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Hydrothermal fluid system geological history and its influence on oil and gas rock complex, West Siberia, Russia.

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Bazhenov formation is the richest and principal oil shale formation in Russia, which covers the majority of the West Siberian oil fields.

Reservoirs within upper part of Abalak and Bazhenov formations are often associated with secondary altered rocks. According to the results of lithological, mineralogical, isotopic studies of cores, hydrothermal reworking of the deposits took place in past, leading to the precipitation of specific mineral associations, changes in porosity and permeability, organic matter thermal alterations. Two main phases of hydrothermal activity can be distinguished. The first one – sedimentary, took place when the deposits were not consolidated - the analogue of modern methane seeps on the Sea floor. This phase is characterized by precipitation of authigenic carbonates, as well as precipitation of barite, framboidal pyrite. The second phase took place when the rocks were already consolidated – high-temperature deep fluids migrated from underneath strata along weak zones (faults), reached different levels within the Abalak-Bazhenov complex and reworked the rocks with change of its mineral composition, porosity and organic matter maturity.

As a result of the various deep fluid systems impact two main mechanisms take place: a) formation of secondary reservoirs due to the leaching processes b) zones of secondary hydrothermal mineralization with signs of seal. The latter have an inhomogeneous and patchy character of distribution vertically and laterally. And when they are exposed to later aggressive fluids, their reservoir properties may be improved.

The objective of present research is to find integrated lithological, mineralogical, isotopic evidence of deep hydrothermal fluids influence on the rocks of Bazhen-Abalak complex and characterize development history of these processes. These studies allow to predict both prospecting intervals of oil and gas generation and secondary porous reservoirs for industrial exploration.