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INFLUENCE OF THE DIRECTION OF THE HORIZONTAL WELL BORE ON THE OIL RECOVERY COEFFICIENT

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Abstract. When designing the development of hydrocarbon deposits GS one of the defining conditions is to take into account the features of the geological structure of productive layers, i.e. the geological and physical model of the object. The geological and physical model of a productive reservoir is the basic component that will allow minimizing errors in predicting possible negative effects, measuring them with positive ones, and making a comprehensively informed decision.

Keywords. verticalvertical, horizontal, and horizontal wells oil, oil recovery, field deposits, Plast, drilling operations, development, residual oil,zoom in,pressure, extraction, further development.

I. Introduction.

Practice and theoretical studies show that GEOS can be effectively used for the purposes of additional exploration, gas and oil and gas fields with favorable geological, physical and hydrodynamic conditions, GEOS they can be used in the development of under-gas oil deposits, water-oil zones, and offshore oil and gas fields.; for the extraction of high-viscosity oils and bitumen; for tertiary production of residual oil with increased oil recovery from depleted reservoirs. In addition , GS can be used in the development of deposits that are not available for drilling due to various, in most cases environmental reasons (located under water bodies, mountains, nature reserves, localities, etc .). keep in mind that the construction site is under construction. GS is possible if the following geological, physical , and hydrodynamic conditions are met.

Heat recovery of depleted reservoirs. In addition , GS can be used in the development of deposits that are inaccessible for drilling due to various, mostly environmental reasons (located under water bodies, mountains, nature reserves, settlements, etc .). GS is possible if the following geological, physical , and hydrodynamic conditions are met.

II.METHODOLOGY

DEFINITION OPTIMAL DIRECTI ON STRUCTURES HORIZONTAL OF THE WELLBORES

Geological and physical surveys

At the current stage of development of domestic equipment and drilling technology of hydroelectric power plants they can be drilled in areas where the oil-saturated thickness of reservoirs is not less than 6 m. When lower values the thickness of the barrel HS may go beyond the reservoir limits. However , this limitation can be significantly reduced in the future as new equipment and technology are created. In the foreign press, there is information about reducing the permissible thickness to 5 m.

Hydroelectric power stations can be used to extract oil and gas from almost any type of reservoir, possibly with the exception of loose, highly fractured and collapsing rocks, in which drilling vertical wells is also difficult.

The amplitude of vibrations of the roof and bottom of the formation in the direction of the axis of the wellbore being drilled should not exceed 0.5 layer thickness. Otherwise , the trunk GS goes beyond the limits of the productive reservoir, which negatively affects its flow rate and leads to a number of undesirable consequences. It should be noted that this General provision should be taken into account only at the stage of additional development of the field, when gas wells are drilled as compaction wells. At the stages of additional exploration and operational drilling , such a provision can practically not be fulfilled, since the location of small and medium-sized wells is almost impossible. the size of structural elements – such as depressions, protrusions, vents, micrograbens, etc., is usually unknown. They are detected during drilling.

It seems to us that the identification of various structural elements during additional exploration and operational drilling of deposits with the help of GS this is a necessary condition. This will allow us to get a fairly complete picture of the geological structure of the Deposit, the contours of the deposits, and offer a more reasonable system for developing reserves. In this case, HS play the role of exploration and appraisal wells, which can provide more complete and reliable information than vertical wells.

The angles of inclination of oil -bearing formations, up to their vertical position, are not an obstacle to their use. GS for the purposes of additional exploration and development of deposits. Depending on the features of the occurrence of oil -bearing formations and lenses GS can be drilled both along the strike and in the cross -strike of formations.

In deposits of massive or massively layered type, underlain by plantar water, in water-oil zones of reservoir deposits with a gas cap, HS is carried out at the maximum possible distance from the WNC and SNC. This takes into account the possibility of spontaneous deviation of the HS trunk into the water-bearing or gas-bearing regions.

Development efficiency HS increases for reservoirs with high inhomogeneity of distribution capacitance-filtration properties and at low values. Especially effective GS in the development of fields where oil is contained in cracks and karst cavities that form narrow extended zones among the main field of compact rocks -the matrix. Vertical wells are very difficult to get into these areas. And HS drilled in different directions of such zones successfully open them are highly productive. Drilling of low-permeable oil and gas reservoirs HS it showed that their productivity is several times higher. it is several times higher than that of vertical wells. This is explained by the fact that in GS the surface of the opening of a productive reservoir is one or two orders of magnitude higher than that of the vertical ones.

It can be effective to use GS for developing oil reserves from dead -end zones formed at tectonic screens of tectonically shielded deposits, such as grabens and gorsts.

The developed layers of the small tolschina should not contain lenses whose rock hardness is an order of magnitude or more higher than the hardness of the main oil-saturated rocks. The presence of such inclusions may cause the wellbore to go beyond the oil -bearing reservoir.

Experience shows that hydroelectric pumps can be used for the extraction of both heavy, high-viscosity and light , low-viscosity oils.

Hydrodynamic conditions

The rock pressure in the plastic formations composing the field section in the drilling interval should not exceed the critical value determined by special calculations, experimental studies and analysis of drilling results in this area. At high pressures , ductile rocks bulge, which leads to a violation of the integrity of the casing string or the disappearance of the trunk in non-planted wells. Similar phenomena are observed in layers of salts, sulfur, clays, etc.

There should be no abnormally high pressures in oil-saturated formations. At high reservoir temperatures, due to the heterogeneity of the formation, there is a danger of liquid ejection from the trunk of a long length.

High content gas in oil is an undesirable factor in the development of GS oil fields. in GS, associated gas to some extent interferes with the filtration of liquid in the well. The permissible limit of the gas factor is determined by calculations and hydrodynamic studies.

Oil and gas bearing rocks should have sufficient vertical permeability. Calculations show that when applying

In currently , for the development of low-productive reservoirs , the only effective method is actually a variety of development systems with hydroelectric power stations, which can ensure profitable production of hydrocarbons due to high development rates. Therefore, when determining the placement and design GS in the process of designing the development of specific facilities , at least an expert assessment of the performance of these wells is required. The paper attempts to determine the statistical relationship of production rates GS and geological characteristics of objects, as well as technological factors. The presence of a connection between the initial gas flow rate and parameters such as the length of the horizontal shaft in the formation, the thickness of the highto distance from the bottom point of the horizontal shaft to the oil -water contact. In addition to these parameters, the current flow rate of HS depends on the fraction of the opened interval, the number of intersections of productive interlayers by the horizontal trunk.

One of the factors that significantly influence the rationale for the optimal design of a horizontal wellbore is the duration of flow rate stabilization after the well is put into operation. She depends on permeability the formation, existence and degree hydrodynamic connection between propustili, thickness and sequence the occurrence of these crosspieces, number opened crosspieces horizontal trunk stay horizontal trunk created depression on the layer, etc. In this paper , based on mathematical experiments performed on a reservoir element, it is shown that when justifying the optimal the length of the horizontal shaft must be provided for reducing the flow rate during production. This is due to the peculiarity of the oil flow to the horizontal wellbore, due to changes in the geometric shape and size of the area drained by the well. Flow rate reduction rate there will be a weight of MMA it is significant at low anisotropy parameters, small reservoir thickness, low reservoir permeability, and high oil viscosity. Therefore, when justifying the optimal length of the horizontal shaft, calculations should be based only on a stabilized large diameter.and oil production rate reduction.

III. CONCLUSION

Let's focus on the time factor – the operating time of the well. A significant change in the flow rate over time is related to the size of the drainage zone drainage of the flow rate over time is related to the size of the drainage zone. Mathematical experiments have shown that when the drainage zone of a horizontal wellbore is reached within the reservoir thickness , the filtration resistance increases due to an increase in the radius of the feed loop . Value it is closely related to the duration of well operation. Taking a certain value not knowing it istinnogo values, and based on from geometry location horizontal trunk and measured values of the flow rate and depression, can be very it is possible to make mistakes when determining reservoir parameters based on hydrodynamic studies. This fact is reflected in detail in the works.

Thus, when determining the optimal design of a horizontal barrel, the following positions should be taken into account : :

with an increase in the length of the horizontal shaft , the intensity of flow rate growth decreases, and with a length of 600-800 m (depending on the wellbore design and geological and physical parameters of the formation), a negative rate of flow rate growth is observed and pressure losses in the horizontal wellbore increase in proportion to the growth of the wellbore length;

with magnification the oil production rate initially increases, and then the rate of its decline increases; accordingly , the pressure loss in the horizontal barrel first increases, and then decreases;

as the anisotropy parameter increases , the oil flow rate increases and, as a result, the pressure loss in the horizontal shaft increases;

with increasing depression on the reservoir , the oil flow rate increases, and losses in the horizontal shaft increase by 1.5 times in comparison with the growth of the flow rate.

Below are the analytical dependences obtained by us and calculations for determining the optimal length of a horizontal wellbore. It should be noted that they are preliminary and do not covery the entire range of parameters that affect the optimal design is determined.

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