SOCAR Proceedings

Oil and Gas Fields Exploration, Geology and Geophysics

journal home page: http://proceedings.socar.az

THICKNESS VARIABILITY OF DIFFERENT EOCENE LITHOFACIES IN NON-ANTICLINE TRAPS

A.M.Salmanov*[1], B.I.Maharramov[1], G.A.Abbasov[1], R.M.Huseynov[1], G.T.Abdullayeva[2]

[1]*«OilGasScientificResearchProject» Institute, SOCAR, Baku, Azerbaijan;*

[2]*Azerbaijan State Oil and Industry University, Baku, Azerbaijan*

A b s t r a c t

Thickness analysis shows that the Lower Eocene sandy horizons are distributed locally in Tovuz-Gazagh, GiragKasaman and Mammadtapa areas, and have lens-shaped morphology. This creates conditions favorable for lithological traps formation. In some areas, tuff reservoirs of the Middle Eocene age are onlapping on the local uplifts. Possability of lithological traps formation in suchareas is high. On the west part of northern zone of Kur and Gabyrry interfluve the well-sorted tuff-terrigenous rocks are predominating. It is supposed that sediments along the north - northeast border of the area will be similar to those in near Tbilisi area, and consist of fine-grained tuff-terrigenous rocks with interlayers of shale and marl. From the similar reservoirs of the Middle Eocene the oil is produced in Tarsdallar and Gurzundagh areas of Kur and Gabyrry oil-gas region.

Keywords:

Tectonics;
Lithology;
Litophase;
Structure;
Sedimentation;
Deposit;
Non-anticlinal trap;
Organic substance;
Oil-and-gas content.

© 2019 «OilGasScientificResearchProject» Institute. All rights reserved.

İntroduction

In order to increase oil and gas reserves in Azerbaijan onshore area besides exploration of anticline structures the exploration works have to be targeted on non-anticlinal traps too. The decreasing number of unexplored anticlinal structures makes this task to be an overriding.

An extensive exploration works have been conducted on anticlinal structures of Kur-Gabyrry interfluve oil-gas bearing region, but oil accumualtions were discovered only in Tarsdallar field (Middle Eocene). However, the data display good reservoir potential of the Eocene and Maikopian sediments. It requires the proper estimation of the perceptivity of Paleogene-Miocene rocks in the Kur-Gabyrry interfluve oil-gas bearing region, and right direction of the exploration woks. The paper deals with the study of the lithofacies properties of the Eocene sediments as well as occurrence of non-anticlinal traps.

**E-mail:* Ahmed.Salmanov@socar.az

http://dx.doi.org/10.5510/OGP20190200383

Eocene sediments lithofacies and thickness variability

In Gabyrry-Ajinohur sedimentation basin, including Kur-Gabyrry interfluve oil-gas bearing region the transgression started in Paleocene and progressed in Eocene with its maximum in the Middle and Upper Eocene. Transgression was accompanied by constant depression of the sea bottom. The absolute value of this depression in the central part of the basin was 1.4-1.6 cm for hundred years and 0.6-0.8 cm in the Kur-Gabyrry interfluve area. This resulted in accumulation of thick Eocene sediments in sedimentation basin [1-7]. These Eocene sediments were totally exposed on the south-western part of the studied region, and penetrated by wells in Tovuz-Gazagh field (wells №1, 4, 13, 20-23), GiragKasaman field (№46, 50, 51), Khatinli field (№29, 32), Tarsdallar field (№ 5, 6, 9, 11, 26, 27), Mammadtapa field (№ 1), Sajdaghh field (№4). The Upper Eocene succession was totally penetrated, the Middle and Low Eocene sediments were exposed partially by parametric and exploration wells drilled in Molladagh, Keyruk-Keylan, Gurzundagh, Qarbi Gurzundagh and Boyuk Palantokan structures. Well

data shows that these three stratigraphic units vary by lithology and faunal assemblages within the Kur-Gabyrry interfluve (fig.1, 2). Based on drilling and seismic survey data, lithological and isopachous maps were created (fig.3-5).

In Kur-Gabyrry area, Lower Eocene sediments presented by sandy-shale facies. Analysis of thickness shows various rate of sea floor subsidence in Lower Eocene [8, 9]. Several subsiding and uplifted portions conforming to maximum (600-800 m) and minimum (200-400 m) thicknesses were outlined between 400-500 m isopachytes in south-west part of the basin (fig.3).

Analysis of log and core data obtained in wells penetrated the Lower Eocene sediments allowed mapping of the shales and sands occurring in the south of the Kur-Gabyrry region, and terrigenous-carbonate sediments in the north of the area. In the south the Lower Eocene sediments are predominantly composed of lime shales of the various color. Shale

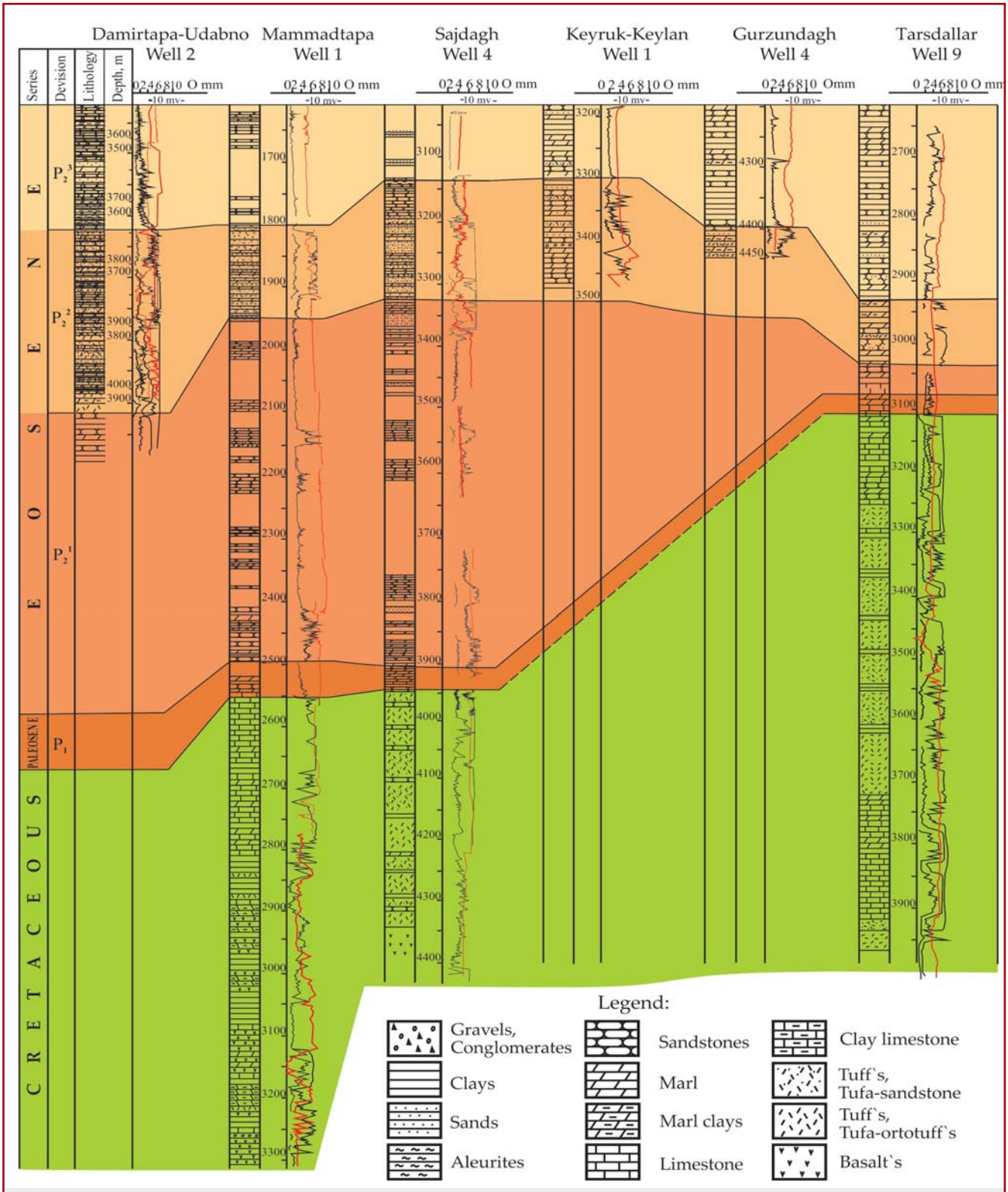


Fig.1. Corellation scheme of the sections of Cretaceous and Eocene sediments in Kura and Qabyrry interfluvial oil-gas region

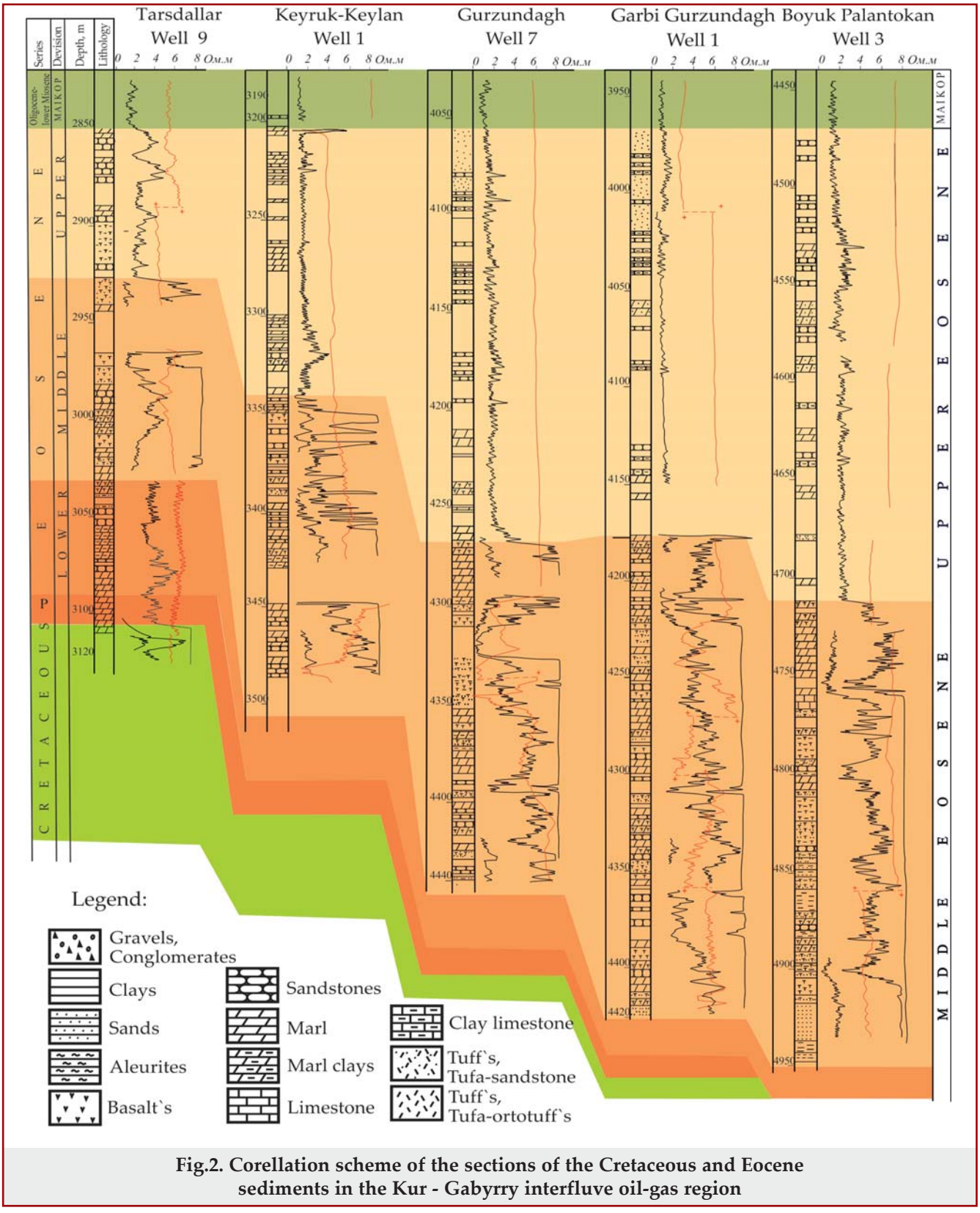


Fig.2. Corellation scheme of the sections of the Cretaceous and Eocene sediments in the Kur - Gabyrry interfluve oil-gas region

thickness is increasing to the south from 40% (GiragKasaman) to 95% (Tovuz-Gazagh). There are interlayers of marls, limestones and sandstones in the various parts of the area. Highest sand content (over 50%) in the Lower Eocene succession is observed in GiragKasaman area [3, 7, 9].

Lower Eocene in GiragKasaman area mostly consists of greenish-grey, grey, lime shales with some interlayers of grey, dense, calcareous sandstone. In wells (№26, 42, 46, etc.) drilled in the central part of the area the lower and upper portions of the Lower Eocene consist of shale while the middle part is composed of sandy horizon constituted by alternating sandstones and shales. Thickness of sandy horizon is 95 m in well № 26 and 130 m in well №47. Total thickness of sandstone in well №26 reaches 65 m, in wells №42 and 46 it is about 60 m. Well № 34 drilled in the eastern part of the

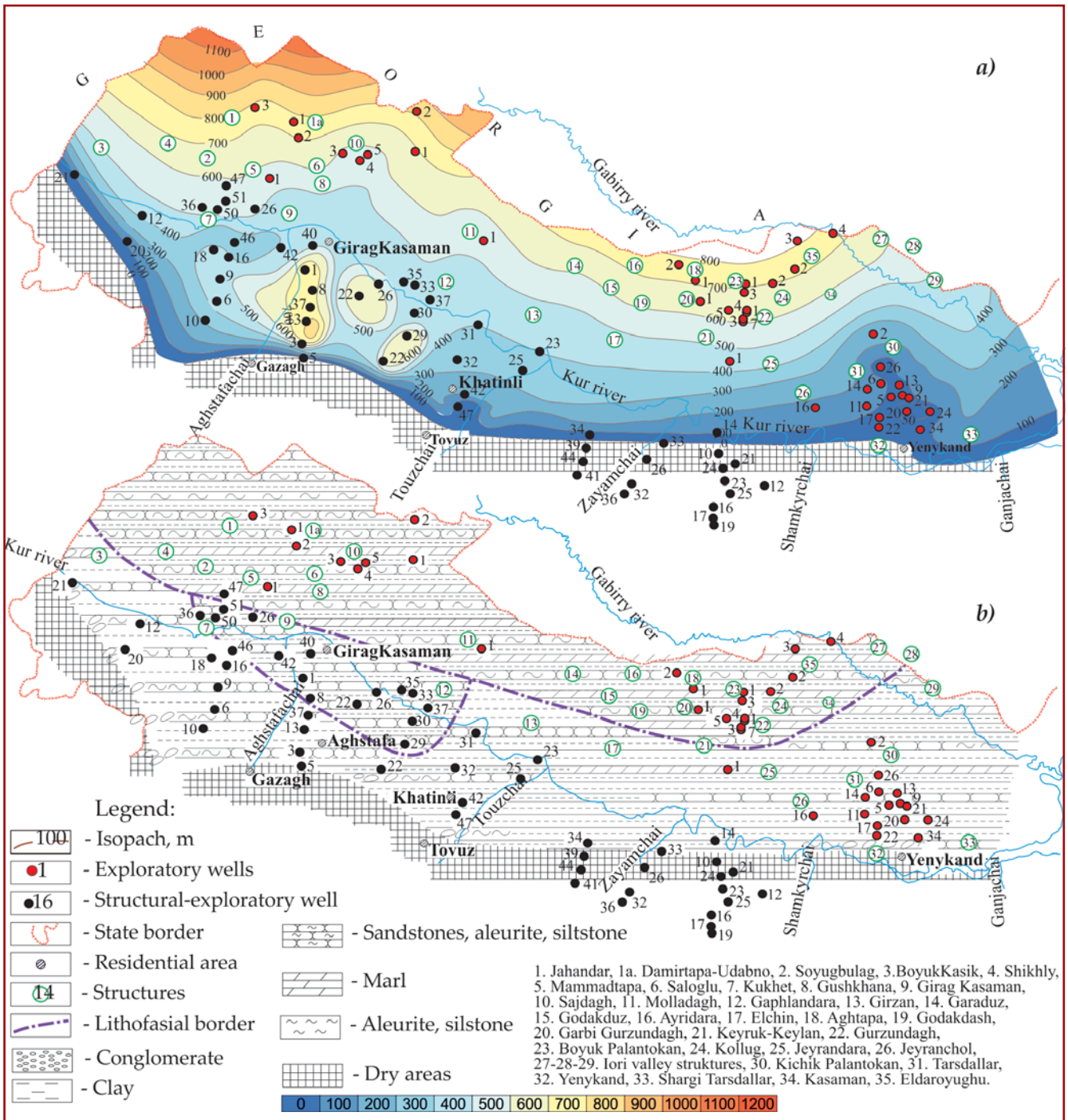


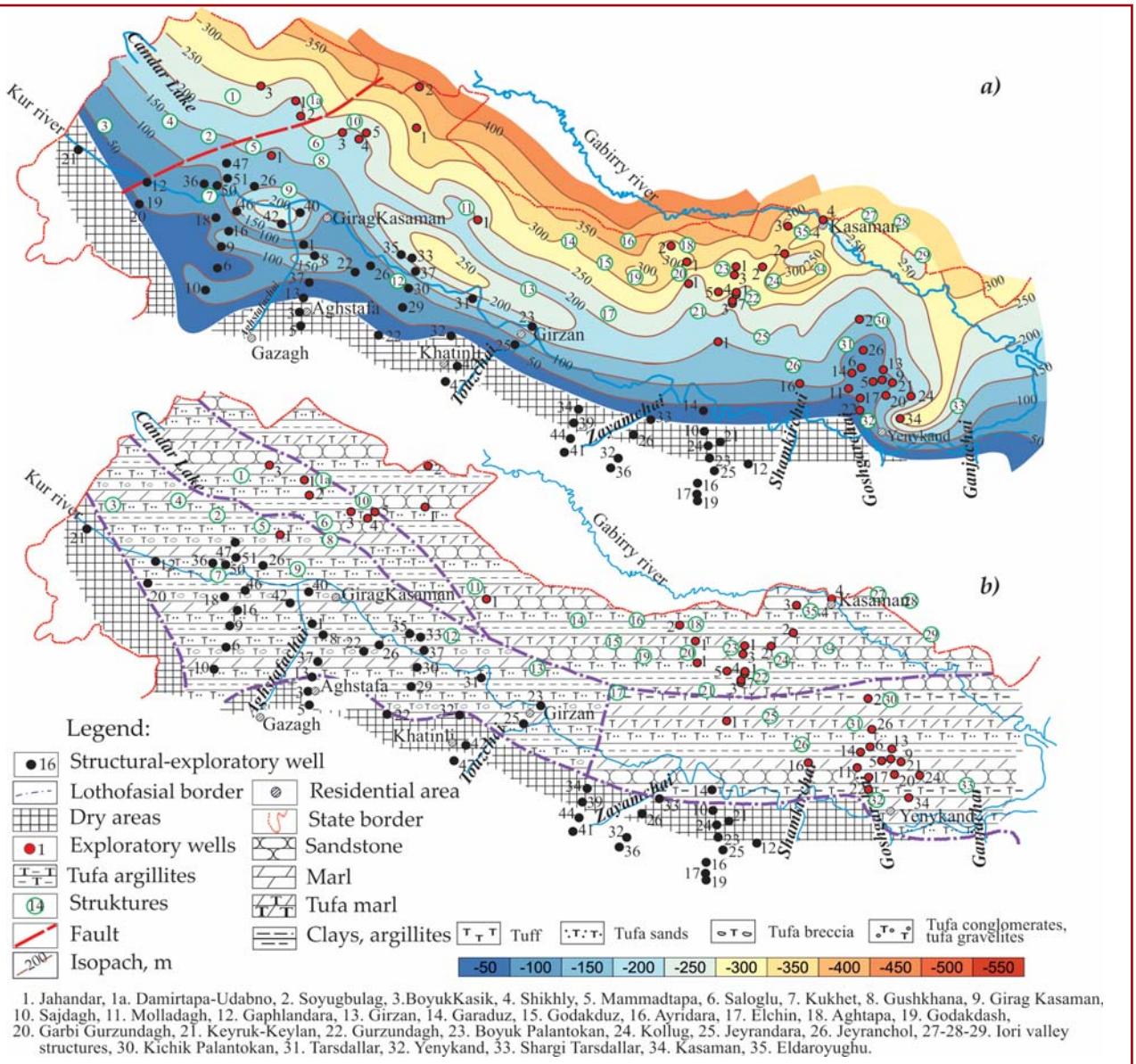
Fig.3. Lithofacies (a) and Isopach (b) map of the lower Eocene sediments

area encountered another sandy horizon of 70 m thickness in the upper part of the section. In the Lower Eocene section both sandy horizons have lens-shape. To the south and east of the area sandy rocks are gradually replaced by shales in section of the Lower Eocene (fig.6).

Lithology of Lower Eocene in Tovuz-Gazagh area is characterized by, mainly, shales, and can be divided into three portions. Lower and middle portions consisting of shale is distinguished by variety of color. Thin interlayers of fine-grained, lens-shaped calcareous sands and sandstones are occurring within the shale. Upper portion of section consists of greenish-grey shaly marl [7, 12]. Thickness ranges between 100 and 850 m.

There is coarse sandstone at the contact between the Eocene and Paleocene in Gaphlandara and Khatinli area. In Khatinli area, the Lower Eocene consists mostly of greenish-grey, in some places of brown-grey shaly marl. The share of shaly rocks reaches 90%. In well № 29 the Lower Eocene sediments with thickness 620 m (830-1450 m interval) consist mainly of shale, in the lower portion there are two sandy horizons (1235-1285 and 1310-1360 m) separated from each other by 20-25 m shale layer. Thickness of both horizons is about 50 m. Sandstones are grey, dense, and fine-grained, in some places medium- and coarse-grained.

The Lower Eocene in Tarsdallar area predominantly consists of carbonate shale with



1. Jahandar, 1a. Damirtapa-Udabno, 2. Soyugbulag, 3.BoyukKasik, 4. Shikhly, 5. Mammadtapa, 6. Saloglu, 7. Kukhet, 8. Gushkhana, 9. Girag Kasaman, 10. Sajdagh, 11. Molladagh, 12. Gaphlandara, 13. Girzan, 14. Garaduz, 15. Godakduz, 16. Ayridara, 17. Elchin, 18. Aghtapa, 19. Godakdash, 20. Garbi Gurzundagh, 21. Keyruk-Keylan, 22. Gurzundagh, 23. Boyuk Palantokan, 24. Kollug, 25. Jeyrandara, 26. Jeyranchol, 27-28-29. Iori valley structures, 30. Kichik Palantokan, 31. Tarsdallar, 32. Yenykand, 33. Shargi Tarsdallar, 34. Kasaman, 35. Eldaroyughu.

Fig.4. Lithofacies (a) and Isopach (b) map of the middle Eocene sediments

interlayers of marl and sandstone in upper portion. Well №24 drilled in southeast of the structure, penetrated predominance of sandstone interlayers in lower part of section. Thickness varies within 50-130 m range (fig.7).

In north part of Kur - Gabyrry interfluve area the Lower Eocene has been reached by drilling only in Mammadtapa (well № 1) and Sajdagh (well №4) areas. In Damirtapa-Udabno and Molladagh fields, the upper portion of the Lower Eocene succession having 80 m and 30 m correspondingly was also opened (fig.6).

In Mammadtapa structure the Lower Eocene is composed of grey, blue-grey, sandy, carbonate shales, marls, and in some places of limestones, grey, fine-grained sandstone and siltstone. 340 m thick sandstone occurring in the lower portion of the section is constituted of three sandy horizons separated by thick shale layers. First sandy horizon with approximately 80 m thickness lying at the base (2412-2492 m) consists of sandstone of 1-1.5 m and in some places of 2-3 m thickness and siltstone layers alternating with shale and carbonate (marl, in some cases limestone) rocks of 3-5 m thickness. Resistivity of rocks reaches 6-8 Ohm, in some cases 10 Ohm. Resistivity curve displays quite good permeability of these rocks. Testing results through this interval show oil and gas manifestations. 170 thousand m^3/day gas production was reported in well №3 drilled in Samgory field, from the Lower Eocene sand horizon occurring in 3678-3750 m interval. Three layers of marls separated by thick shale layers are encountered in the 220 m thick upper portion of the Lower Eocene. Layers of greenish-grey carbonate tuff sandstone and tuff gravelites of 5 m thickness are observed within the marl layer. Total thickness of the Lower Eocene succession is 560 m.

It can be seen that the Lower Eocene sediments were fully penetrated and studied by drilling in two areas (Mammadtapa and Sajdagh) in the north of the region. Lithology, facies compositions and thickness of these sediments in other parts of the zone can be derived only through correlation analysis. Comparison of lithological and facies characteristics

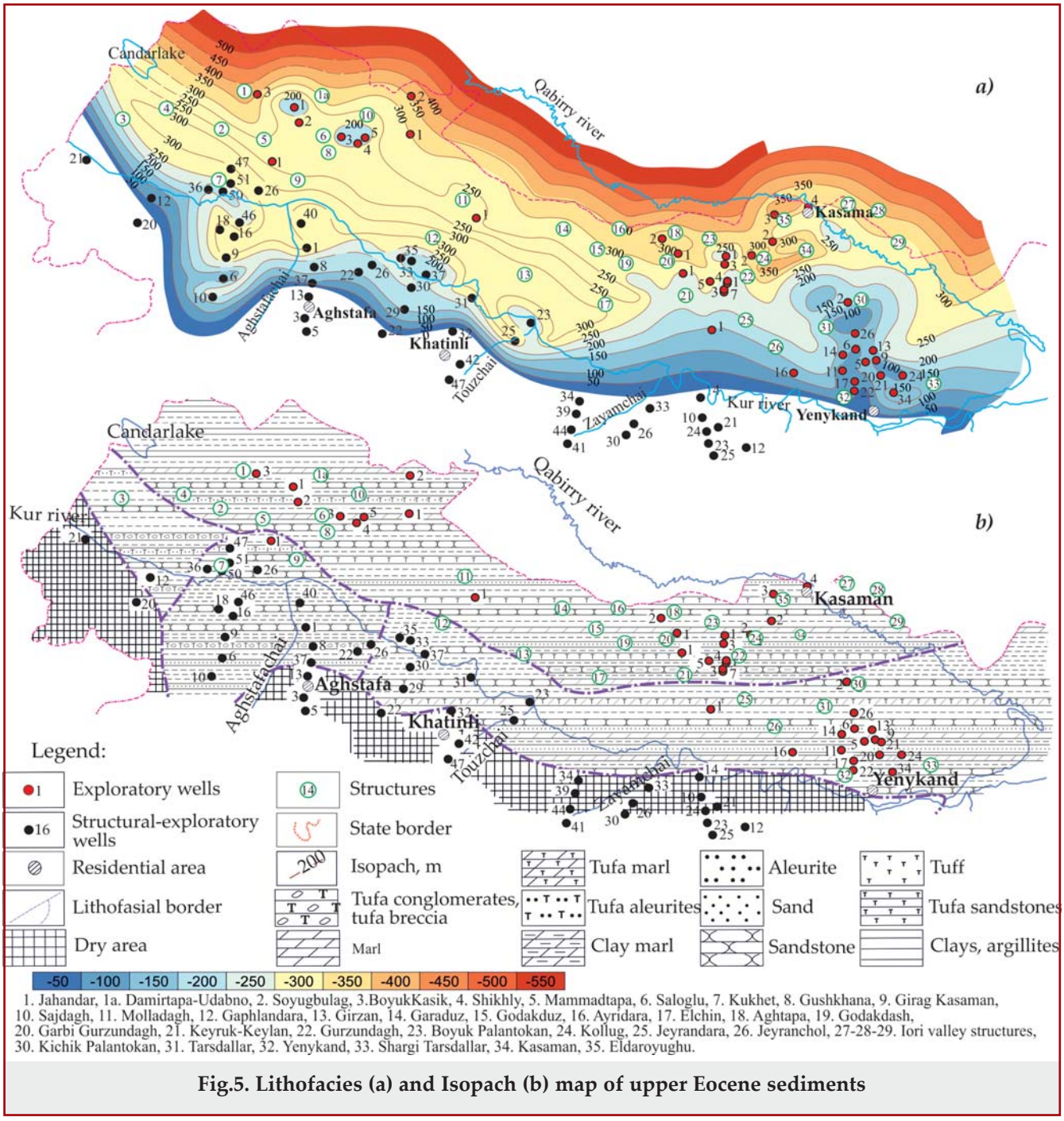


Fig.5. Lithofacies (a) and Isopach (b) map of upper Eocene sediments

of the Lower Eocene succession in south-east of near-Tbilisi region and in the northern portion of the Kur-Gabyrry area, near flanks of the Gabyrry-Ajinohur basin, shows its sections are similar in both zones and consist of terrigenous carbonate sediments [2, 5, 6]. Thickness of sediments in near Tbilisi area is approximately 1200 m. This allows to suppose that on the whole territory of northern part of Kur-Gabyrry area the Lower Eocene sediments are similar to those in neighboring east Georgia, i.e. they are composed of terrigenous-carbonate sediments with thickness increasing up to 800-1100 m (Alachig, Armudlu, Eldaroyughu, etc.).

Despite that, the coastline of the marine basin during the Middle Eocene was similar to that in the Lower Eocene, the thickness and lithology of the Eocene succession sharply differs from the undelaying and overlaying sediments (fig.4).

In south-west part of the Kur-Gabyrry area (Mammadtapa, Khatinli, GiragKasaman, Tovuz-Gazagh) the Middle Eocene is consisting of volcanogenic-clastic sediments (tuff-terrigenous). Tuff breccia, tuff gravelite, tuff conglomerate and tuff sandstone consisting of large clasts of effusive rocks of andesite and basalt predominate in their composition. Their total proportion in the section reaches 80% in the Tovuz-Gazagh and Khatinli areas. The rest of the section consists of shale and marl. Here the thickness of the Middle Eocene sediments varies within 50-210 m ranges. Tuffaceous rocks in the GiragKasaman area compose of 40-45% of the section; the rest consists of shale and sandy rocks approximately in equal proportion. Isopachs show local subsidence and shallow parts of the

basin having the maximum thickness 150-200 m in the central part of the area (between wells №42 and 45) and relatively low thickness (100-150 m) southward. In the northeast part of the area the Middle Eocene section displays the predominantly tuff gravelite, tuff breccia and shale composition, while in the south-west of the area it mainly consists of terrigenous rocks (medium and coarse-grained sandstones, a small amount of gravelitic sands, and thick shale layers). Thickness of the Middle Eocene

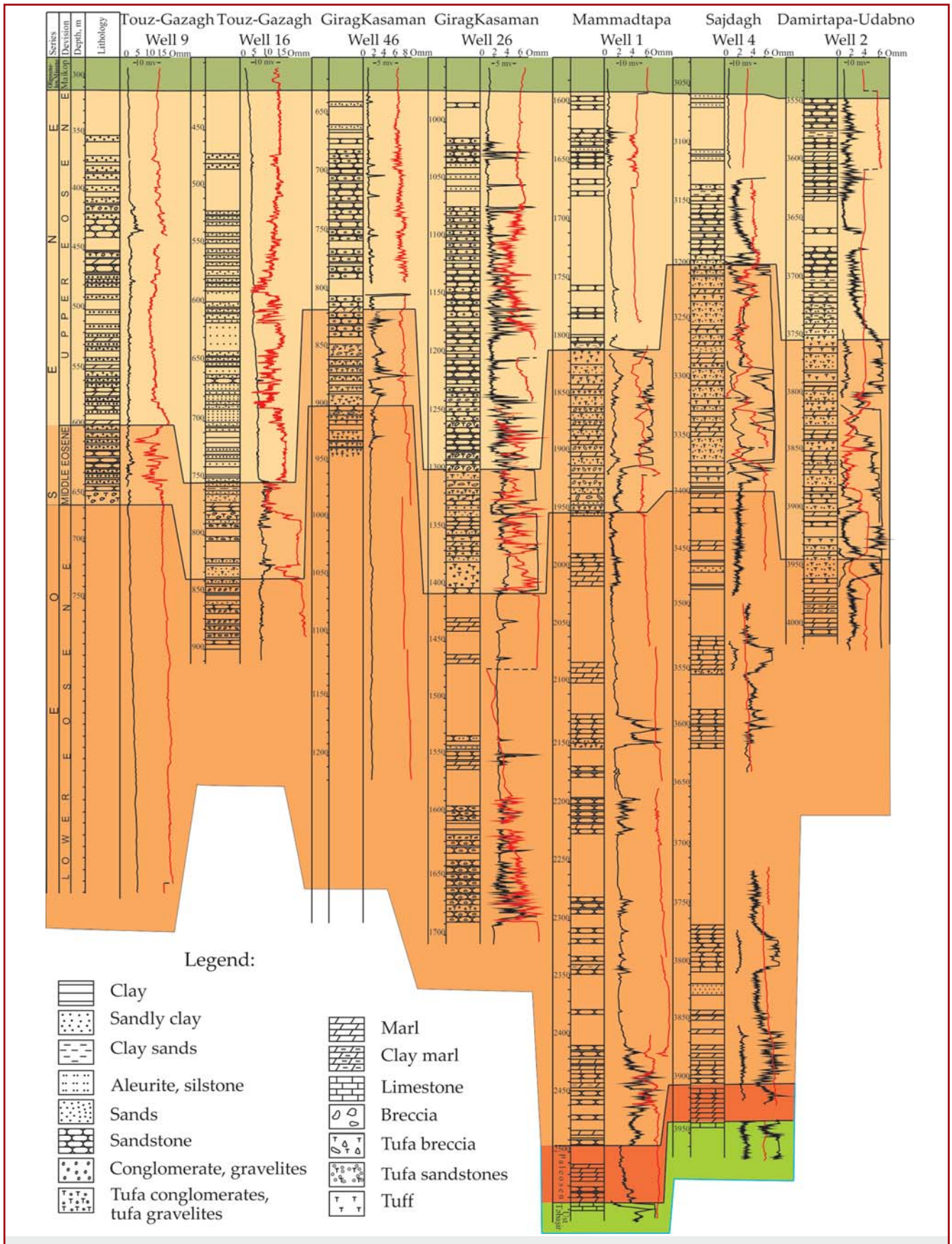


Fig.6. Corellation scheme of Eocene sediments in Tovuz-Gazagh-GiragKasaman-Mammadtapa-Sajdagh-Damirtapa-Udabno fields

sediments decreases from 160-210 m in the south-east (wells №45 and 42) to 50-120 m in south- west (wells № 47, 48) [7, 9].

The Middle Eocene sediments fully penetrated in well № 29 in Khatinli area start with conglomerate beds of 15 m thickness. It is overlaid by alternating shale, sandstone, marl, tuff conglomerate and tuff breccia. Well № 16 penetrated tuff breccia, tuff conglomerate, tuff sandstone alternating with fine-grained sandstone, shale and marl. Thickness of the Middle Eocene varies within 70-90 m range.

Appraisal well № 1 drilled in Keyruk-Keylan area opened 130 m thick Middle Eocene sediments containing mainly terrigenous rocks (shale, marl, sandstone) with tuffs and tuffogeneous beds in some places (fig.2). Resistivity of rocks in some intervals reaches 10-15 Ohm. Resistivity curve reflects poor permeability properties of these rocks. Sandstone of good permeability is observed only in low portion of the section (3480-3485 m).

In Tarsdallar field the Middle Eocene consists of terrigenous-carbonate sediments with dominating shale and marl and in some places - tuffs, tuff pelites, tuff marls, tuff sandstones and argillite layers. Total thickness of sediments in central and northern part of the area is about 40-50 m (wells №5, 6, 26) while in south-east their thickness increases to 140-250 m (wells №24 and 34) indicating to presence of paleodepression here with depocenter during Eocene (fig.7). Small thickness of sediments correspond to crests of paleo-uplifts. Tuffogenous rocks onlapping on uplifts form lithological traps. In Tarsdallar field commercial oil accumulations discovered in the Middle Eocene successions are attributed to such traps [10, 11].

Tuff-terrigenous series of the Middle Eocene has been penetrated at 1815-1953 m interval of appraisal well № 1 drilled in Mammadtapa area, located in the north-west part of the southern zone. Section consists of alternating blue-grey, greenish marls of 2-3 m thickness with tuff sandstone, tuff breccia and tuff gravelite of 5-15 m thickness. Thickness of the Middle Eocene is about 140 m. the Middle Eocene sediments are characterized by high resistivity (up to 80 Ohm) and poorly differentiated resistivity curve.

In north zone of the region the Middle Eocene sediments are expressed by tuff-carbonate series. In south-west of the region (Sajdagh, Damirtapa-Udabno areas) the proportion of tuff-terrigenous sediments, including tuff gravelites, tuff conglomerates, tuff sandstone and tuffs increases while shale amount decreases, they are partially replaced by carbonate rocks. Thickness of the Middle Eocene in Sajdagh area is varying within 180-200 m range, in Damirtapa-Udabno area - in 210-250 m range [5-7].

The Middle Eocene succession across Molladagh area located in north - northeast part of the northern zone having 230 m thickness consists of tuff, tuff sandstone, tuff marls, as well as sandstone, argillite, marls, etc. The lower portion of the section is characterized by high resistivity (50-75 Ohm) and (3780-3670 m) good permeability.

Isopachs show undulation of the Middle Eocene sea bottom in north-east of the region. Wells in areas of Gurzundagh, West Gurzundagh and Boyuk Palantokan display up to 200-280 m thickness of Middle Eocene. Tuff-carbonate sediments are also characteristic for these areas. Sections consist of shale, marl, tuff argillite, tuff marl, tuff sandstone and sandstone layers. Analysis of drilling and geophysical data shows 200-250 m thick the Middle Eocene sediments in Gurzundagh and Garbi Gurzundagh areas, and over 250 m thick succession in Boyuk Palantokan (fig.2).

It can be concluded that lithology of the Middle Eocene succession on flanks of the Kur - Gabyrry basin is being similar to that of southern part of near Tbilisi area, and consists of tuff-terrigenous rocks. Lithology varies towards the northeast and east replacing tuff-terrigenous sediments by terrigenous-carbonates. Thickness of sediments in the western part ranges between 50 to 210 m, to the east decreases down to 40-50 m (Tarsdallar) and increases again in the south-east of the area up to 250 m (well №34). This shows presence of paleosyncline within the Middle Eocene in east – southeast part of the Tarsdallar field.

Total thickness of penetrated tuff-terrigenous lithology in the west of northern zone of Kur - Gabyrry area is within 180-250 m range (Sajdagh, Damirtapa-Udabno). Section dominated by tuff-terrigenous rocks (tuff sandstone, tuffs, sandstone) with decreasing content of shale replaced by carbonate rocks. It is supposed that thickness of sediments will increase to 300-400 m along the north - north-eastern border of the region and will consist of fine-grained tuff-terrigenous rocks (tuffs, tuff marls, tuff sandstone, tuff argillite, siltstone and sandstone) with interlayers of shale and marl similar to near Tbilisi zone. In near Tbilisi area these rocks are oil-bearing reservoirs. Commercial oil was also identified in Tarsdallar and Gurzundagh areas of Kur - Gabyrry from similar reservoirs of Middle Eocene.

Upper Eocene has been studied in more detail by drilling works in Kur - Gabyrry area. Analysis of thickness and facies shows that during their sedimentation as in all parts of Gabyrry-Ajinohur sedimentation basin the intensity of sea bottom subsidence in Kur - Gabyrry area located on south-west slope of the basin was more rapid in comparison to Middle Eocene and slower in comparison to Lower Eocene. This is also evidenced by total thickness (150-380 m) of sediments studied by drilling (fig.5).

Upper part of Upper Eocene consists mainly of shale with some marl and sandstone layers in various portions of area. Sandy-shale lithology increases in lower part of section in south-west (Tovuz-Gazagh, GiragKasaman, Khatinli) and in north-west part (Damirtapa-Udabno, Sajdagh, Molladagh) of the region.

Upper Eocene sediments in the area can be divided into two lithological zones: the south part consisting of shale and the north part made of terrigenous-carbonate zones.

The south zone embraces Kura anticlinal area in the south-west of the region and adjacent Tovuz-Gazagh area. The northern zone embraces Chatma folded belt. In the west of the southern zone the Upper Eocene is mainly made of carbonate shale with thin sand and sandstone interlayers. Highest sandiness is observed in GiragKasaman area located in the delta of paleo Aghstafa river. In the central part of the area sandstone layers of 1-1.5 m and in some places up to 2 m thickness alternating with shale create two sandy-shale layers in Upper Eocene (fig.6). Total thickness of sandstone inter-layers involved in sandy-shale layer outlined by wells №47 and 48 reach 20-25 m. In well № 8 drilled in GiragKasaman area the oil flow was produced from these sandstone inter-layers during formation testing.

In some wells drilled in GiragKasaman area in upper part of Eocene the second sandy-shale layer was identified. The layer consists of light grey, fine-

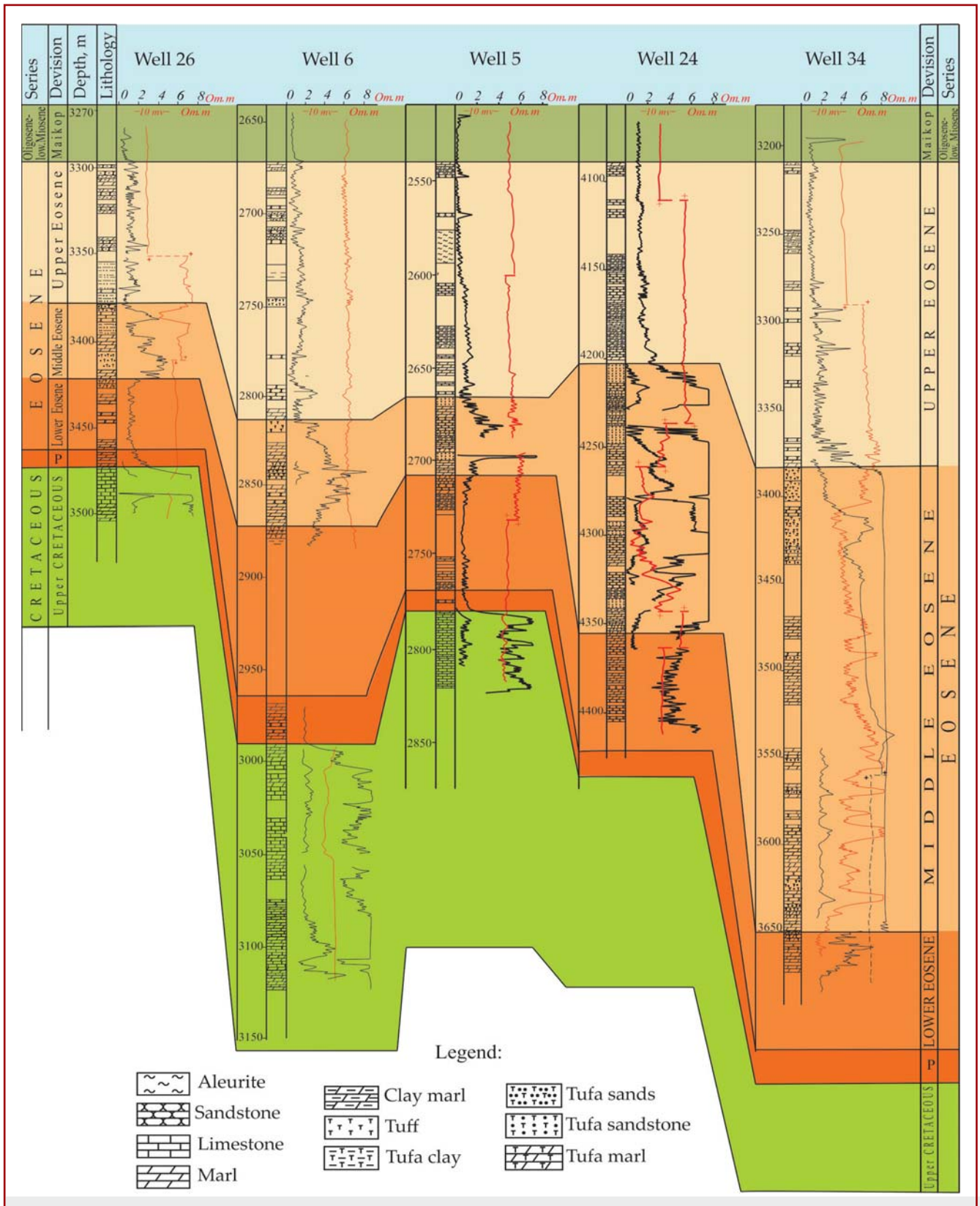


Fig.7. Tarsdallar field. Corellation scheme of the section of Eocene sediments

and coarse-grained shale sandstone of 0.5 – 1 m with alternation of greenish-grey, in some cases grey, dense carbonate shale without inter-layers. Thickness of sandstones varies within 40-80 m range. Thickness in upper portion of section in south-west of the area is 150 m and in the north-east is 205 m. Total thickness of Upper Eocene varies from 200 to 310 m.

In Mammadtapa area Upper Eocene sediments are mainly made of grey shale with fine- and medium-grained, dense carbonate sand and sandstone layers in upper portion of section. Thickness is 220 m. In the central part of GiragKasaman area the thickness of sandy-shale layers decreases along with increased shale content. Similarly, the gradual decrease of sandstone layers thicknesses and quantity is observed to the south-west and to the east from GiragKasaman area. This evidences lens-shaped burial of sandy-shale layers of Upper Eocene.

In Khatinli and Gaphlandara areas located to the south-east from GiragKasaman area the thickness of Upper Eocene sediments is about 220-290 m and further to the south-east in Girzan area its thickness is about 320 m (well №28). The upper part of section in these three areas is made of shale rocks. In lower part of the section, the alternation of thin (1-1.5 m) rare sandstone layers with shale generates sandy-shale layer. Total thickness of sandstone is about 20-25 m (well №28). Shale rocks volume in Upper Eocene section in these three areas is about 80%.

To the east from Girzan area of the southern zone the thickness and sand content of Upper Eocene is gradually decreasing and they are replaced by marls and siltstones. In Keyruk-Keylan area (well №1) top of Upper Eocene consists of carbonate shale with some inter-layers of marl, siltstone and sandstone. The lower part of section has also marl, tuff marl, tuffs and sandstone content. Thickness of Upper Eocene in Keyruk-Keylan area is 150 m (fig.2).

In Tarsdallar field the Upper Eocene sediments were penetrated in a number of wells and sufficiently studied. Lithology consists of carbonate, shale with poor sand content and sandstone, aleurolite and shale marls alternation. In some places tuffogenous rocks are observed. Thickness of sediments varies within 60-100 m range in central part of the area. Maximum thickness (170 m) is in the south-east of the area and this evidences intensive sedimentation as in Middle Eocene. In general, in Tarsdallar area the undulation of sea floor influenced sedimentation process resulted in presence of local areas with minimal and maximal thicknesses (fig.7)

Thickness of the Upper Eocene succession in north of the Kur-Gabyrry interfluve area increases in the north-west direction from 160-180 m (Sajdagh) to 360 m (Damirtapa-Udabno). In both areas, the upper part of section consists of carbonate shale, marl, and argillite and sandstone layers. Volcanogenic rocks (tuffs, tuff sandstones, tuff siltstones, tuff gravelite and argillite) are present in lower part of section. Fine- and small- grained sandstones, aleurolite and argillite layers presence in the section evidences good sorting of fragmentary material to the north (fig.6).

Data acquired in appraisal well №1 drilled in Molladagh area shows Upper Eocene sediments of 230 m thickness consisting of shale, marl, sandstone, aleurolite and tuffs. To the east from Molladagh Upper Eocene facies are changing. Top of Upper Eocene of 210-250 m thickness in Gurzundagh and West Gurzundagh areas is made of sandy shale and the lower portion is made of sandy marl. Sandy shale layer is mostly consists of shale with some inter-layers of sandstone. Shale marl layer consists of marl, tuff marl, in some places of sandstone and shale.

Wells №2 and 3 drilled in Boyuk Palantokan area penetrated the whole section of the Upper Eocene. The section consists of shale, marl and sandstone. Thickness varies from 220 m (well №3) to 260 m (well №2) (fig.2).

According to well data in border areas between near-Tbilisi zone and Kur-Gabyrry area the thickness of the Upper Eocene to the north from Sajdagh and Damirtapa-Udabno areas is about 400-500 m. The share and sorting of sand and carbonate rocks here increases. In near Tbilisi area the thickness of the Upper Eocene is approximately 1000-1200 m. Shales and marls constitute the lower portion of the section while upper portion consists of sands and shales. There are sandstone layers having 8-10 m thickness in the section. Sand amount in Samgory-Patardzeuli zone is about 20-25% of the total thickness of the Upper Eocene. In these regions both sandy and carbonate rocks have commercial oil accumulations.

In this respect, the occurrence of fractured terrigenous-carbonate reservoirs and lithological-stratigraphic traps may be assumed in the Upper Eocene succession, especially in lower portion of the section in the north-west of the region (Yaylacig, Alachig, Armudlu, Eldaroyughu, Agdere, etc.).

Conclusions

Based on patterns of the Eocene sediments lithology and thickness change it can be concluded that the Lower Eocene sand horizons are occurring sporadically, have the lens-shape geometry and form lithological traps favorable for oil and gas accumulations.

Lithological features of the Middle Eocene sediments on the south-western flanks of the Kur- Gabyrry basin are similar to those of southern part of near Tbilisi oil-bearing region and consist of tuff-terrigenous rocks.

Study of the Upper Eocene sediments makes it possible to indicate to the favorable fractured terrigenous-carbonate reservoirs and lithological-stratigraphic traps in lower portion of the section.

Литература

1. Алиев, А. К., Юсифов, Х. М. (1988). О тектонических особенностях и дальнейших перспективах Междуречья Куры и Иори. *Сборник научных трудов АзНИПИнефти, Баку*, 26-36.

2. Кочарли, Ш. С., Гаджиев, Ф. М., Кулиев, Г. А., и др. (1991). Новый тип ловушки нефти в северо-западном Азербайджане. *Серия «Нефтегазовая геология и геофизика» КСП-инфор*, 8, 9-12.

3. Мамедов, А. В. (1973). Геологическое строение Среднекуринской впадины. *Баку: Элм*.

4. Рустамов, Р. И., Рзаев, М. А., Ахундов, Ш. Х. (2000). История геологического развития локальных структур Междуречья Куры и Иори.

5. Süleymanov, Ə. M., Zeynalov, R. L., Məhərrəmov, B. İ. (2006). Kür və Qabırrı çaylararası rayonun Paleogen-Alt Miosen çöküntülərinin neft-qazlılıq perspektivliyinin paleotektonik vəpaleocoğrafi əsasları. *Azərbaycan Neft Təsərrüfatı*, 4, 1-7.

6. Süleymanov, Ə. M., Zeynalov, R. L., Məhərrəmov, B. İ. (2006). Kür dağlararası çökəkliyinin təbaşir çöküntülərinin neft-qazlılıq perspektivliyinin paleocoğrafi və paleotektonik əsasları. *AzNQSDETLİ-nin Elmi Əsərləri*, 6, 36-45.

7. Цимельзон, И. О., Амирасланов, Т. С. (1977). Тектоника палеоген-мезозойского комплекса отложений Междуречья Куры и Иори. *Азербайджанское нефтяное хозяйство*, 1, 4-9.

8. Авербух, Б. М., Мамедов, С. Б., Чиковани, Э. В. (1980). Литофациальные критерии оценки перспектив нефтегазоносности палеогеновых отложений депрессионных зон Западного Азербайджана. *Известия АН Азерб. ССР. Серия наук о Земле*, 3, 66-72.

9. Агабеков, М. Г., Салаев, С. Г., Авербух, Б. М., и др. (1982). Структурно-фациальные особенности и перспективы нефтегазоносности эоценовых отложений депрессионных зон Азербайджана. *Баку: Элм*.

10. Алиев, А. К., Рзаев, А.А. (1987). О тектоническом строении площади Тарсдалляр и перспективах дальнейших поисково-разведочных работ. *Сборник научных трудов АзНИПИнефти. Баку*.

11. Məhərrəmov, B. İ., Ağazadə, B. Q. (2009). Kür və Qabırrı çaylararası rayonu kaynozoy kompleksi çöküntülərinin paleostruktur analizi və və neft-qazlılığı. *AzNQSDETLİ-nin Elmi Əsərləri*, 12, 30-38.

12. Süleymanov, Ə. M., Zeynalov, R. L., Məhərrəmov, B. İ. (2005). Kür dağlararası çökəkliyinin mezozoy kompleksi çöküntülərinin paleostruktur analizi və neft-qazlılığı. *AzNQSDETLİ-nin Elmi Əsərləri*, 5, 14-21.

References

1. Aliyev, A. K., Yusifov, Kh.M. (1988). O tektonicheskikh osobennostyakh i dalneyshikh perspektivakh Mezhdurechia Kury i Iori. *Sbornik nauchnykh trudov AzNIPInefti. Baku*, 26-36.

2. Kocharli, Sh. S., Gadzhiev, F. M., Kuliev, G. A., i dr. (1991). Novyj tip lovushki nefti v severo-zapadnom Azerbajdzhane. *Seriya "Nefteqazovaya geologiya i geofizika" KSP-inform*, 8, 9-12.

3. Mamedov, A. V. (1973). Geologicheskoye stroyeniye Srednekurinskoy vpadiny. *Baku: Elm*.

4. Rustamov, R. I., Rzaev, M. A., Ahundov, Sh. H. (2000). Istoriya geologicheskogo razvitiya lokal'nyh struktur Mezhdurech'ya Kury i Iori.

5. Suleymanov, A. M., Zeynalov, R. L., Magerramov, B. I. (2006). Paleotectonic and paleogeographic prerequisites of oil-gas reserves in Paleogen-Lower Miocene deposits in the area between Kura and Gabyrrhy rivers. *Azerbaijan Oil Industry*, 4, 1-7.

6. Suleymanov, A. M., Zeynalov, R. L., & Maherramov, B. I. (2006). Paleotectonical and paleogeographical bases of oil-gas bearing prospects of Cretaceous deposits of Kurian intermountain trough. *Scientific Works of AzSSRPIOGI*, 6, 36-45.

7. Cimel'zon, I. O., & Amiraslanov, T. S. (1977). Tektonika paleogen-mezozojskogo kompleksa otloženij Meždureč'â Kury i Iori. *Azerbajdžanskoe neftânoe hozâjstvo*, 1, 4-9.

8. Averbukh, B. M., Mamedov, S. B., & Chikovani, E. V. (1980). Litofatsialnyye kriterii otsenki perspektiv neftegazonosnosti paleogenovykh otlozheniy depressionnykh zon Zapadnogo Azerbaydzhana. *Izvestiya AN Azerb.SSR. Seriya nauk o Zemle*, 3, 66-72.

9. Agabekov, M. G., Salayev, S. G., Averbukh, B. M., i dr. (1982). Strukturno-fatsialnyye osobennosti i perspektivy neftegazonosnosti eotsenovykh otlozheniy depressionnykh zon Azerbaydzhana. *Baku: Elm*.

10. Aliyev, A. K. & Rzayev, A. A. (1987). O tektonicheskom stroyenii ploshchadi Tarsdallyar i perspektivakh dalneyshikh poiskovo-razvedochnykh rabot. *Sbornik nauchnykh trudov AzNIPInefti. Baku*.

11. Magerramov, B. I. & Agazadeh, B. G. (2009). Paleostructural analysis and deposits oil and gas content of Cenozoic complex of Kura and Gabarry interstream area. *Scientific Works of AzSSRPIOGI*, 12, 30-38.

12. Suleymanov, A. M., Zeynalov, R. L., & Maherramov, B. I. (2005). Paleostructural analysis and oil-gas bearing of the Mesozoic complex of Kurian intermountain trough. *Scientific Works of AzSSRPIOGI*, 5, 14-21.

Характеристика изменения литофациальных мощностей разрезов не антиклинальных ловушек на Эоценовых отложениях (на примере района междуречья Куры и Габырры Азербайджана)

А.М.Салманов[1], Б.И.Магеррамов[1], Г.А.Аббасов[1], Р.М.Гусейнов[1], Г.Т.Абдуллаева[2]
[1]НИПИ «Нефтегаз», SOCAR, Баку, Азербайджан;
[2]Азербайджанский государственный университет нефти и промышленности, Баку, Азербайджан

Реферат

По проведенным геолого-геофизическим исследованиям были установленны, изменения мощностей по площадям Тауз-Казах, Гырахкесемен, Мамедтере, которые показывают, что песчаные горизонты нижнего эоцена распространены по локальным участкам и имеют линзовидное залегание, которое создает условия для образования литологических ловушек. В некоторых участках туффогенные отложения нижнего эоцена по приподнятым частям горизонтов выклиниваются и на них вероятность образования литологических ловушек более высокая. В западной части северной зоны междуречья Куры и Габырры преимущественно сформировались отсортированные туфогенно-терригенные материалы по которым ожидается распространение выраженных туфогенно-терригеновых отложений, состоящих из глин и мергеля. В разрезе среднего эоцена в похожих коллекторах на участках Терсделлер и Гюрзундаг, в районе междуречья Куры и Габырры, получена промышленная нефть.

Ключевые слова: тектоника, литология, литофация, структура, осадконакопление, залежь, не антиклинальная ловушка, органическое вещество, нефтегазоносность.

Eosen çöküntülərində qeyri-antiklinal tələlərin kəsilişində litofasiya qalınlıqlarının dəyişilmə xüsusiyyətləri (Azərbaycanın Kür və Qabırrı çaylararası rayonu timsalında)

Ə.M.Salmanov[1], B.İ.Məhərrəmov[1], Q.A.Abbasov[1], R.M.Hüseynov[1], G.T.Abdullayeva[2]
[1]SOCAR «Neftqazelmitədqiqatlayihə» institutu, Bakı, Azərbaycan;
[2]Azərbaycan Dövlət Neft və Sənaye Universiteti, Bakı, Azərbaycan

Xülasə

Aparılmış geoloji-geofiziki tədqiqatlara əsasən müəyyən edilmişdir ki, Kür və Qabırrı çaylararası rayonun cənub zonasında alt Eosen çöküntüləri gilli-qumlu, orta Eosen çöküntüləri zonanın cənub, cənub-qərb hissəsində vulkanogen-çökmə (tufogen-terrigen) litofasiyada yayılmışdır, şimal-şərq və şərq istiqamətində litoloji tərkib dəyişərək tufogen-terrigen litofasiya terrigen-karbonat litofasiyaya keçir, üst Eosen çöküntüləri gilli litofasiyada yayılmışdır. Rayonun şimal zonasında isə alt Eosen çöküntüləri terrigen-karbonatlı, orta Eosen çöküntüləri çeşidlənmiş tufogen-terrigen, üst Eosen çöküntüləri terrigen-karbonatlı litofasiyada yayılmışdır. Qalınlıqların təhlili göstərir ki, Tovuz-Qazax, Qıraq Kəsəmən və Məmmədtəpə sahələrində alt Eosenin qumlu horizontları lokal sahələrdə yayılmış və linzavari yatım əmələ gətirmişlər. Bu da litoloji tip tələlərin yaranmasində üst Eosen çöküntülərində, xüsusilə kəsilişin aşağı hissəsində əlverişli çatlı terrigen-karbonat kollektorların və litoloji, stratiqrafik tip tələlərin mövcud olacağını ehtimalı yüksəkdir.

Açar sözlər: tektonika; litologiya; litofasiya; struktur; çöküntütoplanma; yataq; qeyri-antiklinal tələ; üzvi maddə; neftqazlılıq.