

The equation of non-isothermal moisture transfer which is built in the software package «SPS» was obtained using thermodynamic laws, moisture sorption isotherms, and two-phase filtration equations. Unlike the two-phase filtration equations in the modified equation for determining the dependence of the fluid pressure on the moisture content and temperature, there is no need to experimentally determine the Leverett function. In the proposed model, the equation of non-isothermal moisture transfer is obtained in the form, in which the intensity of mass transfer does not include explicitly. First, the intensity of mass exchange can not be determined experimentally. Secondly, it is a highly nonlinear function of moisture content and temperature, which has an order comparable to the values of flows. It often leads to the divergence of difference scheme in numerical solution.

In deriving the equation of non-isothermal moisture transfer that motion of fluid and water vapor occurs in the field of gravity. In enclosing structures it can be neglected.

In the work, one-dimensional model of non-isothermal moisture transfer for the enclosing construction of building is created.

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ANALYSIS OF TECHNOLOGICAL CONSUMPTION OF WATER IN THE MUNICIPAL WATER SUPPLY AND USE WASTE WATER TREATMENT BY THE EXAMPLE OF CITY GRODNO

E. Kruk, N. Lysuho

*Belarusian State University, ISEI BSU,
Minsk, Republic of Belarus
nlysukha@mail.ru*

Currently RUE "CRICUWR" (Central Research Institute for Complex Use of Water Resources) is a specialized state scientific-research organization in the sphere of integrated water resources management of the Ministry of natural resources and environmental protection of the Republic of Belarus. It was established in accordance to the resolution of the Council of Ministers of the USSR on April 22nd, 1960, № 425 "On measures on streamlining of use and increased protection of water resources of the USSR" and the decree of the Presidium of the Academy of Sciences of BSSR on February 14, 1961, No. 10.

A comprehensive assessment of the impact of housing and communal services has been conducted on the model of Grodno on the environment, regulation of water use (rationing of water use and sanitation, the development of scientifically based suggestions for the regulation of wastewater discharges), calculation of norms of process water in the municipal water supply, the calculations of the rate of losses and unaccounted for water from the municipal water supply, environmental and feasibility study comprehensive solution to the problem of surface runoff (rain and meltwater) with a built-up area of the settlement. Were considered the main legal acts and technical normative legal acts in the sphere of use and protection of waters, studied and systematized data in 2012–2013 and the prediction of water flow in the municipal water supply in 2014 on the model of the regional enterprise the necessary calculations have been made.

Keywords: environmental protection, water protection, integrated impact assessment.

Work in RUE "CRICUWR" was held at the Department of regulation impacts on the environment and was carried out in two main areas:

- gathering information about the legislation and methodological approaches to calculating technological losses of water in the municipal water supply;
- analysis of the use of waste water treatment in the Republic of Belarus.

Our main purpose was to calculate the norms of process water consumption based on data from 2012 to 2013 and prediction for 2014. The Main document on the basis of which the calculations were made is the decree of the Ministry of housing and communal services of the Republic of Belarus we from December 29, 2004 № 39 "On approval of the instruction on assessment and calculation of the standard technological losses of water in the municipal water supply of settlements of the Republic of Belarus".

This instruction establishes the structure, definition and assessment of technological water consumption for operators of municipal (city, town) drinking water supply systems of settlements of the Republic of Belarus, regulatory of the collection and processing of initial information in tabular form for assessment of technological water

consumption, contains a mechanism for such assessment and valuation on the basis of implementation of necessary measures to achieve quality standards of drinking water as well as recommendations for systematic gathering of information on the process of water consumption and frequency of review of the established standards. The results of the evaluation and regulation of technological expenditure of water are used to calculate the limits of water intake from water sources, issuing permits for special water use, development of measures on rational use and reduction of water losses.

The result of the calculations of the standard process of water flow in the municipal water supply of the city of Grodno in 2014 showed that the total amount of the technological costs amounted to approximately 2089 thousand m³, the volume of submitted network of water is equal to 29725 thousand m³, and the standard of technological losses of water in the system is about 7 % of the volume served in network water.

TECHNO-ECONOMIC ANALYSIS OF WASTE MANAGEMENT AT THE ENTERPRISES OF THE REPUBLIC OF BELARUS

A. Kuniza, C. Mukina

*Belarusian State University, ISEI BSU,
Minsk, Republic of Belarus
kunizaalesaj@mail.ru*

In this work the analysis of the data of the state waste cadastre, which is maintained according to the state statistical reporting 1-waste (Minprirody). The analysis allowed us to systematize the data, including quantitative and qualitative characteristics of wastes, the formation and movement of waste, including the use, treatment, storage, and disposal, to identify the dynamics of volumes of production waste, and develop activities aimed at the prevention or reduction of waste generation volumes.

Keywords: state waste cadastre, state statistical reporting form 1-waste (Minprirody), waste production.

Form 1-waste allows you to enter accounting of formation and movement of wastes at the enterprises carrying out activities associated with the circulation of waste in the Republic of Belarus. [1; 2]

According to the 2015 in the Republic of Belarus was formed about of 49,9 million tonnes of waste. Of the total amount are the most significant large-capacity waste: halite wastes and halite slimes clay-salt – approximately 33,7 million tons of phosphogypsum and – 660,1 thousand tons.

However, due to the increase in production of potash fertilizers the amount of halite wastes and halite slimes clay-salt increased compared with the previous year by 0,81 million tonnes (the waste in 2015 accounted for 68 % of the total mass of generated waste in Belarus). The level of use halite waste remains low and in 2015 amounted to only 2 %; halite slimes clay-salt were not used. In the dumps were taken about 29,85 million tons of halite wastes generated and their accumulation was 932,72 million tons, halite slimes, and the accumulation of halite slimes clay-salt – approximately 110,5 million t

Given the large-capacity waste in 2015 used 12164 tonnes of waste and use of waste products amounted to 24,4 %. Excluding large waste volume usage made in 2015 11452,12 kt, and the level of use of production waste was 74 %. Found that 54,5 % of the total quantity of waste used is used for needs of the enterprises themselves, and a 45,5 % transferred to other enterprises, implemented or exported for further use.

The volume of accumulated waste in storage facilities (in the departmental storage locations and facilities) increased for 2015. 3,4 % and amounted at the end of the year about 1094,2 million tons of the total volume formed in 2015, the number of buried waste amounted to 1278 thousand [3; 4]

Currently, the solution of problems of utilization and recycling is not only environmental, but also technological challenge. The properties of most waste do not allow with sufficient efficiency to return them in the sphere of production or safe disposal. In this regard, required the application of different methods of waste disposal. In 2015, Belarus neutralized 210 тыс. t waste production. The most used method is thermal decontamination (this method neutralized with 64,6 % of the total volume of neutralized waste 135,7 thousand tons).

It is established that in 2015 enterprises of the Republic of Belarus 805 made efforts to reduce the amounts of education and (or) accumulation of waste products, including:

- 153 measures to improve technological processes leading to a reduction of waste production;
- 146 – on creation of storage facilities, temporary storage of waste;
- 12 – for the construction, reconstruction, modernization of facilities for the use of waste;
- 6 – for the construction, reconstruction, modernization of facilities for the disposal of waste;
- 10 – for the construction, reconstruction, modernization of facilities for the disposal of waste;