

Surface waters (Mountain Rivers) and underground waters (wells) are used as water sources for household and drinking purposes in Almaty. Currently, 70% of the water supplied to the city is underground water supply sources, which are extracted from wells up to 500 meters deep. There are 386 artesian wells in total. Surface sources include the Bolshaya and Malaya Almatinka, Kim-Asar, Kargaly, and Aksay rivers [5]. The city's water supply system operates tens of kilometers of water networks built from metal pipes. Their gradual wear and corrosion fouling, and poor quality of sanitary fittings lead to frequent accidents, interruptions in water supply, water leaks, as well as secondary pollution in water supply networks on the way to the consumer. As a result, the quality of water intended for household and the drinking needs of the population is deteriorating, which in turn requires constant monitoring and the adoption of measures to prevent pollution. The city of Almaty needs a serious revision and reconstruction of its water supply systems. According to the Almaty Development Center JSC, "the depreciation level of networks in the city is 65.9%, and water supply losses are 25.7%. For example, in the Nauryzbay district of the city, only 15% of the population is provided with water supply; the system was built by the population of the district on their own and does not meet building standards [6]. The quality of the drinking water accessed by the population is clearly of major importance, not only in terms of the actual quality as measured by its chemical, biological, qualities, but also in terms of people's perception of this water's quality. Over 40% of respondents asserted that there is a problem with the quality of drinking water. The main water quality issues highlighted by the population included coloration of the water, dirty water containing sediment, and water leaving stains on the dishes. Nearly a third of the respondents who had problems with water quality highlighted taste as a problem; 14% of the respondents who considered water quality to be an issue cited the main problem as being the fact that the water is salty [7]. The main reason for treating drinking water were poor water quality and health concerns. The fact that the water is opaque was by far the most common argument; a large number of people mentioned that they need to treat their drinking water to eliminate particles. About a quarter of the households that treat their water do so for health reasons, with taste being a secondary consideration [7].

As a result of anthropogenic impact on the envi-

ronment, the chemical composition of not only surface but also groundwater has noticeably changed. Despite the relatively high protection from groundwater pollution compared to surface waters, they already contain heavy metals (Al, Si, Cr, Mn, Fe, Zn, As, Ba, Pb, Hg, Se, Ni, Cd, Sr, Li, Cs, Co, Cu, and Ti), and petroleum hydrocarbons and potential sources of contamination, includes urban, agricultural activities, electrical and electronic waste disposal, and fuel storage facilities [8–9]. At present, there is a trend towards an increase in cases of detection of nitrates and phosphates in water from wells, which indicates the release of mineral and organic fertilizers into aquifers [10]. Despite the absence of industries that would pollute the reservoirs supplying Almaty with drinking water, the main problems caused by the quality of drinking water in the city are the poor condition of water utilities and the vital activity of buildings located adjacent to water protection zones, which in turn contaminates water sources in Almaty [6].

Requirements for the quality of drinking water are based on the principle of epidemiological safety, harmlessness in chemical composition and favorable organoleptic properties. In accordance with regulatory requirements [11] heavy metals, toxic organic compounds, pesticides, radioactive elements in drinking water should be absent, and chlorides, sulfates, nitrates should not exceed their MAC value. Therefore, the quality of water supplied to the population is constantly monitored [12]. But for this study some toxicants like toxic organic compounds, pesticides and radioactive elements were not analyzed due to the lack of their sources. The study of drinking water and water supply systems, their examination, and practical work on protection is a necessary condition for regulating the accumulated environmental problems of Almaty [11–13]. A comprehensive chemical assessment of the composition of drinking water determines the potential hazard of chemicals present in drinking water samples for public health [14], taking into account the assessment of sanitary conditions and the epidemiological situation in various districts of Almaty.

Based on the results of the analysis, a list of indicators, the number and frequency of drinking water sampling for continuous monitoring are proposed [12]. Our work is devoted to a preliminary study and assessment of the quality of drinking water in the districts of the city of Almaty in order to reveal possible pollution of drinking water due to public concern.