

RESULTS OF ENVIRONMENTAL MONITORING ON "UZBEKISTON MUSTAKILLIGI" INVESTMENT BLOCK IN 2020

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1. Introduction

In 2020, studies were carried out to assess the environmental impact of the following oil and gas operations:

- Drilling and testing of wells in "Mustakillikning 25 yilligi" field;
- Construction of Gas Processing Plant (GPP).
- The environmental monitoring objects are:
 - ✓ atmospheric air;
 - ✓ surface water bodies and streams;
 - ✓ soils, grounds and terrain landscape;
 - ✓ production and consumption waste;
 - ✓ flora and fauna;
 - ✓ radiation environment.

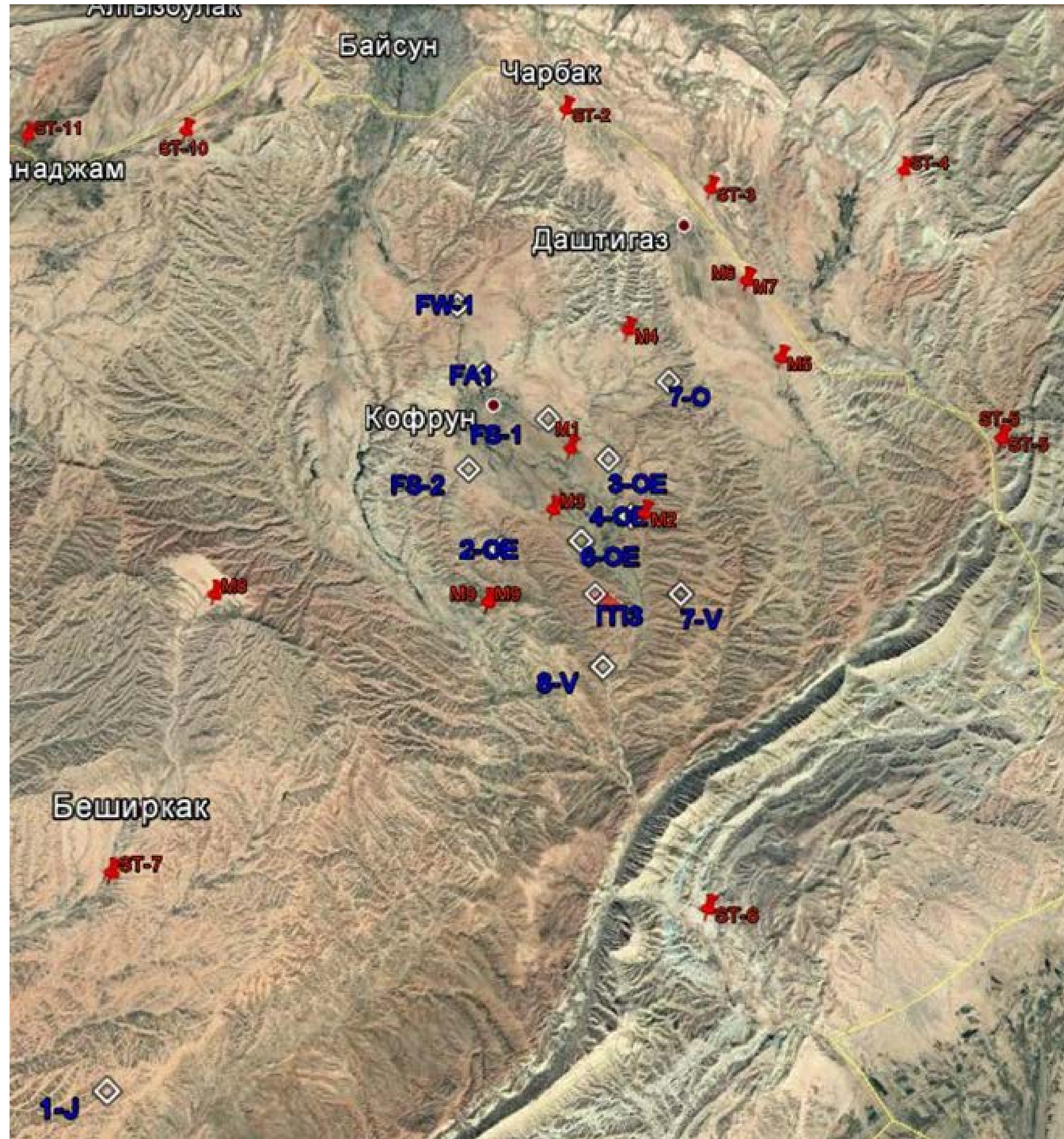
2. Purpose and tasks of study

The purpose of environmental monitoring is to assess the impacts carried out by SURHAN GAS CHEMICAL OPERATING COMPANY, FC LLC on the environment during its production activities in order to take timely measures to prevent violations.

The tasks are :

- ✓ assessment of the actual state of the environment;
- ✓ comparison of the information received with the data of the Environmental audit (2017-2018) carried out before the start of oil and gas operations;
- ✓ monitoring the state of the environment and ongoing changes in the contract area;
- ✓ predictive assessment of man-made processes impact on the state of the environment in the Contract area.

3. General principles of environmental monitoring



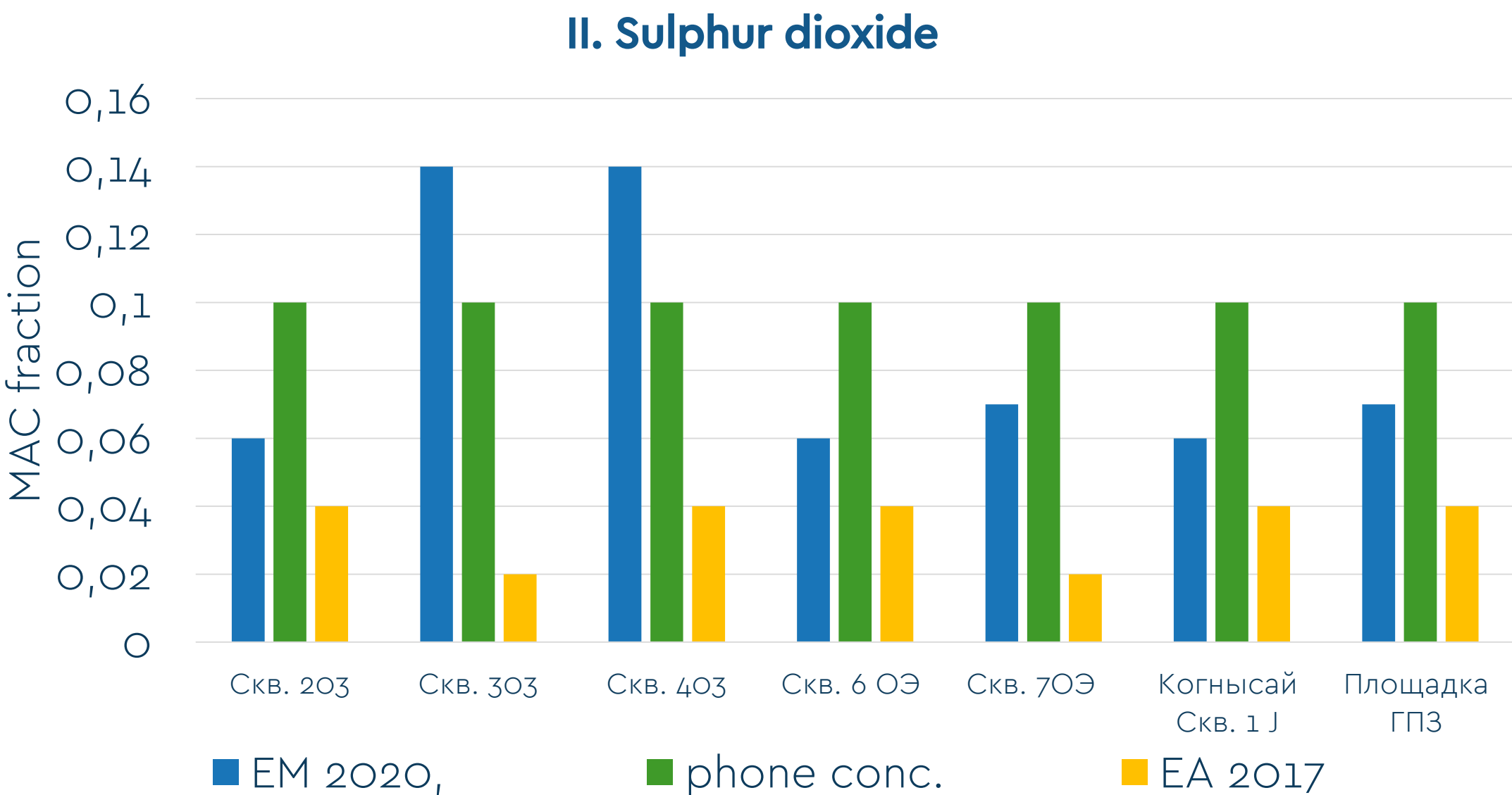
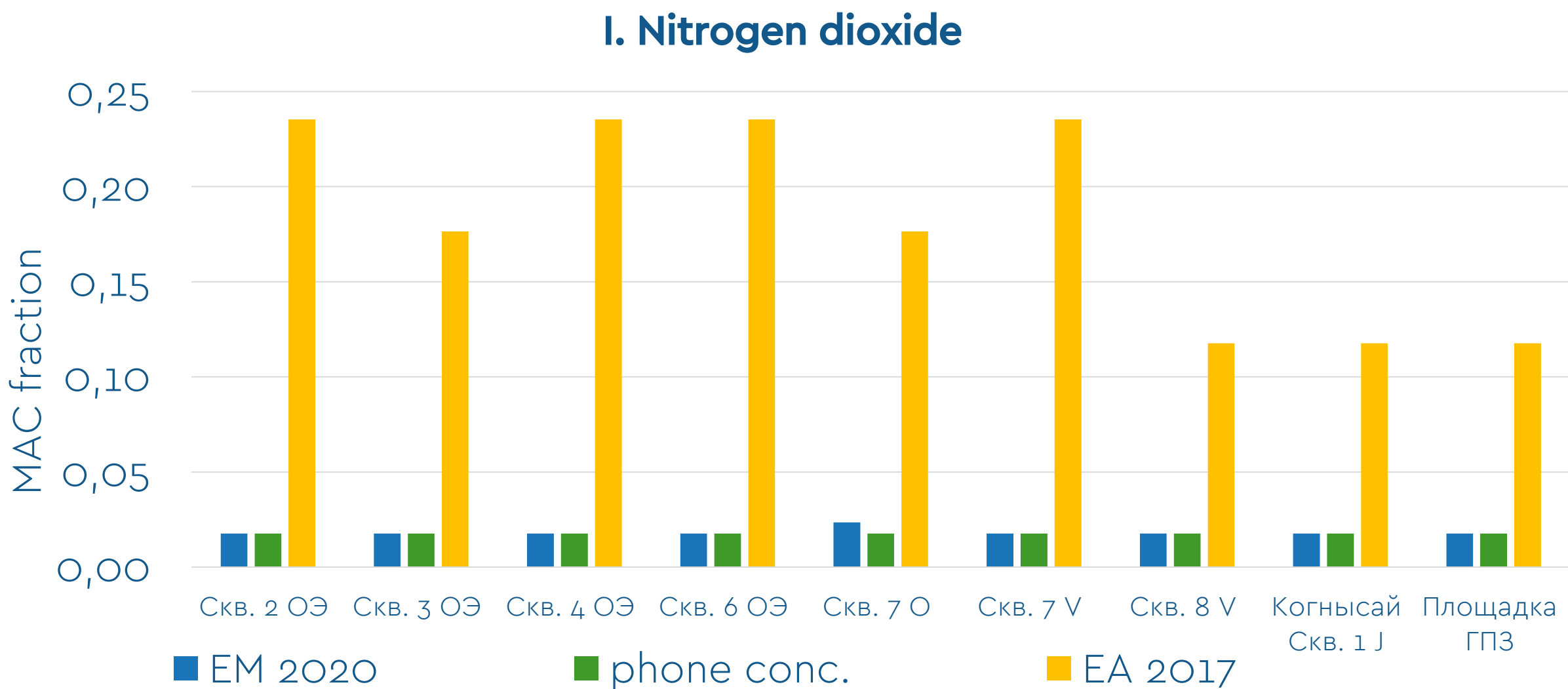
In 2020, Operator, within the scope of Environmental Monitoring (EM 2020), continued research to assess the impact of oil and gas operations on environmental facilities at "Uzbekiston Mustakilligi" Investment Block. The studies were carried out by BEZOPASNOST' I CONTROL', LLC within the scope of the concluded contract in accordance with the Program of Industrial Environmental Monitoring of the state of the environment during oil and gas operations at "Uzbekistan Mustakilligi" investment block carried out by Surhan Gas Chemical Operating Company, FC LLC in 2020.

The complex of environmental studies included a field survey of the terrain, flora and fauna, sampling of soil and ground, surface and groundwater, atmospheric air, with appropriate laboratory analyzes, processing of results and issuing conclusions. At each local and background observation point, in accordance with the Calendar Schedule, samples of atmospheric air, surface water, soil were taken, and radiation measurements were also carried out.

The map shows the security stations of Ecoaudit 2017-2018 (EA 2017) - the names of the points are marked in **red** and the points of Ecomonitoring 2020 (EM 2020 - **dark blue color**).

4. Environmental monitoring results

4.1 Atmosphere

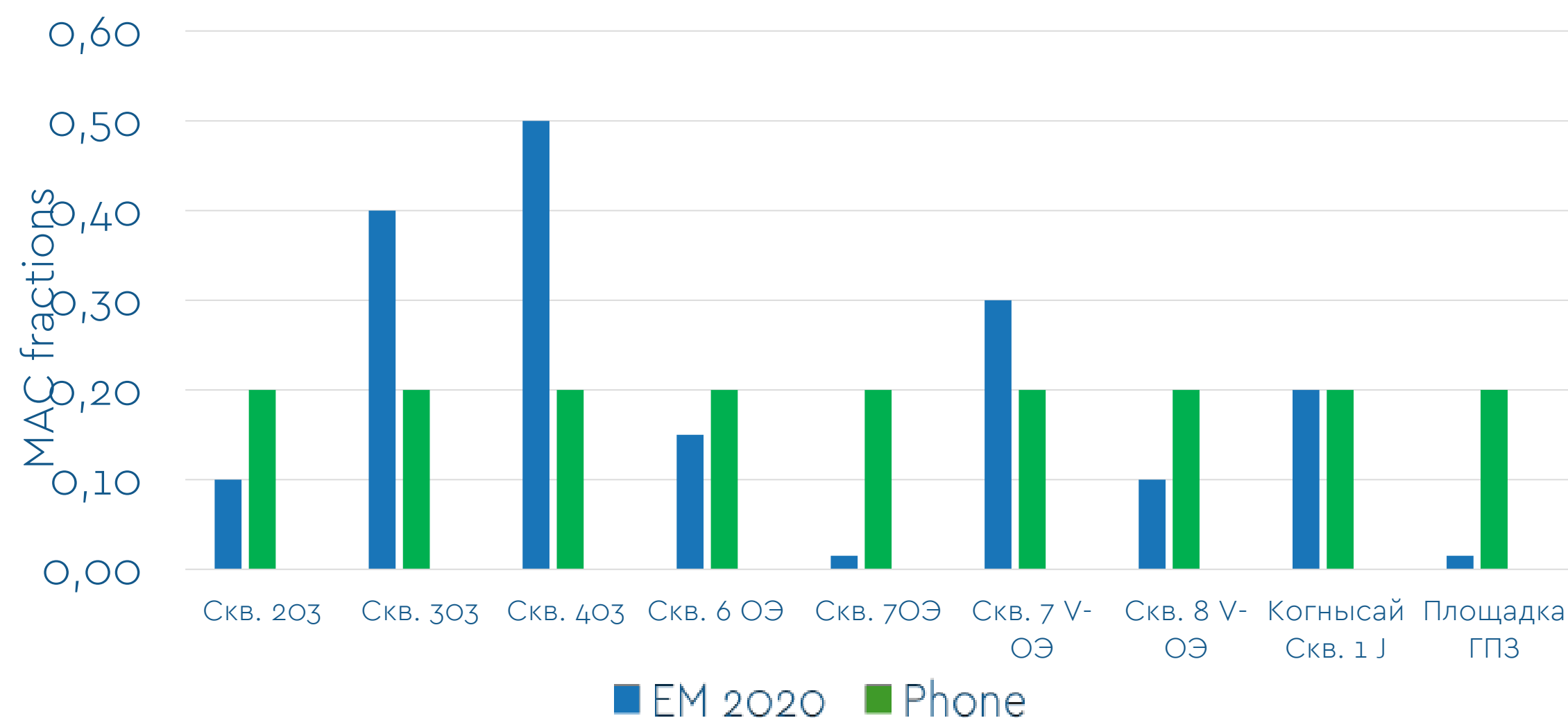


The survey results showed the following.

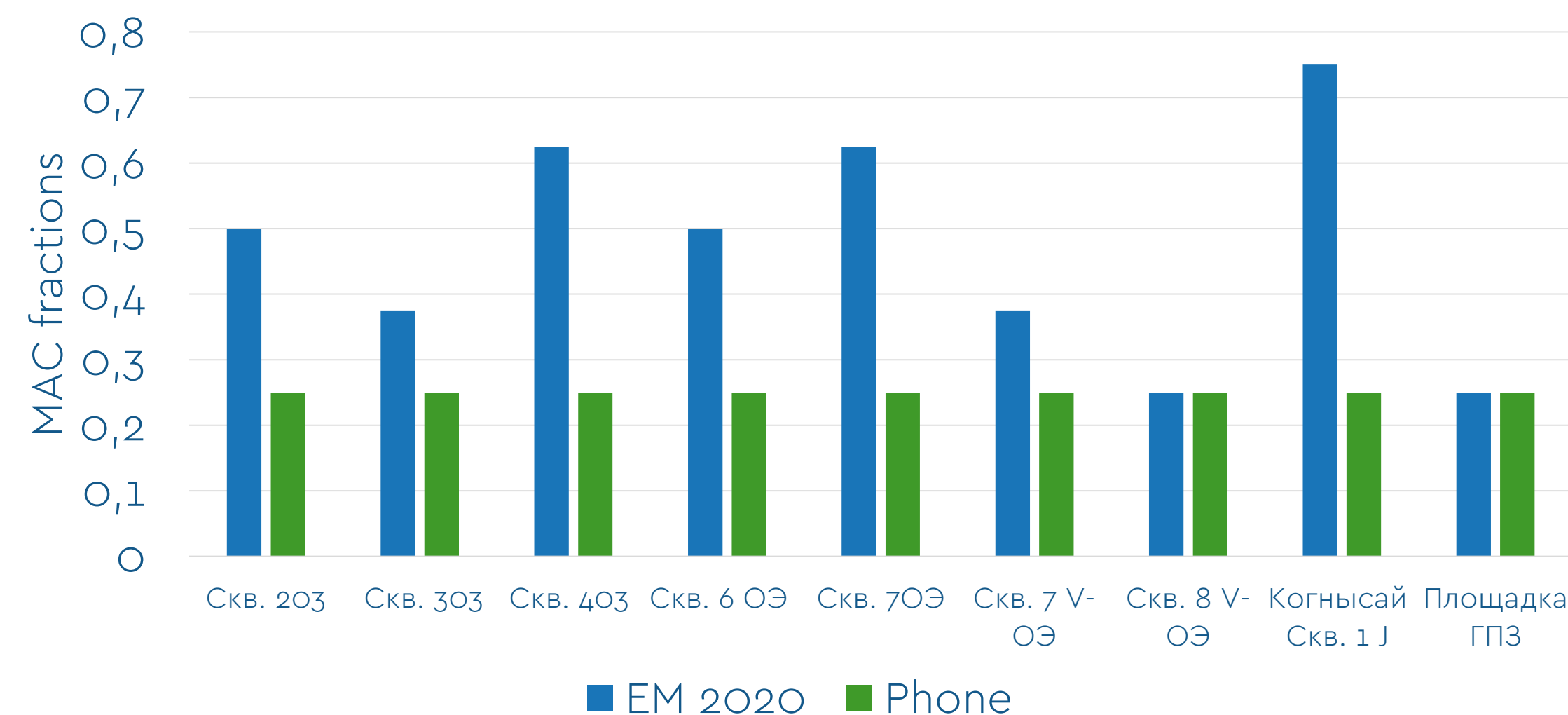
I the content of **nitrogen dioxide** in the atmospheric air of the entire surveyed area did not exceed the established level of maximum allowable concentration, and is significantly lower than the established standard values (0.023 MAC) both at background and at local observation points, which is much lower than EA 2017 (0.24 MAC).

II the content of **sulfur dioxide** in the atmospheric air did not exceed the maximum allowable one-time concentration throughout the entire surveyed territory, and was at the level of 0.1-0.14 maximum allowable one-time concentration. In comparison with EA 2017, 0.04 MAC, and background concentrations were within 0.1 MAC

III. Hydrocarbons



IV. Hydrogen sulphide

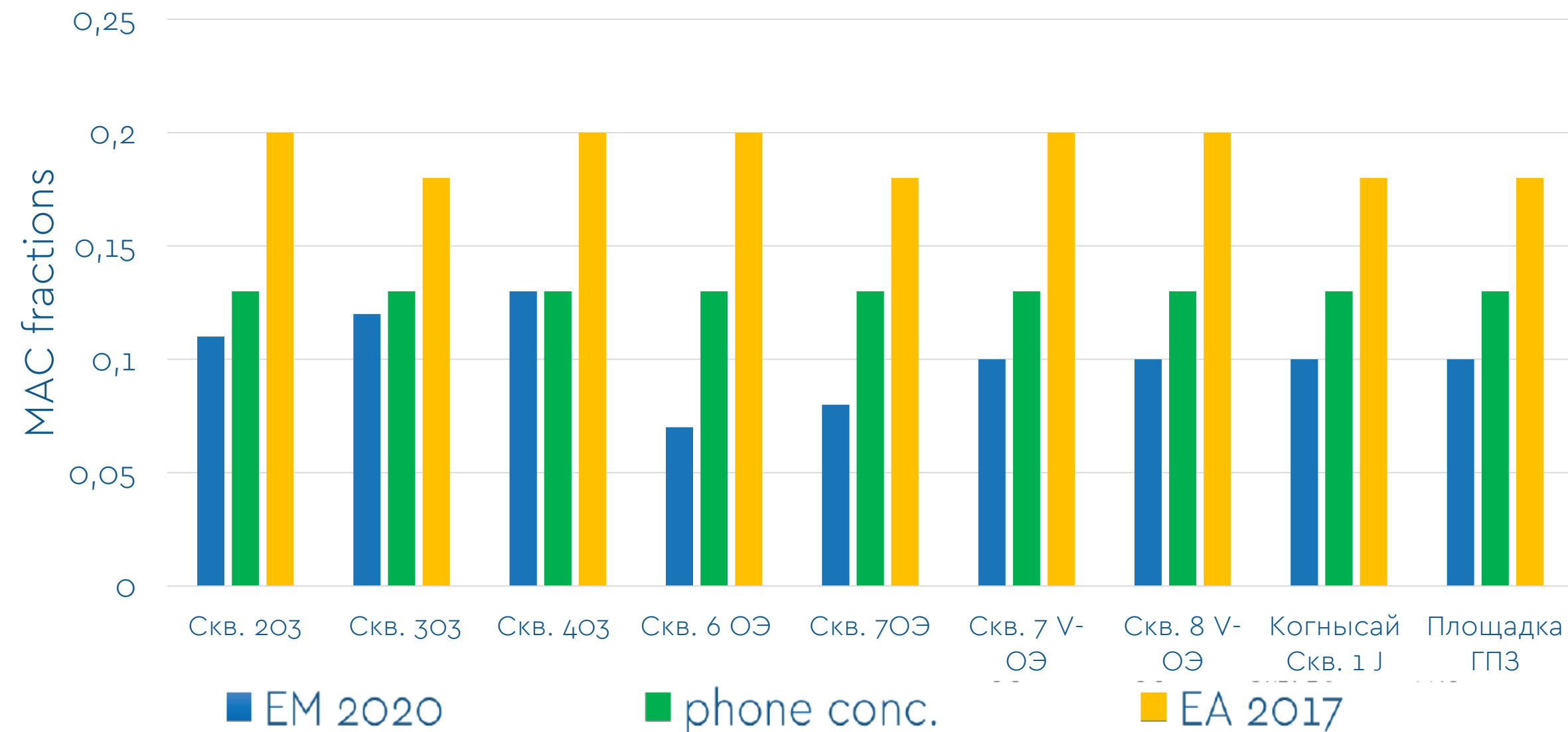


III. The total amount of **hydrocarbons** was below the maximum allowable concentration and did not exceed 0.5 maximum allowable one-time concentration, the background concentrations did not exceed 0.2 MAC.

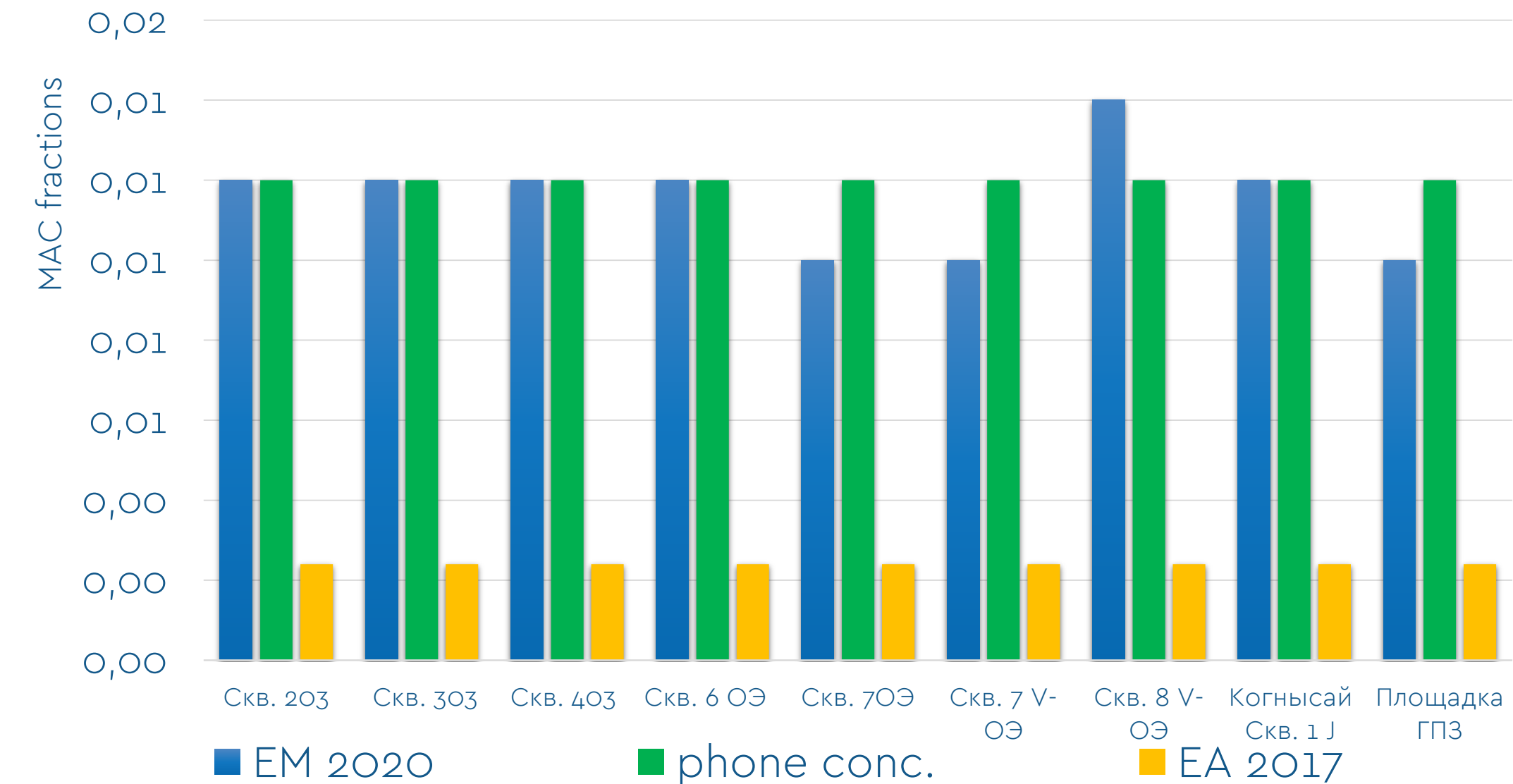
IV. The **hydrogen sulfide** content did not exceed the established MAC level. The maximum level of hydrogen sulfide concentration in three stages was noted at wells No. 6-OE (0.625 maximum allowable one-time concentration) and Kognysay-1J (0.75 maximum allowable one-time concentration), which is higher than background concentrations, which did not exceed 0.2 maximum allowable one-time concentration.

EA 2017 studies did not record the presence of hydrocarbons and hydrogen sulfide in the air.

V. Inorganic dust



VI. Carbon oxide



V. the content of **inorganic dust** (dust content of the atmospheric air) of the entire surveyed area at three stages of observation also did not exceed the MAC, and was below the values of both background and EA 2017.

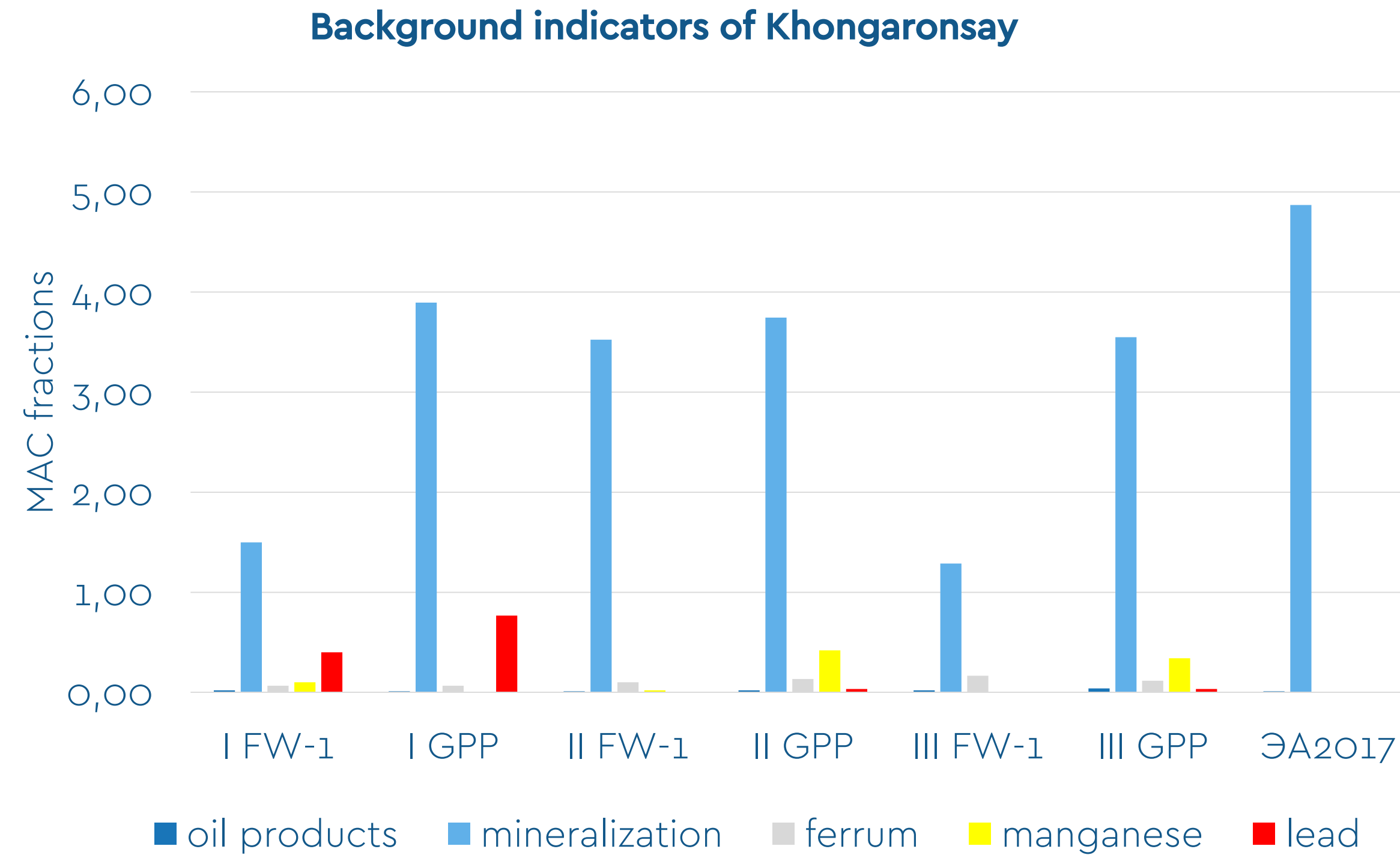
VI. the content of **carbon oxide** in the atmosphere throughout the entire surveyed area did not exceed the established level of maximum allowable concentration at all observation points in all three stages of survey. Indicators of background points and EA 2017 are also below 0.1 maximum allowable one-time concentration

The survey results showed that the level of atmospheric air pollution with inorganic dust, carbon oxide, nitrogen dioxide, hydrocarbon and hydrogen sulfide in the contract area does not exceed the MAC and background indicators.

Conclusion: atmospheric air does not experience increased anthropogenic load.

4. Results of environmental monitoring

4.2 Surface water



Surface watercourses at the site of oil and gas operations are represented by one watercourse - Khongaronsai, the channel of which passes through Boysun town and Kofrun village and further, cutting through mountain upheavals, enters the valley of the Surkhandarya River. The composition of water along the river bed varies from brackish (1500 mg/dm³, point FW-1) to saline (3900 mg/dm³, point of GPP), in the summer period the water composition is salty (from 3524 to 3745 mg/dm³) and in the autumn period from 1287 (brackish) to 3549 mg/dm³ (salty).

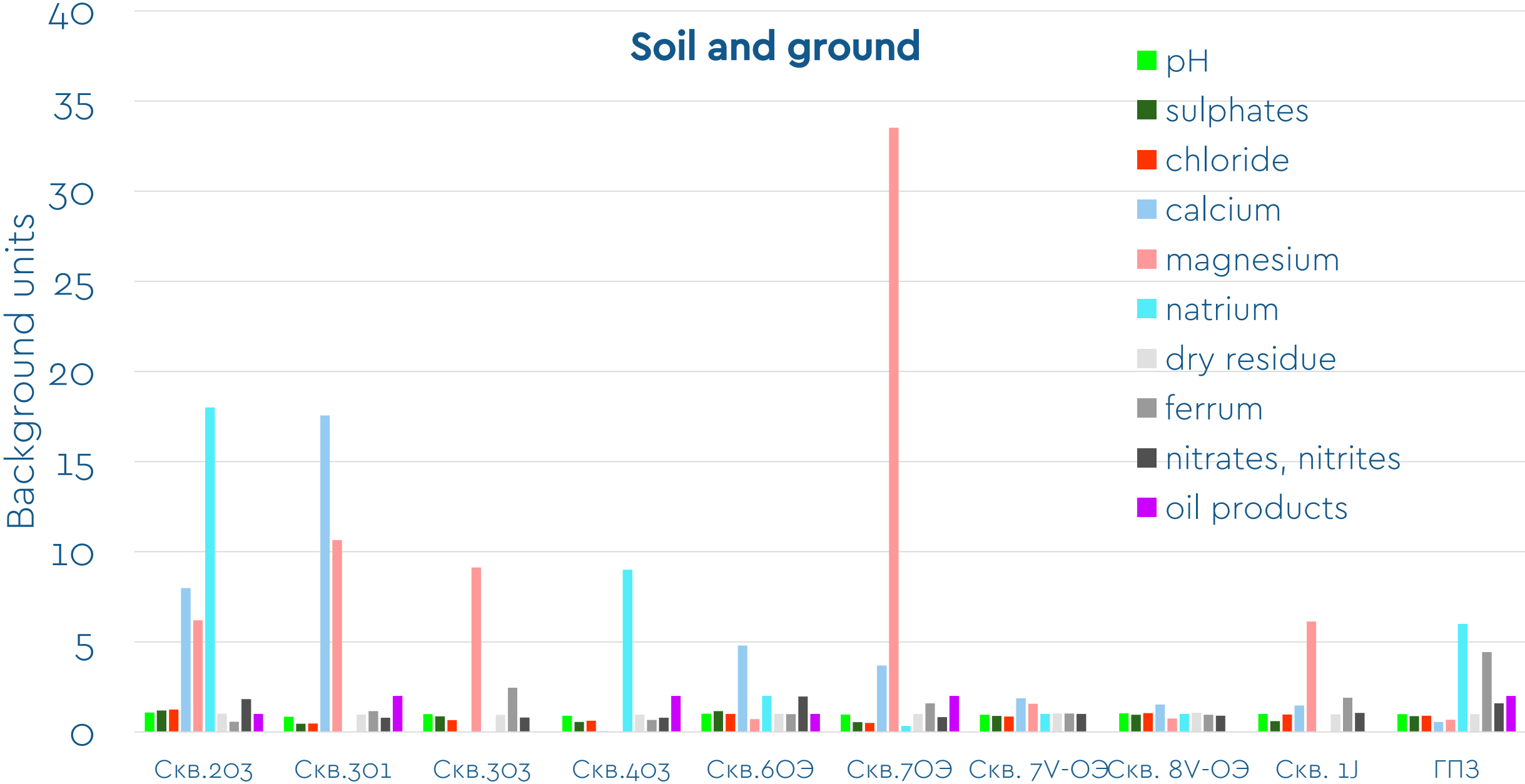
Analysis of iron, manganese, lead, hydrogen sulphide, and oil products in water did not reveal any contamination exceeding the MAC. The quality of the Khongaronsai water when passing through the oil and gas operations area remains stable within the framework of SanPiN of RUz № 0318-15. This indicates that the watercourse from the construction sites of Mustakillikning 25 Yilligi field does not experience technological stress.

4. Results of environmental monitoring

4.3 Soil and ground

The analysis of the degree of pollution and changes in the chemical composition of soil and ground was carried out on the basis of comparison with the soil and ground of the background points - FS-1 and FS-2. The result of comparative analyzes of soil and grounds showed that at all background points there are no abnormal contents of oil products and phenols. The indicators have similar values of the content of chlorides, calcium, magnesium. The soil and ground of background points and local points located at the wellhead, drill mud pit and fuel and lubricants have a comparable composition and properties in terms of pH, sulfates, chlorides, total salt, nitrates, nitrites and oil products. Abnormal overshoots were found in magnesium, sodium and calcium wells under construction.

At the construction site of gas processing plant, no abnormal excess of the analyzed components in soil and ground was revealed.

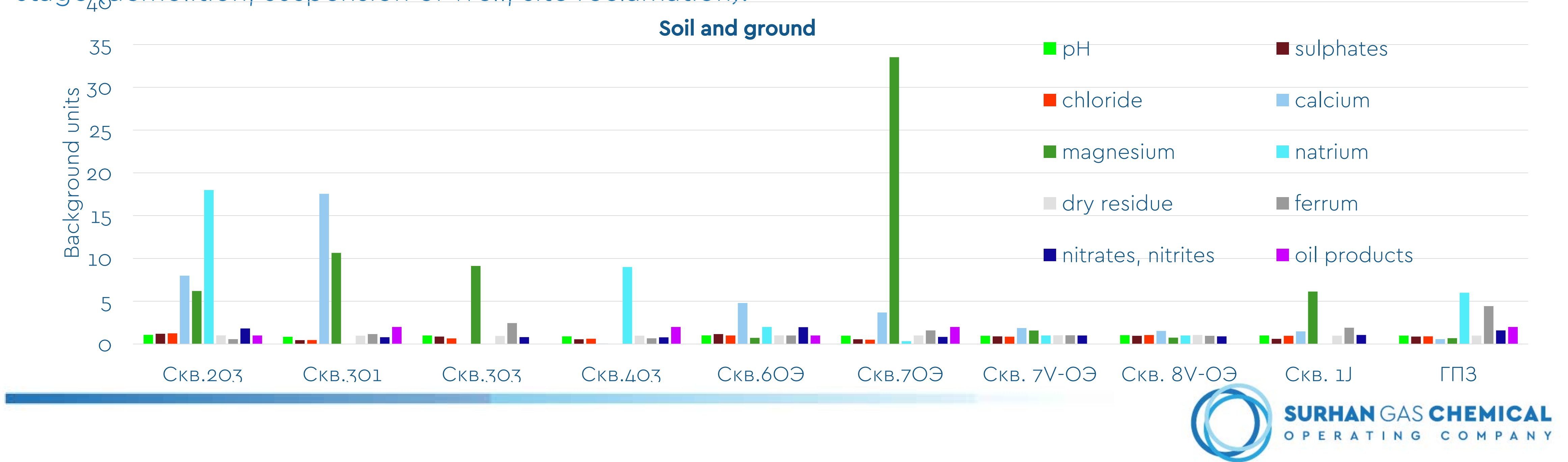


These pollution factors indicate the need for remediation of the drill site after completion of drilling operations, which are provided for by the Regulations for neutralization/disposal of drilling waste at the completion stage (demolition, suspension of well, site remediation).

4. Results of environmental monitoring

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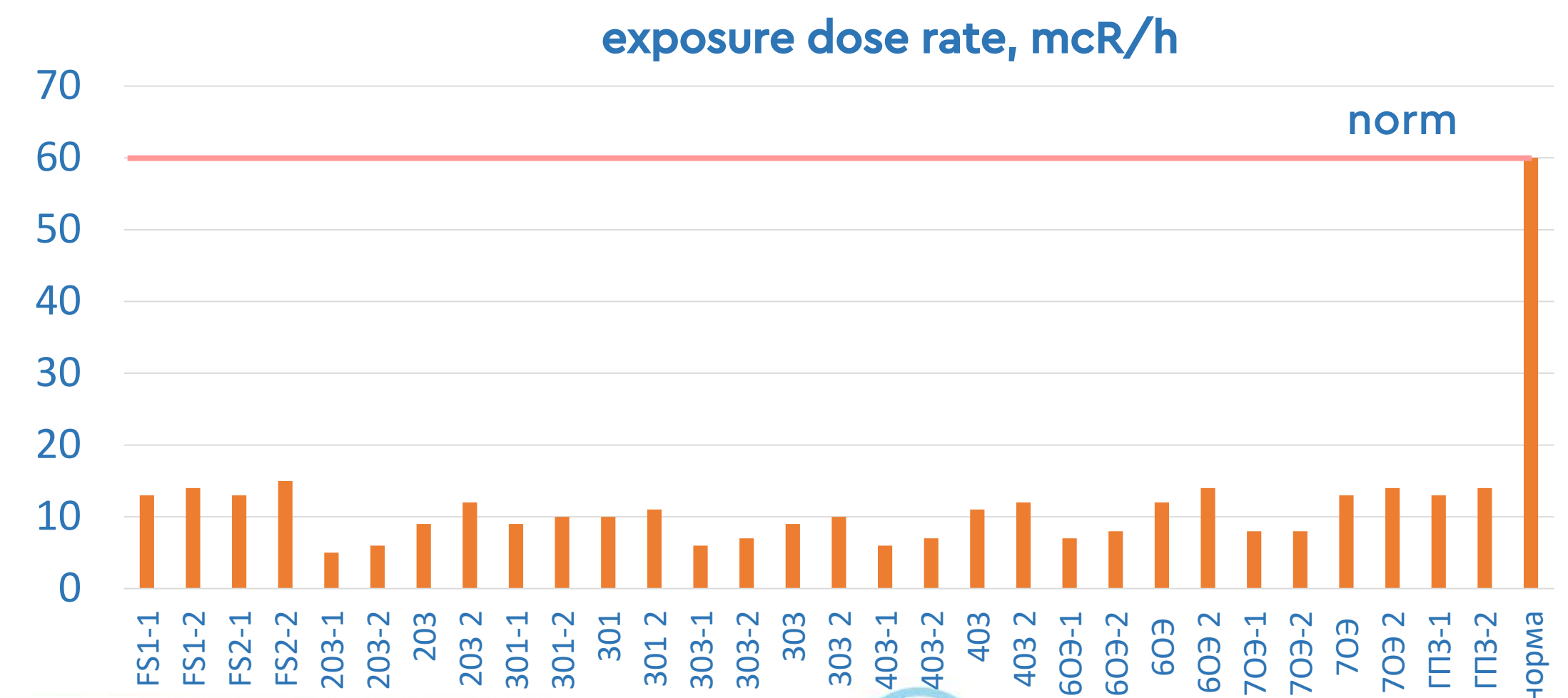
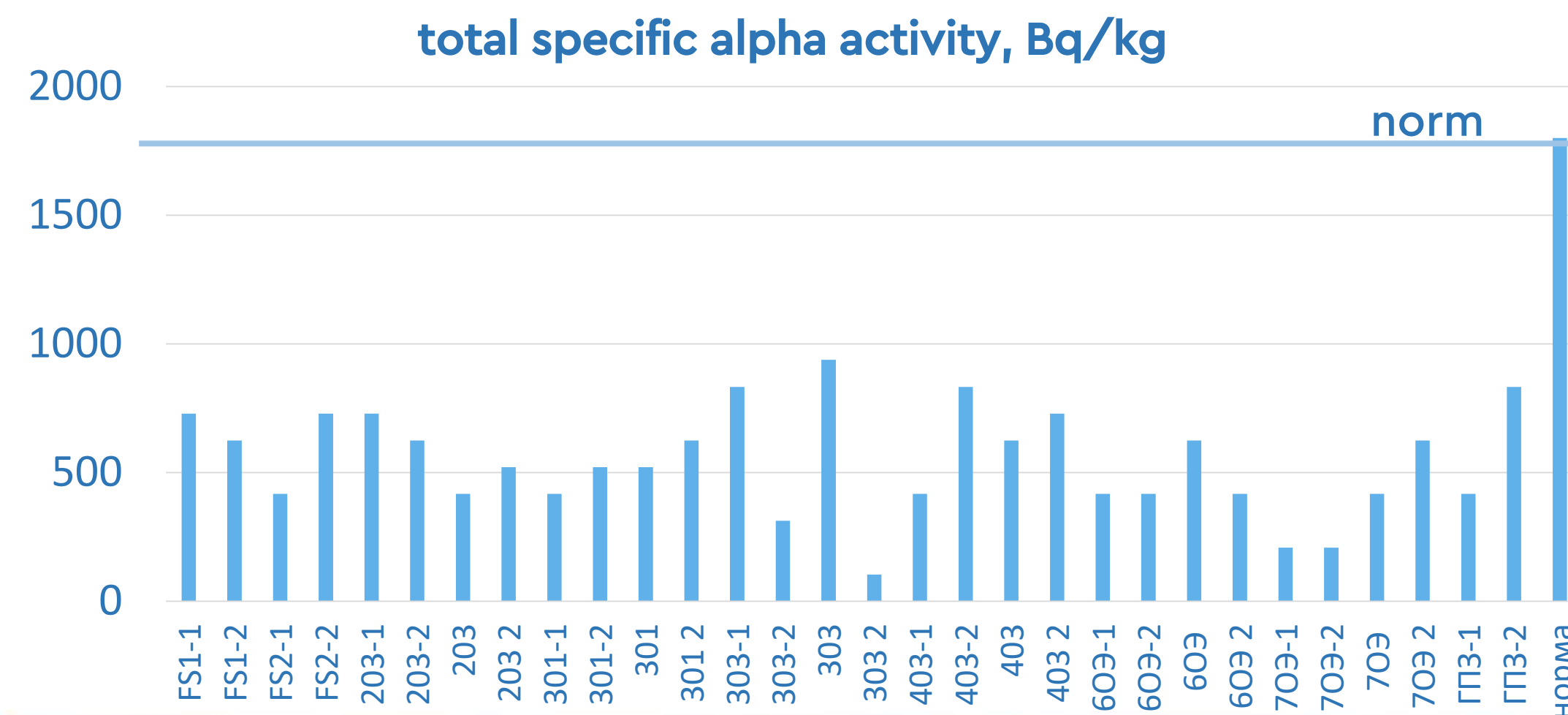


4. Results of environmental monitoring

4.4 Environmental radiation monitoring

Survey within the scope of radiation-hygienic monitoring carried out in June and October, 2020, included measurements of the content of natural radionuclides in surface, waste and domestic water, measurement of the total specific alpha activity and exposure dose rate of external gamma radiation in soil and ground on cluster sites, single boreholes and facilities of GPP construction complex. No excess of the normative indicators was found, no negative impact on the natural environment in connection with production activities related to the radiation factor was revealed.

The radiation and environmental situation is favorable for conducting economic activities and, compared to the data of EA 2017, remained at the same level. The exposure dose rate of external gamma radiation corresponds to natural indicators for the Republic of Uzbekistan. The values of the total specific alpha activity in soils at background and local monitoring points characterize them as uncontaminated with alpha-active radionuclides. The content of natural radionuclides in surface, waste and drill water does not exceed the intervention levels and approximate permissible concentrations.



4. Results of environmental monitoring

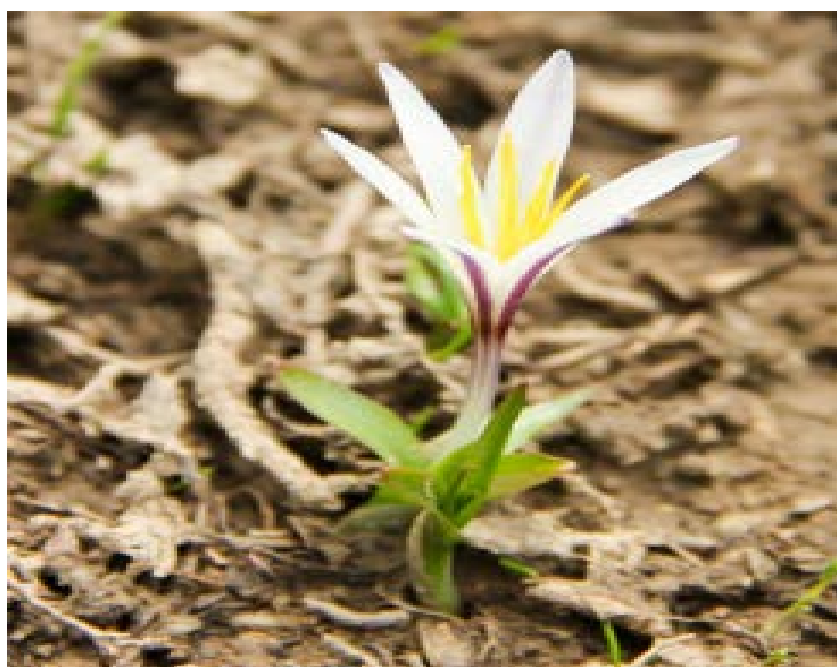
4.5. Flora and fauna

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According to the results of field work in 2020, **163 plant species** were registered (including 4 fruitful generative specimens of the Red Book species *Tulipa korolkowii* and 9 generative specimens of the Red Book species *Lagochilus inebrians*).

In just three stages, **58 species of fauna** were noted: 1 species of amphibians and 14 species of reptiles, 35 species of birds and 9 species of mammals, of which 11 species are included in the Red Book of Uzbekistan: 2 species of reptiles, 8 species of birds, 1 species of mammals.

It has been established that the operation of existing or suspended wells does not have a negative impact on the objects of fauna. The presence of large scavengers and other rare birds of prey indicates a balanced state of the environment on the territory of the deposit and a minimal negative impact of man-made processes on the fauna. Keeping lists of observations of fauna objects, by personnel constantly present at the field, supplement the data of departmental monitoring.



5. Conclusions

Thanks to the implementation of environmental measures, as well as regular industrial environmental control and monitoring of technological processes and atmospheric air state objects, surface and ground water, soil and ground, in 2020 we can note the absence of a direct and tangible impact on the environment from the activities of SURHAN GAS CHEMICAL OPERATING COMPANY, FC LLC.

The results of environmental monitoring in 2020 showed that the state of flora and fauna outside the areas allocated for construction work remains stable, no significant impact on flora and fauna of the contract areas has been identified.



THANK YOU FOR ATTENTION!