



## CAR WASHES AS A SOURCE OF ENVIRONMENTAL POLLUTION

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### Abstract

Environmental pollution is the main problem of urban ecology. One of the biggest sources of pollution of the natural environment is automobile transport. The development of effective systems for the treatment of waste water from car washes can reduce the man-made impact on the environment and protect the ecological environment of the city from various sources of pollution in the future. Car washes are widely used by the population. If all the requirements are not observed when using car washes, then they can have a harmful effect on environmental factors, first of all on water bodies.

**Keywords:** car wash, softener, grease trap, car, waste water, contact, non-contact.

### Аннотация

Загрязнение окружающей среды является одной из основных проблем экологии города. Одним из мощных источников загрязнения природной среды является автомобильный транспорт. Разработка эффективной системы очистки сточных вод автомойки позволит снизить техногенное воздействие на окружающую среду и может защитить экологическую среду города от дальнейших загрязнений. Автомоечные станции пользуются широким спросом у автолюбителей. Если не соблюдать все установленные требования к моечным станциям, то они могут оказать существенное негативное воздействие на окружающую природную среду.

**Ключевые слова:** автомойка, отстойник, жируловитель, автомобиль, сточные воды, контактный, бесконтактный.

### Introduction

"National report on the state of the environment and the use of natural resources in the Republic of Uzbekistan -2008" According to the report, there are more than 17,000 natural watercourses in Uzbekistan, and the main 80% of them are the Amudarya and Syrdarya basins. Their annual average flow is 116.8 km<sup>3</sup>. In





particular, 78 km<sup>3</sup> of water will be produced in the Amudarya basin and 38.8 km<sup>3</sup> in the Syrdarya basin. Uzbekistan's water resources make up only a part of the total water resources of the Arol Sea basin.

In Central Asian countries, especially in Uzbekistan, in 1990, 4,500 m<sup>3</sup> of water was available per person, but by 2017, this figure has halved, that is, now 2,100 m<sup>3</sup> of water per person is available. The total volume of available water resources in Uzbekistan is equal to 51 billion m<sup>3</sup>, the main part of which is used for agriculture. The share of this sector in water consumption is equal to 92%. The next place in terms of water consumption is the communal-household sector, its share is equal to 5.5%, fisheries - 1.8%, energy - 0.2% (expert of the Central Asian Interstate Coordinating Commission on Water Management N. Mirzaeva, Ecology Bulletin No. 3 of 2017, pp. 3-6).

Year by year, the problem of providing the population with high-quality drinking water is increasing, and there is a tendency to increase the relative burden of throwing untreated or poorly treated wastewater into water bodies. For this reason, the number of outbreaks of water-related infectious diseases has increased in a number of regions [1, 2].

In the conditions of shortage of clean water, urban waste water can be a source of water supply for industrial enterprises for various technological processes. Naturally, such waste water must be cleaned before being supplied to production networks, and its depth and description are determined by both technological and hygienic requirements [3, 4].

In the analyzes carried out by the Uzgidromet organization, the amount of pollutants in the Chirchik River (petroleum products, EKBBE (biochemical demand for dissolved oxygen), phosphates, iron), in the Karasu canal (ammonium nitrogen, nitrogen nitrite, phosphates, iron), in the Bozsu canal (ammonium nitrogen, phosphates, chlorides, oil products), in the Salar canal (sulfates, phosphates, iron, ammonium nitrogen) higher than the sanitary-hygienic norms were noted.

One of the main sources of water pollution is the car wash. The technological analysis of the car washing process made it possible to determine the average amount of water used for washing 1 car per year in social surveys conducted among car owners, according to calculations, the water used for washing light cars in the city of Tashkent is 4.34 million m<sup>3</sup>, and unfortunately they are at the necessary level not cleaned. 734 kg of suspended solids, 446 kg of oil products and 127 grams of surfactants (surfactants) per year are discharged from one car wash into the sewage system. When these substances enter the city sewage network, they disrupt the biological treatment process [5, 6, 7, 8].





## Materials and Methods

Generally accepted sanitary-hygienic, questionnaire, technical-technological, visual, chemical inspection methods were used in conducting the research work.

## Results

Currently, more than 225 car wash branches are operating in Tashkent city. In 1 year, one fountain uses 10621.5 m<sup>3</sup> of fresh water. The resulting waste water is mostly left untreated or only passed through clarifiers and discharged into the sewage system without necessary treatment. Water consumption for light cars in officially registered car washes in Tashkent is 1.33 million m<sup>3</sup>. If we take into account the consumption of 200 liters of water for 1 wash of the number of cars in Tashkent (417,646 according to official statistics) and washing the car once a week, the number of 4.34 million m<sup>3</sup> will be obtained. This does not include trucks, buses and special vehicles.

Existing car washes in Tashkent operate in contact and non-contact mode. We selected 2 (1 contact, 1 non-contact) tea shops located in Almazor and Yunusabad districts of Tashkent city as control objects. Water consumption in these stations depends on the type of car wash and the type of equipment in the station.

Granuloma of suspended substances formed in the washing of light vehicles Etric composition is as follows:

- 300-2500 micron particles 12%
- 100-300 μm particles 75%
- 13% smaller than 199 μm

Solvent additives, oil residues, and suspended solids are the main components of wastewater generated in car washes. 100 liters of waste water produced in this case contains the following substances, kg: dry residue - 76, chlorides - 17, sulfates - 4, suspended substances - 1. Also, the resulting wastewater contains petroleum products and heavy metal salts.

In the car wash shop operating in Almazor district, manual contact washing is carried out, that is, the cars are first thoroughly washed with detergents and towels, thoroughly washed with pressurized water, and finally the foam formed on the top of the car is washed off.

The non-contact method of washing cars in the Yunusabad car wash is used, that is, the car is first rinsed with high-pressure water, then the car is covered with a special chemical composition that dissolves the dirt on the car, and then after a few minutes, the car is washed again with high-pressure water. washed with



**Table 1. The formation of pollutants during car washing**

Vehicle	Cosmetic wash		Complex washing	
	Amount of contaminants in kg in 1 wash	Number of washes per year	Amount of contaminants in kg in 1 wash	Number of washes per year
A light car	0.7	40	1.5	15
Truck	1.4	85	3.1	10

Every day such stations serve 35-40 cars. The results of the inspection of these outlets showed that the volume of waste water produced by contact washing is higher than that of non-contact, but washing one car is almost twice as fast as non-contact. Therefore, it is desirable to organize local treatment facilities that allow recirculation water supply in car wash stations, to automate car washing as much as possible.

### Summary

Car washes are one of the necessary utility facilities for city dwellers who have a fleet of cars that is increasing in number and type every year. Therefore, when planning them in residential areas and timely and effective treatment of waste water, it is necessary to pay attention to the following: car washing devices in the town should be connected to the waste water treatment system; as part of waste water treatment devices, it is required to use oil, oil product retention devices, softeners, and foam suppressants. The temperature of the water in the car wash is normal. It works at +5°C, therefore, if the heater works continuously throughout the day, it is advisable to work only in heated sections. In addition, it is necessary to pay attention to the norms of water consumption, which is constantly used in the reservoir.

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