# BRITISH MEDICAL JOURNAL

*British Medical Journal Volume-2, No 4*
*10.5281/zenodo.7061700*
**British Medical Journal**
**Volume 2, No 1., 2022**
**Internet address:** http://ejournals.id/index.php/bmj
**E-mail:** info@ejournals.id
Published by British Medical Journal
Issued Bimonthly
3 knoll drive. London. N14 5LU United Kingdom
+44 7542 987055
Chief Editor
**Dr. Fiona Egea**

*Requirements for the authors.*

*The manuscript authors must provide reliable results of the work done, as well as an objective judgment on the significance of the study. The data underlying the work should be presented accurately, without errors. The work should contain enough details and bibliographic references for possible reproduction. False or knowingly erroneous statements are perceived as unethical behavior and unacceptable.*

*Authors should make sure that the original work is submitted and, if other authors' works or claims are used, provide appropriate bibliographic references or citations. Plagiarism can exist in many forms - from representing someone else's work as copyright to copying or paraphrasing significant parts of another's work without attribution, as well as claiming one's rights to the results of another's research. Plagiarism in all forms constitutes unethical acts and is unacceptable. Responsibility for plagiarism is entirely on the shoulders of the authors.*

*Significant errors in published works. If the author detects significant errors or inaccuracies in the publication, the author must inform the editor of the journal or the publisher about this and interact with them in order to remove the publication as soon as possible or correct errors. If the editor or publisher has received information from a third party that the publication contains significant errors, the author must withdraw the work or correct the errors as soon as possible.*

*British Medical Journal Volume-2, No 4*
*10.5281/zenodo.7061700*

# HYGIENIC ASPECTS OF CLEANING AND DISINFECTION OF ECONOMIC AND DOMESTIC WASTEWATER

**Guzal Iskandarova**, Professor at Tashkent Medical Academy, Republic of Uzbekistan
**Aziza Yusupkhujaeva**, Senior Teacher at Tashkent Medical Academy, Republic of Uzbekistan
**Nargiz Samigova**, Associate Professor at Tashkent Medical Academy, Republic of Uzbekistan
**Guzal Sherkuzieva**, Associate Professor at Tashkent Medical Academy, Republic of Uzbekistan
**Shakhnoza Kurbanova**, Associate Professor at Tashkent Medical Academy, Republic of Uzbekistan

Tashkent Medical Academy
guzaliskandarova13@gmail.com
aziza.yusuphojaeva@gmail.com
nargiz.samigova@gmail.com
guzal.sherquzieva@gmail.com
shahnoza.kurbanova5@gmail.com

**Relevance:** The last decade is characterized by strong loads affecting water bodies and streams. There is a rapid deterioration of the quality of the water environment, which poses a great threat to the country's ecological, food and national security. The large-scale degradation processes occurring in the hydrosphere lead to various conditions and situations in terms of their origin and nature. It is possible to add to them situations that determine the violation of the structural and functional organization of the water ecosystem, the reduction of the water bodies' water management, fishing and recreational potential, the reduction of their ecological characteristics, and the state of social involvement of the areas inhabited by people.

**Aim of the study** Indicators of waste water of household and industrial enterprises.

**Materials and methods of research.** Theoretical and practical experiences were used in conducting scientific research. It was based on laboratory data in the study of chemical and biological parameters of waste water. Evidence-based medical methods were used in the statistical processing of the obtained results.

**Keywords:** sewage, waste water, aeration, clarifier, grid, aerotank, suspended matter, biological treatment, activated sludge, neutralization, sodium hypochlorite.

**Introduction.** In the national strategy of stable socio-economic development of the country, solving the problem of water bodies and ensuring their safety for the health of the population is included among the priority activities. This is especially relevant in connection with the development of tourism and the activation of recreational use of water bodies for health purposes [1].

The economic complex of the Republic of Uzbekistan faces the task of increasing investment activity aimed at reducing the risk to the health of the

population, because the prediction of a more than two-fold increase in the production of industry and agriculture in the country creates a risk of determining the increase in environmental loads [2].

One of the threats to sustainable development in the future is the growing man-made and socio-industrial loads on the human organism, the negative effects on the health of the population and the level of general public health. As such, the purpose of our investigations is to study, evaluate and analyze the impact of these factors.

**Materials and methods of research.** Theoretical and practical experiences were used in conducting scientific research. It was based on laboratory data in the study of chemical and biological parameters of waste water. Evidence-based medical methods were used in the statistical processing of the obtained results.

The large number of chemical pollutants, the lack of information about their effects, especially the mechanisms of their combined effects, and the combination of different ways of entering the body, complicate the qualitative and quantitative assessment of the health level of the population or individual groups, as well as the integrated analyzes of the "environment-health" system [ 3, 4].

In this regard, in front of the employees of the sanitary-epidemiological service, there is a task of modern implementation of recommendations based on as one of the elements of the various socio-economic development of the region, the corrections and scientific-scientific methods forming the technological scheme of the socio-hygienic monitoring in order to further emphasize the activities of the health care practical structures, measures for the hygienic diagnosis of the environment and the prevention of diseases [5].

The main problems related to the use of water bodies and their protection are the pollution of water sources and, in connection with this, a number of cases of unsatisfactory water status. In general, the water supply and sanitation system is inadequate due to outdated facilities or inadequate infrastructure. In Uzbekistan, 63.0% of the population, 30.7% of the urban settlements, and 0.7% of the rural settlements are covered with centralized sewerage. The total capacity of sewage treatment facilities is 4180.7 thousand $m^3$/day. The main amount of wastewater with pollutants is formed from residential utilities (75.4% of the total volume of wastewater containing pollutants) [6, 7].

**Results.** Currently, the Bozsu, Salar and Bektemir aeration stations are operating from the facilities for the treatment of household and economic waste water from the population of Tashkent, and the Salar aeration station cleans 1 million 350 thousand m3 of waste water in one day (according to the project, 950 thousand m3).

Bozsu aeration station - the main task of BAS is mechanical and biological treatment of wastewater coming to the station territory, neutralization, treatment of sludge, excessive activated sludge and use of facilities for economic purposes.

Bozsu airport was commissioned in 1963 with a capacity of 25,000 $m^3$/day. The air station is located in the Zangiota district of the Tashkent region, and its total area is 112 hectares. The station is designed to treat waste water from residential areas and industrial enterprises in five districts of Tashkent: Almazor, Chilonzor, Uchtepa, Yunusabad and Shaikhontokhur. Waste water comes to the facility from Kara Kamish D-2000, Chilonzor D-1700 and South-West collectors D-2000. The

first stage of the Bozsu air station was commissioned in 1963 with a capacity of 525 thousand $m^3$/day and the second stage in 1991 with a capacity of 210 thousand $m^3$/day, and the current capacity is 850 thousand $m^3$/day.

Wastewater treatment facilities include the following main technological workshops: mechanical cleaning workshop; biological treatment workshop; wastewater treatment facilities; sediment treatment; chief energy department; chief mechanical department; chemical and bacteriological laboratories.

The plant's capacity for full biological treatment is equal to 750,000 $m^3$/day wastewater. It is necessary to get acquainted with the sequence of placement of these devices before evaluating the working condition and efficiency of each stage of cleaning at the station and the devices present in it.

Wastewater treatment at the station is carried out in three stages - mechanical, biological and neutralization stages. There are basic cleaning devices used in each cleaning stage, which include: mechanical screens, primary clarifiers, sandblasters in the mechanical cleaning stage. Their main task is cleaning of small and large suspended substances in waste water. The second stage is the stage of biological treatment, which mainly uses aeration tanks at the station, and the main task of these devices is to neutralize organic substances in the waste water. Finally, the third stage of treatment is the stage of disinfection of waste water, which removes pathogenic viruses and bacteria from the waste water. At BAS (Bozsu Aeration Station), sodium hypochlorite obtained from ordinary technical table salt is used for this process.

**Table 1**

**Performance indicators of BAS cleaning devices**

| № | Name of ingredients | Unit of measurement | Entrance to the station | Mechanical cleaning after mechanical cleaning | After biological treatment | Place for disposal of treated waste water | |
|---|---|---|---|---|---|---|---|
| 1. | Temperature | grad. | 20,5 | 20,5 | 20,5 | 20,5 | - |
| 2. | PN | | 7,75 | 7,75 | 7,75 | 7,72 | - |
| 3. | Sediment | ml/l | 3,8 | 0,6 | 0,4 | 0,3 | - |
| 4. | Suspended substances | ml/l | 71,5 | 41,3 | 19,6 | 12,0 | 23 |
| 6. | Sediment density | ml/l | 367 | 346 | 315 | 272 | - |
| 8. | Dry residue | мг/л ml/l | 434 | 401 | 367 | 306 | 486 |
| 9. | Ammonium nitrogen | ml/l | 15,31 | 10,92 | 7,43 | 5,05 | 6,4 |
| 10. | Nitrogen nitrite | ml/l | 0,17 | 0,15 | 0,13 | 0,095 | 0,18 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 11. | Nitrogen nitrate | ml/l | 0,96 | | 2,69 | 3,67 | 9,1 |
| 12. | Total nitrogen | ml/l | 16,43 | | 9,99 | 8,77 | |
| 13. | Iron | мг/л ml/l | 0,32 | 0,25 | 0,20 | 0,092 | 0,18 |
| 14. | Phosphates | мг/л | 1,51 | 1,14 | 0,94 | 0,72 | 1,9 |
| 15 | Stagnation | % | 10 | 11 | 90 | 90 | |
| 16 | Sulfates | мг/л ml/l | 104,89 | | | 56,45 | 56,2 |
| 17 | Dissolved oxygen | мг/л ml/l | 1,62 | 2,84 | 4,53 | 5,80 | |
| 18 | Oxidation | ml/l | 35,8 | 26,33 | 15,06 | 13,10 | |
| 19 | Biochemical reaction to dissolved $oxygen_5$ | ml/l | 36,58 | 27,34 | 15,93 | 13,29 | 24 |
| 20 | Biochemical reaction to dissolved oxygen | ml/l | 116,1 | 93,56 | 70,06 | 51,17 | 82 |
| 21 | Oil products | ml/l | 1,27 | | | 0,24 | 0,29 |
| 22 | $Chromium^{+6}$ | ml/l | 0,064 | 0,044 | 0,018 | 0,0085 | 0,008 |
| 23 | Chlorides | ml/l | 53,88 | | | 41,86 | 36 |
| 24 | Koli is an index | piece /l | $1001*10^5$ | | $23*10^5$ | 398 | 1000 |
| 25 | Artificial surfactants | ml/l | 1,18 | | | 0,63 | 2,9 |
| 26 | Copper | ml/l | 0,018 | | | 0,0025 | 0,0025 |

*(note): the devices are operating efficiently, providing a steady process of wastewater treatment for all key ingredients.

In 2017, as a result of the modernization works carried out at the Bozsu air station at the expense of funds allocated by the Islamic Development Bank, the overall efficiency of the station increased from 52% to 78%. As can be seen from the given table, the waste water coming to the station for treatment complies with the requirements of regulatory legal documents for all indicators (Table 1).

In the territory of Bozsu air station, waste water from more than 50 enterprises, such as various textile, tanning enterprises, car washes, fruit drying enterprises, and animal slaughterhouses, together with wastewater from the population, is discharged. Despite the fact that most of them have local treatment facilities, their efficiency cannot be considered satisfactory. As a result of inspections conducted in Chilanzor, Almazor, Shaikhontokhur, Uchtepa, Yunusobod districts of Tashkent city, which discharge their waste water into the sewage system coming to the Bozsu air station, it

was found that a number of textile, leather tanning, lacquer-paint, paper production enterprises operating in these districts do not clean the sewage system. disposes of waste water generated in its technological processes. This situation has a negative impact on the efficiency of the Bozsu air station equipment. As a result, there will be a negative change in the conditions for using this open water basin among the population living below the Bozsu air station and the incidence of water-related diseases among the population.

**Conclusion.** A sharp increase in water consumption in all sectors of the national economy causes an increase in the amount of household and enterprise waste water from year to year. 50% of the generated wastewater is discharged into open water bodies without passing through the necessary treatment steps. To improve the efficiency of wastewater treatment entering the territory of the aerostation, to ensure that the indicators of wastewater treatment in every enterprise connected to the sewage system for the protection of water bodies, where wastewater is generated in the general technological process, are treated in accordance with the requirements of the decision of the Cabinet of Ministers dated October 11, 2018, and for this, of course, local it is necessary to install cleaning devices and regularly monitor their effective operation.

**References:**

1.Decision of the President of the Republic of Uzbekistan No. PQ-3286 "On measures to further improve the system of protection of water bodies" - Tashkent, 2017.
2. Regulation of the Cabinet of Ministers of the Republic of Uzbekistan No. 981 "On the procedure for determining water protection and sanitary protection zones of water bodies in the territory of the Republic of Uzbekistan". - Tashkent, 2019.
3. Decision of the President of the Republic of Uzbekistan No. PQ-5005 "On approval of the strategy of water resources management and development of the irrigation sector of the Republic of Uzbekistan for 2021-2023". - Tashkent, 2021.
4. Kovalchuk V.A. Water treatment - Rivne: VAT "Rivnenska drukarnya", 2018. - 622 p.
5. Sobgaida N.A., Olshanskaya L.N., Makarova Yu.A. Filtry iz otkhodov dlya ochistki stochnykh vod // Ekologiya proizvodstva. - 2016. - No. 3. - S. 68-71.
6. Sobgaida N.A. Methodology ochistki stochnykh vod khimicheskikh i neftekhimicheskikh otrasley promyshlennosti fitosorbentami i modifitsirovannymi otkhodami agropromyshlennogo komplexa: diss. … Dr. tech. science - Kazan, 2011. - 304 p.
7. Khamidova H.M. Development of microbiology and microbial biotechnology // Materialy Mejdunarodnogo symposium "Microorganisms and biosphere". - Tashkent, 2015. - S. 3-9.