Limitierung des Zerfließens wurde mit der Hilfe des Wassersgehaltes geregelt. Der Normalwert des Zerfließens wurde innerhalb der Grenzen 110-115 mm gehalten.

Die Eigenschaften des Betons wie die Wasserabsorption, die Dichte und Porosität wurde nach der diskreten Methode ermittelt. Die Wasserdichte wurde nach dem Zeitrafferverfahren laut der Empfehlungen des Staatsstandartes festgelegt. Die Ergebnisse der Untersuchungen sind in der Tabelle dargestellt.

Literatur:

1. Батраков В.Г.Модифицированные бетоны. Теория и практика. М., 1998. – 768 с.
2. В.П. Сизов. Проектирование составов тяжелого бетона. – М.: Стройиздат, 1979.
3. Шейкин А.Е., Чеховский Ю.В., Бруссер М.И. Структура и свойства цементных бетонов. – М.: Стройиздат, 1979.
4. Прощин О.Ю., Яковлева Р.А., Костюк Т.А., Демина О.И., Салия М.Г. Использование пигментов для составов проникающей изоляции. / Науковий вісник будівництва.- Харків: ХДТУБА, ХОТВ АБУ, 2009. - Вип. 53. - с. 136-139.

RESEARCH OF THE STATE OF THE WATER ENVIRONMENT IN THE REGIONS OF THE LOCATION OF OIL AND GAS DEPOSITS

MYKOLA LIESNIAK, PhD student
IGOR V. UDALOV, Professor, Doctor of Science in Geological sciences, Scientific Adviser
IULIIA I. SHAMAIEVA, Associate Professor, PhD in Philology, Language Adviser
V. N. Karazin Kharkiv National University, Kharkiv

The national environmental policy of Ukraine envisages the stabilization and improvement of the state of the natural environment through the implementation of an ecologically balanced system of nature management and preservation of natural ecosystems. The proper state of the environment is ensured at the legislative level, for example, by the laws of Ukraine "On Environmental Protection", "On Environmental Expertise", "On Environmental Impact Assessment".

Enterprises carry out measures for the implementation and certification of international standards in the environmental field. The family of ISO 14000 standards provides for the possibility of minimizing the negative impact of enterprise activities, compliance with laws, regulations and other environmentally-oriented requirements.

In addition, the oil and gas industry also has sectoral regulatory documents aimed at minimizing the impact on the environment at all stages of industrial activity. Thus, the development of oil and gas deposits is carried out in accordance with the "Rules for the development of oil and gas deposits" [1].

Therefore, studies of the state of environmental components in the areas where oil and gas deposits are located should be systematic and carried out

throughout the entire period of deposits expluatation. The obtained research results must be used to predict the impact on the environment and develop measures to prevent or reduce this impact.

Research of the state of the water environment is part of comprehensive research in the areas where oil and gas deposits are located. The importance of the state of surface and underground waters is determined by their use in many spheres of human activity and life. The impact of oil and gas production on the aquatic environment is minimal, provided the equipment is operating normally. Problems can arise only in case of intentional violations or emergency situations.

Most often, pollution of the water environment is associated with the ingress of salt water and oil products into the soil, surface and groundwater. Such pollution manifests itself in an increase in the mineralization of water, the concentration, first of all, of sodium ions, potassium ions, chloride ions, as well as in an increase in the content of petroleum products.

During 2022, about 600 surface and underground water samples were taken in the studied territories of the oil and gas deposits in the Kharkiv, Poltava and Dnipropetrovsk regions. To control the chemical composition of surface and underground waters, sampling points that are evenly distributed within the deposits were selected. In places where there are no surface water bodies, existing wells and boreholes were used.

For more qualitative studies of the state of the water environment, the observation network should cover all runoff microbasins, within which all involved technological elements (oil and gas wells, pipelines, industrial sites, etc.) are located, thanks to the installation of additional observation wells [2].

In any event, no significant content of sodium ions, potassium ions and chloride ions has been detected in the water samples. It has been established that the presence of dissolved oil products in surface and underground waters is often associated with the activities of multi-industry enterprises within the deposits. Soil and groundwater contamination by petroleum products within the territories of agricultural enterprises is characteristic. In particular, most of the pollution is related to oil spills that occurred in the 80s of the last century.

The increased content of nitrates was characteristic of areas where domestic soil and groundwater pollution is observed. The increased content of sulfates was characteristic of areas with a significant decrease in the level of groundwater and the water level in surface water bodies. In addition, the increased content of sulfates and nitrates can be a consequence of the use of mineral and organic fertilizers within agricultural lands.

Thus, the negative impact of oil and gas activities on the state of surface and underground waters has not been detected. At the same time, the existing wells and boreholes within settlements are sometimes not enough for a qualitative assessment of the state of the water environment, which makes the perspective of our research.

References:

1. Pravila rozrobki naftovih i gazovih rodovishch: zatv. nakazom Min-va ekologiï ta prirodnih resursiv Ukraïni vid 15.03.2017 r. № 118. URL: http://zakon0.rada.gov.ua/laws/show/z0692-17#n13 (data zvernennya: 31.03.2023)

2. Dyadin D. V., Principles of installing local monitoring points of the ground and surface water at oil and gas production sites / Environmental safety and balanced use of resources № 2 (18), 2018, Pages 126–137.

3D TECHNOLOGY IN CONCRETE PRINTING

MARYNA LOZOVA, student
OLHA I. PERELYHINA Senior Teacher, Language Adviser
O. M. Beketov National University of Urban Economy in Kharkiv

3D concrete printing, also known as 3D construction printing, is a device to fabricate buildings or construction components in shapes that are impossible to take from concrete formwork. They can easily lay structures using curvilinear forms instead of typical rectilinear, which makes them more durable.

This technology has its own pros and cons. When it comes to pros, the printing products are in high quality, fairly low priced, time saving, and have the ability to create new, complex designs. The cost of a typical printed house is much lower than an equivalent customary built one. This is due to significantly lower use of cement, and it is considered eco-friendly because of the small amount of wasted building materials. Getting a house built with 3D technology can be completed in about a month in a half compared to the normal 6-month construction period. This can be extremely beneficial during an emergency situation where structures need to be built in as little time as possible. As for cons, the printing results have no building codes, that are important for structuring work and implementation in use. Also, materials are limited to concrete and plastics, therefore you cannot use them in constructions requiring wood or steel.

Exist three different technologies are currently used in 3D concrete printing: binder jetting, robotic shotcrete, and layered material extrusion. The first one of them is the most common and means binder jet printing, in other words powder bed and binder, where the powder bed is Portland cement and the binder is water. This mixture allows for a higher degree of geometric freedom, including the possibility to create unsupported cantilevers or overhangs and hollow parts, furthermore the left-over powder can be reused for future parts. Also, with binder jetting technologies has been demonstrated at large scale by Enrico Dini with D-Shape. D-Shape relies on a non-hydraulic Sorel cement that is based on sand activated with magnesium oxide in the powder bed and a liquid magnesium chloride solution as binder. The technology has been used to produce mainly furniture, such as a coffee table.