

<https://doi.org/10.29013/AJT-22-7.8-8-11>

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## **PROTECTION OF THE SUBSOIL AND THE ENVIRONMENT DURING THE DEVELOPMENT OF GAZ FIELDS BY DUAL COMPLETION**

**Abstract.** The development of an oil field as a whole and each of its individual objects should be carried out in accordance with approved project documents. Proposals made during the operation of a field (deposits) that are not foreseen by the project (technological scheme) to improve the development system, leading to changes in the accepted design provisions on the number of producing and injection wells, oil production levels and water injection, can be initiated by implementation only after the project document is re-approved.

Industrial development of oil and oil and gas fields is allowed only if the gas extracted together with oil is used in the national economy or, for temporary storage purposes, is pumped into special underground storage facilities, into oil reservoirs being developed or to be developed.

In the process of industrial development of oil fields, the collection and use of gas, condensate and related valuable components and water extracted together with oil must be ensured in the volumes provided for in the approved technological project document. A project for the development of an oil field for industrial development can be accepted for approval only if it solves the issues of collecting and rational use of petroleum gas.

**Keywords:** exploration, development, oil production, pollution, catastrophe, flora, fauna, soil erosion.

The issues of ecology and nature protection include restrictions on the external impact on the environment, preventing the loss of hydrocarbon resources during the extraction, carrying out technical and control measures.

Oil and gas enterprises occupy one of the first places among other sectors of the national economy in terms of the degree of environmental impact. Exploration and development of oil fields includes such technologies as exploration drilling, oil production, collection and preparation of hydrocarbons, transportation and processing.

The enterprises of the oil and gas industry have a harmful effect on all objects of nature, the atmosphere, the hydrosphere and underground and sur-

face waters, the geological environment, drilled wells at all depths, on the land where they are located.

The cycle of oil and gas works consists of two main groups:

1. New construction sites (search and exploration, drilling, installation of equipment).
2. Working processes of the enterprise (collection, processing, shipment and processing of oil and gas).

When carrying out construction work, a report is made on technogenic pollution of the earth and the environment for technical reasons.

A report on the measures taken to protect the environment should be prepared by oil and gas producing organizations [1].

It should be noted that the time spent on exploration, drilling and preparation of oil and gas fields, the production time of the enterprise, pollution is caused for technical reasons.

The performance of these works causes high harm to the environment. Ecological catastrophes that occur are physical and mechanical impacts on soil, land, flora, fauna, soil, lowering of hydrogeological conditions, strengthening of soil erosion conditions, deterioration of living conditions of fauna and flora and local residents, and others.

Currently, geological studies have been completed at the Altyguyi gas condensate field and a field test plan has been prepared based on the data obtained.

When drilling wells in the fields, the environment is polluted mainly by some chemical elements used in the preparation of drilling fluids.

Currently, normal limit values, chemical elements indicating aggressiveness used in the preparation of drilling fluids have not been established.

During drilling operations, the source of atmospheric air pollution is diesel-fueled equipment that emits 2 tons of hydrocarbons and soot, 30 tons of nitrogen oxides, 8 tons of carbon monoxide and 5 tons of sulfur anhydrite into the atmosphere during the year. When drilling wells, drilling mud is mixed with soil layers, surface and groundwater, forming 30 m<sup>3</sup>/day of water used [2].

During the development of wells, hydrocarbon mainly causes pollution. In most cases, oil-based circulating solutions with serious environmental consequences produce used wastewater, suspension and colloidal solution.

When preparing environmental protection measures during installation work in wells, it is necessary to avoid work that negatively affects natural objects. Since the sources of pollution are closely related to the technology used by the enterprise, it is necessary to establish the technology that has the least impact on the environment. When geochemical breakdown of the soil, it is necessary to perform the following:

- When preparing plots, it is necessary to prevent contamination of the topsoil from the products obtained;
- To collect sedimentary rocks of drilled rocks on slurry barns;
- It is necessary to cover the slurry barn;
- Restore the soil area of the extracted products;
- Road construction.

As a result of drilling operations, there is a negative impact on the hydrogeological change in the soils of the earth, and as a result, drilling fluids penetrate into aquifers, which lead to the formation of a complex of waters.

The waters used in drilling fluids are divided into three groups:

1. Water formed during the production of works;
2. Water for household work;
3. Atmospheric, rainwater.

Circulating waters are used to carry drilled rocks to the surface. In world practice, 95% of clay elements are mixed into the composition of circulating waters for the preparation of drilling fluids.

The quality of the flushing solutions used helps the speed of drilling operations, the prevention of complications with colmatation and water occurrence [3].

During the operation of producing wells and oil and gas collection facilities, the integrated safety and environmental protection system includes:

- monitoring of the condition of borehole fittings;
- selection of equipment and pipelines that meet the specified operating conditions, taking into account current regulations;
- periodic testing of equipment for strength (crimping);
- corrosion protection;
- prevention of technological complications that create emergency situations (gas communications flooding, deposition of paraffin and salts in wells and collection systems), with the use of special inhibitor substances.

When collecting and storing oil, the requirement of safety and reduction of hydrocarbon emissions into the environment are ensured at the stage of arming assembly points in compliance with building codes and regulations, with the necessary equipment of tanks with floating roofs or breathing valves, with mandatory collapse of tank farms to localize emergency oil spills [4].

When implementing the gas lift method of oil production, with a high manifestation of gas injected into the well to ensure safety and environmental protection, it is envisaged (in addition to the design and construction of the main facilities in full compliance with the required technological parameters of operation according to the current building codes and regulations) the construction and proper operation of additional technological equipment that provides a hydrate-free operation of gas distribution systems (furnaces for heating gas and inhibition unit). In the case of the construction of furnaces for heating hydrocarbons, make a preliminary calculation of atmospheric pollution by combustion products and assess the need to determine the MPC.

Storage and use of chemicals is planned to be carried out in accordance with their individual characteristics and in accordance with Safety Regulations (SR) in the oil industry, including providing employees with personal protective equipment (PPE), carrying out instructions and monitoring the condition of equipment used for the use of chemicals (surfactants, methanol, etc.).

The operation of electrical installations and heating equipment is provided in accordance with the current rules of SR and fire safety rules.

According to estimates, in oil fields with a similar technology of oil extraction and collec-

tion, the maximum concentrations of the above harmful substances at the border of the sanitary zone (within a radius of 1000 m from the source of emission) do not exceed the maximum permissible (MPC), which are set for each harmful substance individually according to the methodology of the State Committee for Hydrometeorology (OND-86).

In this regard, emissions of harmful substances into the atmosphere, subject to regular (accident-free) technological modes of operation of oil and gas field equipment, can be considered approximately corresponding to the maximum permissible emissions (MPI) [5].

A detailed assessment of emissions for all fishing facilities is taken into account when compiling an environmental passport.

The environmental passport is being developed in accordance with GOST 17.0.0.04–90 “System of standards in the field of nature protection and improvement of the use of natural resources”, which already gives the full technological cycle of this production from the supply of raw products to the finished product. At the same time, the presence of emissions, discharges and solid waste is carefully checked and calculated at each production facility and their impact on the environment is analyzed. All this material is described and calculated in the relevant chapters of the environmental passport. It also concludes that it is necessary to calculate the norms of MPD, the results of which are issued in the form of a second volume, but in the future, in the event of an increase in oil production due to Miocene-Paleogene and Mesozoic underlying red-colored sediments, it will be necessary to adjust all calculations on emissions.

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