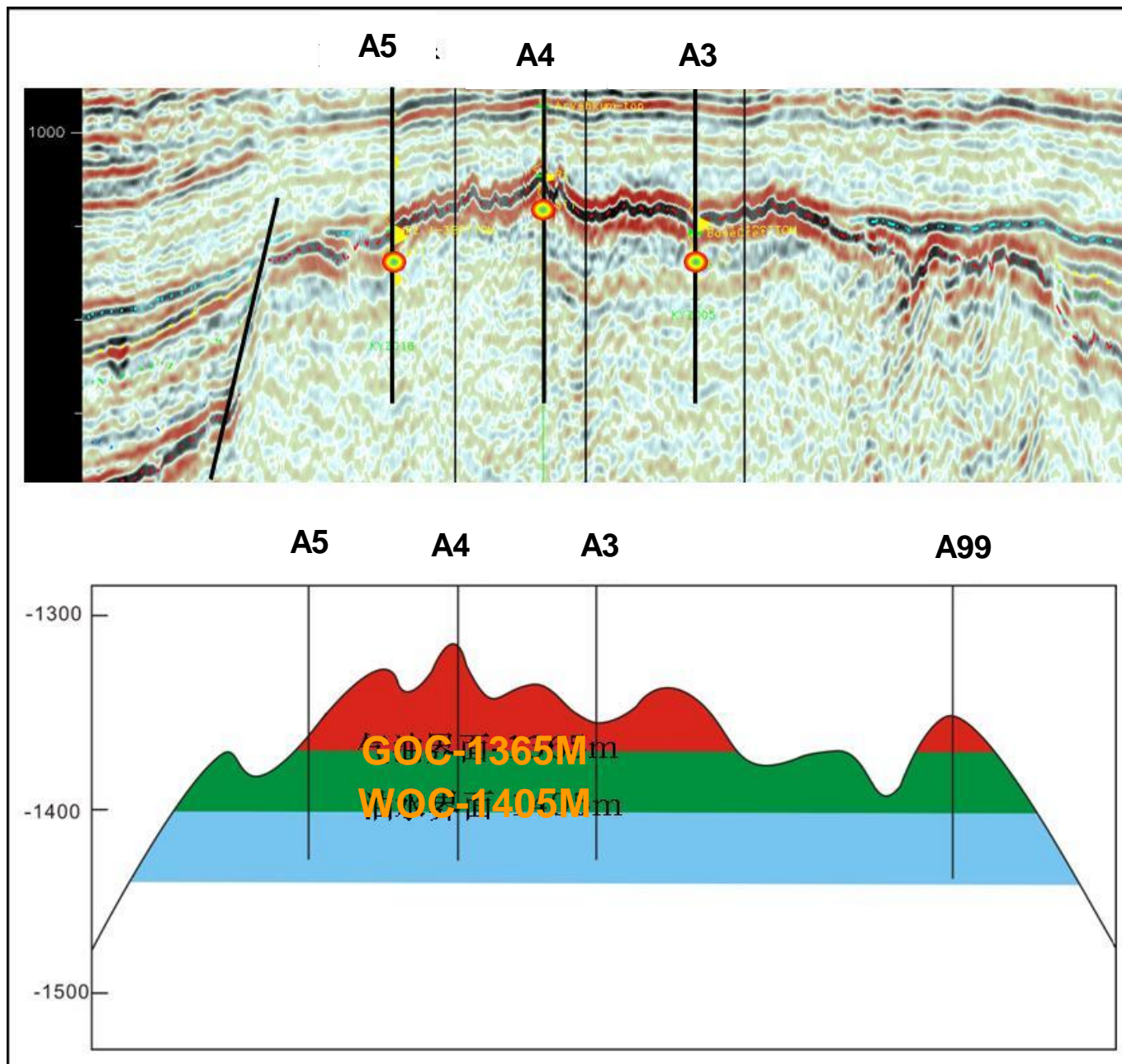


Figure 4. The reservoir map of cross section wells of buried map of the South Turgay Basin.