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Structural and tectonic features and oil and gas potential of the Cretaceous deposits of the Bukhara-Khiva region

¹G.S. Abdullaev, ²T.Kh. Shoimurotov, ³I.N. Khakimzyanov, ²S.S. Yusupkhodzhaev,
²A.Zh. Khodzhiev, ²Z.O. Omonboev

¹PETROMARUZ UZBEKISTAN LLC, Tashkent, Uzbekistan

²State Institution «Institute of Geology and Exploration of Oil and Gas Fields»
of the Ministry of Mining and Geology, Tashkent, Uzbekistan

³TatNIPIneft Institute – PJSC TATNEFT, Almetievsk, Russia

E-mail: shoymurotov.tuychi@mail.ru

Abstract. The article examines the geological prerequisites for the oil and gas potential of the Cretaceous deposits of the Bukhara-Khiva oil and gas region (BKHOGR), one of the most promising and, at the same time, poorly studied regions. This necessitated a reconsideration of the oil and gas potential of the Cretaceous deposits. The relevance of this work lies in a detailed study of the geological structure of the Cretaceous deposits in the study area, a reanalysis of understudied areas, and the identification of new hydrocarbon deposits by refining previously overlooked productive horizons. The objective of the study was to identify the geological features and assess the oil and gas potential of the Cretaceous deposits of the BKHOGR. The research was conducted by analyzing and summarizing the results of previously completed geological, geophysical, and drilling work.

Key words: *Bukhara-Khiva oil and gas region, area, structure, chalk, sediments, horizon, formation, migration, hydrocarbon, deposit, potential*

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EDN SEBWGF

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Identification and integration of facies barriers in geology and development

Y.K. Zinchenko

RN-Geology Research Development LLC, Tyumen, Russia

E-mail: ykzinchenko@tnnc.rosneft.ru

Abstract. This paper presents a comprehensive methodology for identifying and integrating facies barriers into geological and hydrodynamic models of the Jurassic formations in Western Siberia. Conventional approaches overlook silicate-filled channels, leading to errors in structural mapping and drilling failures. A five-stage approach has been implemented, combining seismofacies analysis, GIS data, GDIS results, and machine-learning techniques based on Kohonen maps. The constructed probability cube of the collector and the discrete regional cube allowed for the incorporation of facies barriers, justification of blocks with varying VNK and reservoir pressure, and improved the accuracy of hydrodynamic model adaptation by 10 %. Practical application of the method prevented drilling into non-collector zones, increased the production rate of new wells by 3.5-fold, and confirmed the feasibility of scaling the approach.

Key words: *Facies barriers, seismic facies analysis and wavefield spectral decomposition, machine learning, IP-Seismic, differential compaction, reservoir simulation (hydrodynamic modeling), Western Siberia, Jurassic deposits, bottomhole pressure gauges and well testing, water-oil contact (WOC) and hydrodynamic regions*

For citation: Y.K. Zinchenko Vyyavleniye i integratsiya fatsial'nykh bar'yerov v geologiyu i razrabotku [Identification and integration of facies barriers in geology and development]. Neftyanaya Provintsiya, No. 3(47), 2026. pp. 23-36. DOI <https://doi.org/10.25689/NP.2026.3.23-36>. EDN SEBWGF (in Russian)

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Automated selection of variogram models and their parameters for kriging-based geological mapping

¹R.Z. Sattarov, ²A.R. Sattarova

¹*TatNIPIneft Institute – PJSC TATNEFT, Almetievsk, Russia*

²*Institute of Computational Mathematics and Information Technologies,
Kazan (Volga region) Federal University, Kazan, Russia*

E-mail: ramsat@tatnipi.ru

Abstract. The paper describes an algorithm designed for the automated selection of an appropriate variogram model and its parameters in multiple directions for geological mapping via the kriging method. Traditional manual variogram fitting is subjective and time-consuming, particularly in cases of pronounced spatial anisotropy of reservoir properties. The developed algorithm automatically analyzes experimental data, selects the optimal theoretical model type, and calculates its parameters based on the least-squares criterion. The effectiveness of this approach is validated through the simulation of the porosity parameter within a productive horizon. The implementation of the algorithm enables the automation of routine geostatistical analysis operations and enhances the prediction accuracy for interwell space.

Key words: *geostatistics, variogram, nugget, range, sill, variogram analysis, spatial interpolation, kriging, geological mapping*

For citation: R.Z. Sattarov, A.R. Sattarova Avtomatizirovanny podbor modeley variogrammm i ikh parametrov dlya postroyeniya geologicheskikh kart metodom kriginga [Automated selection of variogram models and their parameters for kriging-based geological mapping]. Neftyanaya Provintsiya, No. 3(47), 2026. pp. 37-51. DOI <https://doi.org/10.25689/NP.2026.3.37-51>. EDN TRZXLS (in Russian)

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EDN WKBSSR

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**Facies-driven strategy for further exploration and development
of complex terrigenous deposits of the Bobrikovsky horizon:
A case study of the Block 024 in the marginal zone
of the Romashkino field, Republic of Tatarstan**

¹T.A. Safiullin, ¹A.A. Nazarov, ¹V.A. Dekhtyrev, ¹E.K. Siraev, ^{2,3}V.A. Lagutaev

¹TatNIPIneft Institute – PJSC TATNEFT, Almetievsk, Russia

²LLC LUKOIL-Technologies, Moscow, Russia

³Almetyevsk State Technological University – Higher School of Petroleum,
Almetyevsk, Russia

E-mail: SafiullinTA@tatneft.ru

Abstract. This paper presents a detailed facies analysis and a technical justification for the development strategy of the Bobrikovsky horizon (C_{1br}) within Block 024, located in the marginal zone of the Romashkino field (Republic of Tatarstan). Drawing on data from 23 wells, the study integrates three independent classification methods: Muromtsev's morphological analysis of SP curves, GR curve motif analysis according to Nazeer et al., and cross-plot analysis of reservoir properties. The findings indicate that the horizon was formed by a meandering alluvial system, within which five distinct facies types were identified. A key geological contribution of this work is the documentation of lateral paleochannel migration between individual reservoir units. By combining this facies model with hydrodynamic parameters, we propose a conceptual development framework. The strategy involves positioning production wells along the stable axis of the paleochannel, while implementing a combined pressure maintenance system that integrates edge waterflooding with intra-channel injection. This approach creates hydrodynamic support and is expected to improve displacement front control; the proposed scheme is conceptual and requires verification against actual field performance data.

Key words: *Bobrikovsky horizon, facies analysis, paleochannel migration, reservoir heterogeneity, mobility ratio, pressure maintenance system (PMS), intra-channel injection, Romashkino field*

For citation: T.A. Safiullin, A.A. Nazarov, V.A. Dekhtyrev, E.K. Siraev, V.A. Lagutaev Fatsial'no-oriyentirovannaya strategiya dorazvedki i razrabotki slozhnopostroyennykh terrigennykh za-lezhey bobrikovskogo gorizonta (na primere bloka **024 v krayevoy zone Romashkinskogo mestorozhdeniya Respubliki Tatarstan) [Facies-driven strategy for further exploration and development of complex terrigenous deposits of the Bobrikovsky horizon: A case study of the Block 024 in the marginal zone of the Romashkino field, Republic of Tatarstan]. Neftyanaya Provintsiya, No. 3(47), 2026. pp. 52-80. DOI <https://doi.org/10.25689/NP.2026.3.52-80>. EDN WKBSSR (in Russian)

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EDN YGUBMY

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Method for express water saturation modeling using the Leverett J-function for reservoir simulation of multilayer oilfields

E.V. Kuzmina, S.A. Kadyaev, D.M. Gazizova

TatNIPIneft Institute – PJSC TATNEFT, Almetievsk, Russia

Almetyevsk State Technological University – Higher School of Petroleum, Almetyevsk, Russia

E-mail: KuzminaEV@tatneft.tatar

Abstract. This paper presents a method for express water saturation cube generation based on the Leverett J-function for reservoir simulation of multilayer and multipay oilfields. The proposed approach uses region-specific tables of capillary pressure obtained as a result of capillarimetric studies of core material and allows consideration of the heterogeneity of reservoir properties as well as variability of physical and chemical properties of fluids in various production zones. The main advantage of the proposed method is a high calculation speed – a full cycle including water saturation cube generation, evaluation of initial oil-in-place and mobile oil, takes about 15 s, which is more than 100 times faster than the standard model initialization. The comparison of the results with well log data and the initialized model confirmed the validity of the obtained distributions. The method enables multivariate calculations and quantitative uncertainty estimation in reserve assessment.

Key words: *Leverett J-function, water saturation, capillary pressure, reservoir simulation, oil reserve assessment, multilayer oilfield*

For citation: E.V. Kuzmina, S.A. Kadyaev, D.M. Gazizova Metodika ekspress-postroyeniya vodonasychennosti po J-funktsii Leveretta dlya zadach gidrodinamicheskogo modelirovaniya mnogoplastovykh mestorozhdeniy [Method for express water saturation modeling using the Leverett J-function for reservoir simulation of multilayer oilfields]. Neftyanaya Provintsiya, No. 3(47), 2026. pp. 81-94. DOI <https://doi.org/10.25689/NP.2026.3.81-94>. EDN YGUBMY (in Russian)

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EDN ZUCFCN

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Investigation of changes in reservoir fluid properties and gas saturation during oil and gas field development

R.F. Khisiev, S.A. Dolgih

*Kazan (Volga region) Federal University, Institute of Geology and Petroleum Technologies,
Kazan, Russia*

E-mail: khisiev.rf@gmail.com

Abstract. The article examines patterns of changes in reservoir fluid properties and gas saturation during oil field development. Laboratory and computational methods for determining fluid properties are systematized. Examples are used to compare traditional research methods with approaches that extend them through machine learning, consideration of two-phase fluid withdrawal, and joint interpretation of time-lapse seismic surveys and field observations. The advantages, limitations, and validation requirements are identified for each example. An integrated monitoring workflow is proposed, comprising historical data preparation, physics-based model calibration, assessment of the current reservoir state, and independent forecast validation. The need to assess the reliability of PVT parameters and gas saturation estimates separately is substantiated.

Key words: *reservoir fluids, gas saturation, PVT studies, fluid properties, machine learning, field data, oil field development monitoring*

For citation: R.F. Khisiev, S.A. Dolgih Izucheniye zakonomernostey izmeneniya svoystv plastovykh flyuidov i gazonasyshchennosti v protsesse raz-rabotki neftega-zovykh mestorozhdeniy [Investigation of changes in reservoir fluid properties and gas saturation during oil and gas field development]. Neftyanaya Provintsiya, No. 3(47), 2026. pp. 95-112. DOI <https://doi.org/10.25689/NP.2026.3.95-112>. EDN ZUCFCN (in Russian)

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EDN OGGCQW

УДК 622.276.43"5"

Case history of applying unsteady-state water-flooding in the Vikulovskaya Formation of the Krasnoleninskoye Field

¹M.D. Fedorov, ¹M.S. Zhukov, ¹D.P. Patrakov, ²K.K. Kan, ²I.N. Avsyanko

¹ RN-Geology Research Development LLC, Tyumen, Russia

² RN-Nyaganneftegaz, Nyagan, Russia

E-mail: mdfedorov@rn-gir.rosneft.ru

Abstract. Unsteady-state water-flooding is one of the methods for improving the efficiency of reservoir pressure maintenance systems. The lessons learned during transient flooding in the Vikulovskaya Formation of the Krasnoleninskoye Field were summarized, and recommendations for organizing and monitoring unsteady-state flooding operations were made. An optimized unsteady-state flooding option is proposed to minimize injection losses and reservoir pressure reduction.

Key words: *unsteady flooding, cyclic flooding, cycles, waterflooding, Vikulov Formation*

For citation: M.D. Fedorov, M.S. Zhukov, D.P. Patrakov, K.K. Kan, I.N. Avsyanko Opyt realizatsii nestatsionarnoy zakachki na plastakh Vikulovskoy svity Krasnoleninskogo mestorozhdeniya [Case History of applying unsteady-state water-flooding in the Vikulovskaya Formation of the Krasnoleninskoye Field]. Neftyanaya Provintsiya, No. 3(47), 2026. pp. 113-132. DOI <https://doi.org/10.25689/NP.2026.3.113-132>. EDN OGGCQW (in Russian)

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EDN NRPMCX

УДК 622.276.21

Method for developing an oil field with an active aquifer

V.V. Vasiliev, O.V. Salimov, I.V. Vydysch

Limited Liability Company RN-Geology Research Development (RN-GRD, LLC),

Tyumen, Russia

E-mail: ovsalimov@rn-gir.rosneft.ru

Abstract. The article presents an experimental method for developing layered arch oil deposits under a strictly water-drive regime with an active aquifer. The key technological features of developing such deposits are the early and rapid water influx into the well stock, since, often due to the small size of the deposit and strong water recharge, breakthrough to the wells occurs faster than in large development projects. This is especially relevant for deposits with underlying water – at elevated depression, water quickly migrates to the perforation interval, and consequently, there is a risk of uncontrolled water influx into the wells, which may lead to their decommissioning. The main approaches to solving this problem for small deposits involve using sparser well spacing patterns; however, this does not allow achieving the planned oil recovery factor.

Key words: *aquifer, oil field development, hydrodynamic modeling*

For citation: V.V. Vasiliev, O.V. Salimov, I.V. Vydysch Sposob razrabotki neftyanogo mestorozhdeniya s aktivnym akviferom [Method for developing an oil field with an active aquifer]. Neftyanaya Provintsiya, No. 3(47), 2026. pp. 133-141. DOI <https://doi.org/10.25689/NP.2026.3.133-141>. EDN NRPMCX (in Russian)

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EDN DTAGQQ

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Effects of chemicals and temperature on dynamics of oil globules floating up

¹N.R. Garipov, ¹Z.F. Ismagilova, ²Z.S. Faizullina, ³A.R. Gareev,
³I.G. Fattakhov

¹Almetyevsk State Technological University – Higher School of Petroleum,
Almetyevsk, Russia

²Kazan National Research Technological University, Kazan, Russia

³TatNIPIneft Institute – PJSC TATNEFT, Almetievsk, Russia

E-mail: nail.garipov@list.ru

Abstract. The paper presents results of a comprehensive study of the dynamics of floating up process of oil globules in produced water from Romashkinskoye field under various temperature conditions and with different chemicals. This study is important in view of the need to improve the efficiency of oil–water separation processes during oilfield water treatment, which directly affects water quality and the environmental performance of production operations. The experiments revealed that the efficiency of oil globules floating up process depends heavily on temperature and chemical type. Obtained data are of high practical value for petroleum industry, because they enable optimization of oilfield water treatment processes, reduction of chemical treatment costs, and improvement of water purification quality. The results of this study can be used during the design and modernization of oilfield equipment, as well as in the development of new reagent-based methods for breaking water–oil emulsions.

Key words: *oilfield water, oil globules, floating up dynamics, demulsifiers, coagulants, deoilers, coalescence*

For citation: N.R. Garipov, Z.F. Ismagilova, Z.S. Faizullina, A.R. Gareev, I.G. Fattakhov Vliyaniye khimicheskikh reagentov i temperatury na dinamiku vsplytiya neftnyanykh globul [Effects of chemicals and temperature on dynamics of oil globules floating up]. Neftyanaya Provintsiya, No. 3(47), 2026. pp. 142-171. DOI <https://doi.org/10.25689/NP.2026.3.142-171>. EDN DTAGQQ (in Russian)

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EDN ASKKAR

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Adaptation of fracturing fluids for unconventional reservoirs

A.R. Khamidi, I.I. Mannanov, J.J. Abdukhamidov, V.M. Fomina,

V.V. Andriyashin, M.A. Varfolomeev

Institute of Geology and Petroleum Technologies of Kazan (Volga Region)

Federal University (IGPT KFU), Kazan, Russia

E-mail: khamidi.alan@mail.ru

Abstract. This article examines the application of hydraulic fracturing (HF) fluids to unconventional reservoir conditions in Russia's shale formations – the Bazhenov, Abalak, and Domanik formations, characterized by ultra-low permeability, lithological heterogeneity, and anomalous pressure-temperature parameters. The relevance of this study stems from the limited effectiveness of traditional guar gels at high reservoir temperatures and high salinity. The aim of this study was to experimentally validate the optimal concentration ratios of a xanthan HF fluid to ensure a balance between rheological stability and complete gel degradation. The methodology included oscillation and rotational rheometry (Anton Paar MCR 302) and an assessment of the residual conductivity of the proppant pack according to API RP 19D. An optimal ratio of gelling agent and viscosity enhancer was established, ensuring high sand-carrying capacity at low initial viscosity (40 cP) for over 120–150 minutes. High residual proppant conductivity of 80–83% was confirmed, exceeding the generally accepted industry acceptance criterion. The practical significance of these results lies in the potential use of xanthan-based fracturing fluids in the design of multi-stage hydraulic fracturing in hard-to-recover shale reserves in Russian Federation fields.

Key words: *hydraulic fracturing, unconventional reservoirs, hard-to-recover reserves, xanthan-based hydraulic fracturing fluid, viscoelastic properties*

For citation: A.R. Khamidi, I.I. Mannanov, J.Z. Abdukhamidov, V.M. Fomina, V.V. Andriyashin, M.A. Varfolomeev Adaptatsiya zhidkostey razryva primenitel'no k netraditsionnym kollektoram [Adaptation of fracturing fluids for unconventional reservoirs]. Neftyanaya Provintsiya, No. 3(47), 2026. pp. 172-191. DOI <https://doi.org/10.25689/NP.2026.3.172-191>. EDN ASKKAR (in Russian)

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EDN ZVWBGL

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Overview of the possibilities of using aphron-containing fluids in oil and gas well drilling

E.L. Leusheva, A.O. Morozov, D.A. Russkov

Empress Catherine II Saint Petersburg Mining University, Saint Petersburg, Russia

E-mail: Leusheva_EL@pers.spmi.ru

Abstract. The paper reviews the potential application of aphron-containing drilling fluids for drilling oil and gas formations characterized by low formation pressure, fracturing and a high risk of lost circulation. Aphrons are gas microbubbles stabilized by a shell composed of surfactants, polymers and an aqueous phase; this structure enables temporary sealing of pores and microfractures, thereby reducing filtration losses and near-wellbore formation damage. The main advantages of the technology are summarized, including reduced drilling fluid density, preservation of reservoir permeability, improved cuttings transport, compatibility with conventional mixing equipment and the possibility of environmentally oriented formulation design. The limitations of aphron systems are also analyzed: thermal degradation of polymer stabilizers, sensitivity to surfactant concentration, high low-shear-rate viscosity and reduced efficiency in large-fracture reservoirs. Further development is associated with heat-resistant minerals, biodegradable surfactants, nanoparticles and adaptive formulations.

Key words: *drilling fluids, aphron systems, colloidal gas aphron, low formation pressure, filtration, lost circulation, surfactants, xanthan gum, attapulgite, thermal stability, rheology, reservoir drilling*

For citation: E.L. Leusheva, A.O. Morozov, D.A. Russkov Obzor vozmozhnosti ispol'zovaniya afron-soderzhashchikh rastvorov pri burenii neftegazovykh skvazhin [Overview of the Possibilities of Using Aphron-Containing Fluids in Oil and Gas Well Drilling]. Neftyanaya Provintsiya, No. 3(47), 2026. pp. 192-204. DOI <https://doi.org/10.25689/NP.2026.3.192-204>. EDN ZVWBGL (in Russian)

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EDN LGLGBF

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Geology graduates of Kazan University mark 55th anniversary of graduation: their contribution to geology and oil industry

M.Ya. Borovsky

Geofizservice LLC, Kazan, Russia

E-mail: micbor1913@mail.ru

Abstract. In view of the 55th anniversary of graduation from the Department of Geology of Kazan University, a contribution of graduates of 1971 has been assessed. The paper presents a list of research theses and a monographic publication of the results of their efforts in mineral reserves base expansion and replacement in the regions and republics of the Soviet Union and the Russian Federation.

Key words: *Geology graduates of 1971, Kazan University, industry, science, research theses, monograph, results of efforts, minerals, geologic and hydro-geoenvironmental research*

For citation: M.Ya. Borovsky Vypusku geologicheskogo fakul'teta 1971 goda Kazanskogo universiteta 55 let: vklad v geologicheskuyu nauku i proizvodstvo [Geology graduates of Kazan University mark 55th anniversary of graduation: their contribution to geology and oil industry]. Neftyanaya Provintsiya, No. 3(47), 2026. pp. 205-214. DOI <https://doi.org/10.25689/NP.2026.3.205-214>. EDN LGLGBF (in Russian)