CONTENTS

OIL AND GAS PROSPECTING

Bolshakov Yu. Yu. The nature of commercial oil and gas content of bazhenov suite ................................................................. 4

Kolotovkina M. Yu., Nikulin E. V. Facial zoning of vendian productive deposits using pyrolysis and core data, seismic survey with Omorin licence block taken as an example .................................................. 9

Druzinin V. S., Nachapkin N. I., Osipov V. Yu. Some information about lower archean crystal foundation of Euro-asian continent .......... 14

Rile E. B., Popova M. N. Three-strata hydrocarbon reservoirs of Volga-Ural south-west territory and their oil and gas potential ............ 25

Nogotkov V. S. Assessment of collector properties of lower cretaceous sediments within the limits of eastern dipping of Stavropolsky bending fold of the central Pre-Caucasian region ........................................ 34

Bochkarev V. A., Bochkarev A. V., Gorbachev S. D. The role of fractures and faults in the process of formation of a complex fault-block structures of oil fields (concession WEEM in Egypt) ......................... 36

Kokh A. A. Groundwater composition features of the neocomian hydrogeological complex, western part of Khatanga artesian basin .......... 45

Sadykova Ya. V. Paleohydrodynamical reconstructions of upper jurassic deposits located in the southern areas of Ob-Irtysh interfluve .......... 54

DEVELOPMENT OF OIL AND GAS FIELDS

Fattakhov I. G. Backgrounds of using heat obtained during associated oil gas burning for injected water heating in winter time .............. 61

Information on the articles ......................................................................................................................... 68
THE NATURE OF COMMERCIAL OIL AND GAS CONTENT OF BAZHENOV SUITE (p. 4)

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Bazhenov suite is the major source of unconventional oil source in Russia having very significant oil resources. However, the conditions of oil and gas accumulation in the thickness are still not clear thus greatly complicating prospecting, exploration and estimation of oil reserves in Bazhenov suite. The paper proposes a model of oil reserves generation in the suite, based on the study of physical and chemical conditions that occur in clay strata while their compacting with lagging behind drainage, which leads to formation of abnormally high formation pressure (AHFP) and clay plate collectors, saturated by water inside clay strata, thus promoting oil migration and accumulation in anticlinal traps. In due time water is replaced out of a productive clay strata and oil deposits become hydraulically closed. Significant role in formation of oil reservoirs and deposits belongs to syneresis, electrical-capillary phenomena, molecular forces and electric potentials. Some possible method of oil deposits prospecting and exploration in Bazhenov series is suggested.

Key words: plunging mode; abnormally high formation pressure (AHFP); oil; Bazhenov series; Kuonamskaya series; clays; compacting with lagging behind drainage; hydrophilic property; hydrophobic property; syneresis; colloidal solution; physical-chemical potential; electrical potential; electrical-capillary phenomena; molecular forces; paleo-elevations; neo-tectonics; prospecting; exploration.

SOME INFORMATION ABOUT LOWER ARCHEAN CRYSTAL FOUNDATION OF EURO-ASIAN CONTINENT (p. 14)

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The information on super-deep boreholes and results of DSS (Deep Seismic Sounding) researches is considered. The assumption of practically universal presence of the ancient Archean crystal foundation with the persistent physical parameters at the Euro-Asian continent is made on the basis of the above-mentioned data. The bottom of K01 – the first floor earth’s crust – cor-
responds to the ancient Archean crystal foundation at seismic-geological sections, made by a deep geomap technique application. The problem is more thoroughly discussed for the West-Siberian sedimentary super basin.

Key words: Euro-Asian continent; ancient Archean crystal foundation.

UDC 553.98(470.4/.5)

THREE-STRATA HYDROCARBON RESERVOIRS OF VOLGA-URAL SOUTH-WEST TERRITORY AND THEIR OIL & GAS POTENTIAL (p. 25)

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Analysis of structure and oil-and-gas potential of south-western part of Volga-Ural oil- and gas-bearing province (OGBP) was executed in the view of three-strata reservoirs theory. Division of sedimentary cover into natural reservoirs but not into oil- and gas-bearing complexes allows considerable specifying of the criteria of oil- and gas-bearing prediction and, respectively, increasing of exploration activity success.

Key words: three-strata natural reservoirs; genuine seal; false seal; oil- and gas-bearing complexes; hydrocarbons; deposit.

UDC 553.98(470.63)

ASSESSMENT OF COLLECTOR PROPERTIES OF LOWER CRETACEOUS SEDIMENTS WITHIN THE LIMITS OF EASTERN DIPPING OF STAVROPOLSKY BENDING FOLD OF THE CENTRAL PRE-CAUCASIAN REGION (p. 34)

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Borders of complex shielding traps depend on the degree of certainty with which the area of rocks-collectors lithologic replacement is defined. In case of granular-type rocks-collectors the boundary of collector rock is defined by a reservoir clay content. Clay minerals in sedimentary rocks are normally present in a finely-dispersed state and have great specific surface, which adsorbs water molecules forming a layer of water with anomalous properties. Abnormal layers have a significant effect on physical properties of a clay collector, causing their difference from corresponding properties of a pure collector. Clay minerals contain chemically bound water in crystal lattice, radioactive elements in the lattice and those adsorbed on the surface. From these characteristics of clay minerals with a noticeable content of their manifold largely dependent Neutron properties and rock natural radioactivity essentially depend on the above-mentioned properties of clay minerals when their presence in a collector is rather high. Clay minerals, being present in a collector, due to the marked-above specific features have quite significant influence on collector properties and water saturation as well as on the nature of the correlations among geophysical, geological and calculating parameters. Information about clay content and porosity makes it possible to find out whether the reservoir rock is a collector while for a collector to estimate permeability, marginal effective porosity and bound water content. Data on clay provides correction of geophysical methods readings and correlation and dependences, taking into account the clay content of a collector, are used while determining coefficients of porosity and oil and gas saturation. Classification of Lower Cretaceous silt-to sand collectors of eastern dipping of Stavropol bending fold is justified to identify productive strata. Some criteria of collectors’ identification with account of boundary values of porosity and permeability are proposed.

Key words: porosity; permeability; clay content; filtration-volumetric properties; rock-collector; lithologic replacement; core material; fluid.

UDC 553.98(2/.9) + 550.834

THE ROLE OF FRACTURES AND FAULTS IN THE PROCESS OF FORMATION OF A COMPLEX FAULT-BLOCK STRUCTURES OF OIL FIELDS (CONCESSION WEEM IN EGYPT) (p. 36)

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The article shows the role of fractures and faults in the process of formation of a complex fault-block structures of oil fields (concession WEEM in Egypt) and normal-fault traps as well as the possibility of solving real practical problems of their exploration and development with account of the detected position and inclination of the fault plane.

Key words: genesis of rifts; fault; shift fault; graben; horst; complex fault-block structure; fault seal.

UDC 556.3(571.5)

GROUNDWATER COMPOSITION FEATURES OF THE NEOCOMIAN HYDROGEOLOGICAL COMPLEX, WESTERN PART OF KHATANGA ARTESIAN BASIN (p. 45)

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Results of investigation of hydrogeology and hydro-geochemical specific features of underground waters of the Neocomian hydro-geological complex, located in the western part of Khatanga artesian basin are presented. The main geochemical features of groundwater composition change are revealed. Inverse
type of vertical hydro-geochemical zoning is determined. Groundwater genetic types are preliminary identified within the limits of the area under study.

Key words: hydro-geochemistry; groundwater; the Neocomian deposits; Khatanga artesian basin.

UDC 553.98:556.3 (571.511)

PALEOHYDRODYNAMICAL RECONSTRUCTIONS OF UPPER JURASSIC DEPOSITS LOCATED IN THE SOUTHERN AREAS OF OB-IRTYSH INTERFLUVE (p. 54)

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Some results of paleo-hydrodynamical reconstructions of the Upper Jurassic hydro-geological complex, located in Ob-Irtysh interfluve of the West Siberian mega-basin, are presented. The spatial interrelation of the water-bearing and waterproof horizons is proved, areas of the groundwater internal recharge and cryptic discharge are revealed, the main directions of fluid movements are shown. Elision water volumes, squeezed out from the Upper Jurassic clayey deposits, are calculated. Possible mechanisms of the groundwater discharge are described. Most likely zones of hydrocarbon generation and accumulation are marked.

Key words: connate waters; elision water exchange; paleo-hydrodynamical reconstructions; the Upper Jurassic hydro-geo-

UDC 622.276.1/4+665.612.2

BACKGROUND OF USING HEAT OBTAINED DURING ASSOCIATED OIL GAS BURNING FOR INJECTED WATER HEATING IN WINTER TIME (p. 61)

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The paper considers the problem of prevention of water-supply lines freezing during their operation in winter time on the territory of the Republic of Tatarstan. Calculations of the heat volume required for heating water up to 10°C in water-supply lines, used for injection water in the system of a formation pressure maintenance, and calculated volumes of associated oil gas that must be burnt out to produce required heat are presented. Calculation of the temperature distribution in the water-supply line of 1 km long with various liquid flow-rate (100, 200, 300 m³/day) and with various winter ambient temperature (–10, –20, –30 °C) is given as an example. Calculations prove the fact that even in the worst case, the complete freezing will happen at the coordinate of about 1,5 km. The calculations were performed by applying Estaing software, written by the author. Recommendations, based on the results of work, are submitted.

Key words: water-supply line; software; heat; calculation; freezing; heating.