



Extraction of hydrocarbons

Hydrocarbon production at Zhengeldy field

Zhengeldy field



TOO “M-Ali Petrol” Leader of the year 2018





Zhengeldy deposit.

Field location





Zhengeldy deposit.

General information about the deposit.

Location:

By administrative division, the Zhengeldy square is confined to the Makat district of the Atyrau region. The regional center of Atyrau is located 100 km to the southwest.

Nearest settlements:

- Dossor village at a distance of 15 km.
- Makat village at a distance of 25 km.

Прилегающие месторождения:

- Dossor deposit on distance 15 km.
- Makat field on distance of 25 km.





Zhengeldy field

Zhengeldy field location

Geological allotment and cartogram

Mountain allotment.

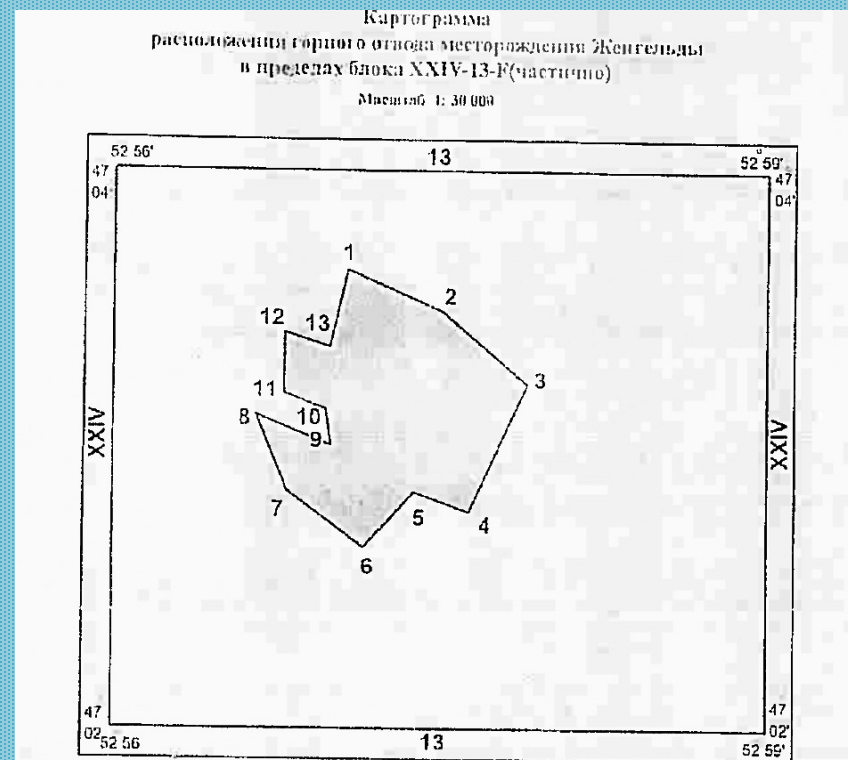
The allotment area - 1.5 km².

The coordinates of the corner points of the mining allotment.

Угловые точки	Координаты угловых точек					
	Северная широта			Восточная долгота		
	гр.	мин.	сек.	гр.	мин.	сек.
1	47	43	04	52	57	05
2	47	42	56	52	57	32
3	47	42	42	52	57	57
4	47	42	17	52	57	40
5	47	42	21	52	57	24
6	47	42	10	52	57	10
7	47	42	21	52	56	48
8	47	42	36	52	56	39
9	47	42	30	52	57	00
10	47	42	37	52	56	59
11	47	42	40	52	56	47
12	47	42	52	52	56	47
13	47	42	49	52	57	00

Картограмма горного отвода.

The depth of development is up to the absolute mark of minus 700 meters.





Zhengeldy field

Information about Subsoil Users:

- In March 2017, Addendum No. 4 to Contract No. 385 dated December 14, 1999 was signed for the production of hydrocarbons at the Zhengeldy field with the transfer of the Subsoil Use Right to **M-Ali Petrol LLP**.
- Percentage on export - 65% in accordance with the terms of clause 5 of Addendum No. 4 to Contract No. 385 dated December 14, 1999.



Zhengeldy field

Oil reserves.

In 1992, TsNIL PO Embanefit calculated oil reserves based on the available information on the geological structure of the field.

Oil reserves of the Zhengeldy field are :

- C1 category geological / recoverable -1417.0 / 425.0 thousand tons.
- in category C2 geological / recoverable - 512.0 / 153.0 thousand tons.

According to the expert opinion (No. 13-НГ-329 dated October 13, 1999), the State Reserves Committee under the KGiON of the Republic of Kazakhstan confirmed the reliability of oil reserves approved by the State Reserves Committee of the USSR in category C1 (protocol No. 3915 dated June 15, 1946).

17 wells were drilled.



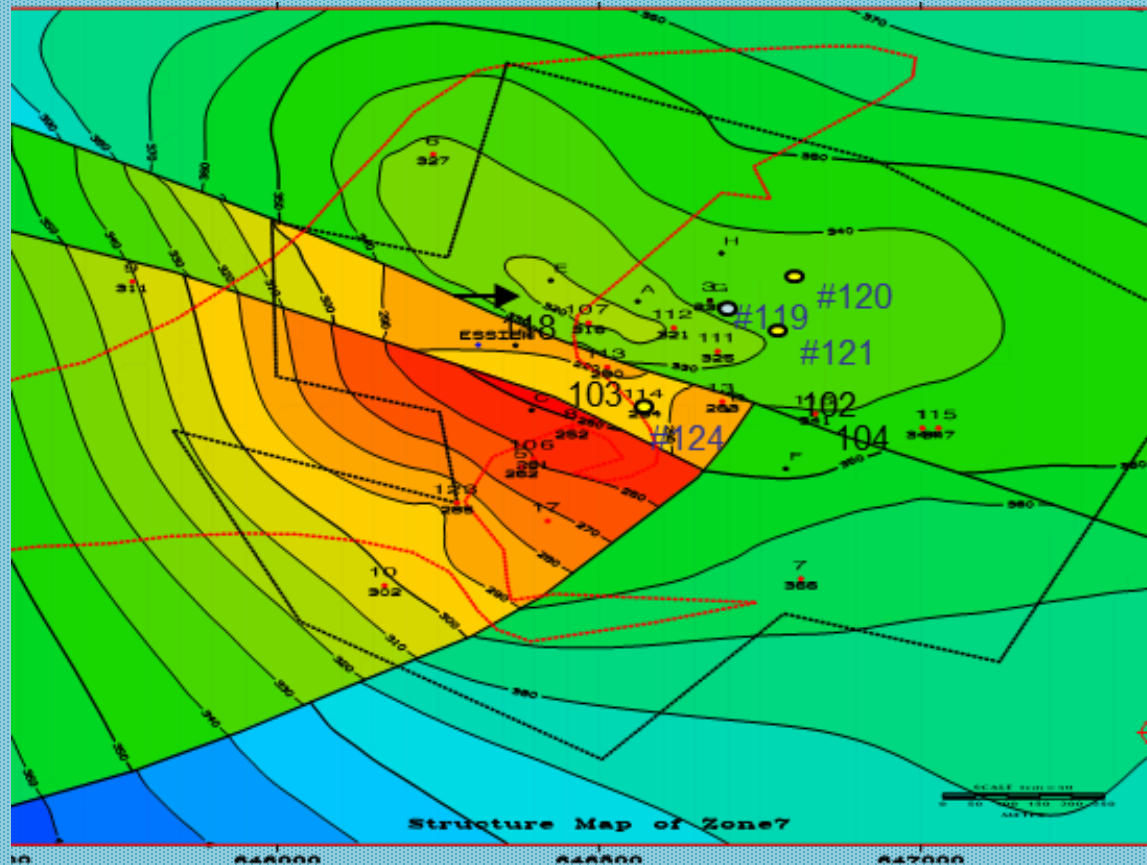
Zhengeldy field

Physical and chemical properties of oil

No п/п	Indicators	Unit.	Results
1	Density Плотность при 20 ⁰ C	кг/м3	0,882
2	Viscosity Вязкость, при 20 ⁰ C	мм2/сек	82,6
3	Sulphur Содержание серы	%, масс	0,19
4	Oil pour point	⁰ C	-27
5	Paraffin content	%, масс	0,16
6	Chloride content	мг/л	672,99
7	Content of mechanical impurities	%, масс	0,02



Geology



- The commercial oil-bearing capacity in the Zhengeldy area is established within the central and eastern fields of the southwestern wing of the salt dome. In the central field, as a result of sampling, 7 oil horizons were identified: 4 horizons in Cretaceous deposits (Upper Aptian, Lower Aptian, Upper Neocomian and Lower Neocomian) and 3 horizons in Middle Jurassic deposits (Yu-II, Yu-III, Yu-IV).
- The depth of occurrence of productive horizons ranges from 129 m to 410 m. Reservoirs are porous, lithologically represented by sandstones. By the nature of occurrence, the deposits are stratal, tectonically screened.



Zhengeldy field

Current state of field development

The production well stock is 27 wells, of which:
the operating fund has 6 wells;

- in the injection well stock - 1 well, used for utilization of produced formation water;
- suspended - 20 wells.

At this time, pilot development and trial oil production from 6 (six) wells is underway, by mechanized operation:

- by running a screw pump - 4 wells
- rocking machine (SHGN) - 2 wells

Daily oil production averages 10-12 tons per day. About 300 tons of oil are produced monthly. In the future, by the end of this year, we plan to carry out work on reopening the remaining 20 (twenty) wells, increase daily oil production to 60-70 tons per day and monthly produce up to 1800-2000 tons of oil.



Zhengeldy field

Field development.





Zhengeldy field

Field development.





Zheengeldy deposit

Growth potential of oil reserves.

Tectonically, the Zhengeldy field is confined to the salt structure of the same name, which is a salt dome. The dome is divided by narrow grabens into three wings: North, North-East and South-West. In turn, the South-West wing is divided into three fields: West, Central and East. Commercial oil-bearing capacity is established within the Central and Eastern fields of the Southwest wing of the structure, where the company is currently conducting pilot development. The western field is poorly studied. Exploration wells # 9 and # 19 were drilled in this area. According to geophysical surveys, the Yu-II horizon is oil saturated at wells 9 and 19 and tested at well 9, the Yu-IV horizon, which was also tested in well 9, is also oil saturated.



Zheengeldy deposit

Growth potential of oil reserves.

At present, the company's specialists are collecting and analyzing old geological and geophysical materials for the field, as well as for neighboring companies of subsoil users. After analyzing the collected geological materials, initial data and a letter of appeal to the Competent Authority will be prepared with a proposal to expand the boundaries of the mining allotment outward in the West direction in order to increase the development depth to an absolute mark up to minus 1,500 meters. We are also negotiating with leading companies to carry out 3D seismic operations. Based on the seismic results, it is planned to drill new wells to increase the growth of oil and gas reserves at the field. According to preliminary estimates, in-place reserves of C1 oil may increase to 2.5 million tons.



Zheengeldy deposit

Oil reserves growth potential.

Analysis of old geological and geophysical materials makes it possible to study the tectonics of the surface of the salt dome (OG-VI) and reveal the presence of salt cornices under the steep slopes of the dome. Clarification of the surface morphology of salt domes may lead to an increase in the number of potential hydrocarbon traps and the likelihood of discovering new hydrocarbon deposits on the slopes of the salt dome in Permian Triassic deposits, which allows predicting an increase in oil reserves.

According to the data from the report of the results of the interpretation of seismic materials by **Ecopetrol LLP** at a depth of 4000-5000 m deeper than the known deposits under the salt dome of the Zhengeldy structure, a second oil and gas layer is assumed, including the Permian-Triassic and Carboniferous deposits, and the predicted geological oil reserves at the Zhengeldy structure according to their calculations is 131 Mbr or about 18 million tons, including post-salt and sub-salt deposits.

In this regard, it is recommended to conduct a 3D seismic survey in order to study the subsalt deposits of the Carboniferous and Devonian, and to increase the geological reserves of oil in the subsalt structures to 10 million tons.

The seismic section with the highlighted perspective traps is shown in the next slide.



Zheengeldy deposit

Interpretation of a seismic section by specialists of Ecopetrol LLP.

