

# Assessment of water resources in city Stryi of Lviv region

A. Hyvlyud<sup>1</sup>, V. Pohrebennyk<sup>2</sup>, R. Politylo<sup>3</sup>

1. Department of Ecological Safety and Nature Protection Activity, Lviv Polytechnic National University, UKRAINE, Lviv, S. Bandery Street 12, E-mail: anna.hyvlyud@gmail.com

2. Department of Ecological Safety and Nature Protection Activity, Lviv Polytechnic National University, UKRAINE, Lviv, S. Bandery Street 12, E-mail: vpohreb@gmail.com

3. Department of Ecological Safety and Nature Protection Activity, Lviv Polytechnic National University, UKRAINE, Lviv, S. Bandery Street 12, E-mail: polirom@gmail.com

**Abstract** – this paper is dedicated questions of assessment of water resources in city Stryi of Lviv region. Ecological and geographical characteristics of city Stryi in Lviv region were conducted. The analysis of water resources was executed. The determination of elemental composition in water samples was done in city Stryi of Lviv region. According to results of the research work, the assessment of the ecological state of water resources in city Stryi of Lviv region was done.

Keywords – analysis of the impact, water resources, pollution, ecological state, city Stryi.

## I. Introduction

At present, the ecological pollution problem is one of the most important problem. Water pollution from human activities increases every day. The interest in water resources issues and the prediction of their impact on the health of the population is increasing throughout the world. The problem of supplying humanity with water is global, and for its solution, cooperation and coordination of the activities of all international organizations and states is required [1].

The problem of water pollution is the main processes that cause degradation of rivers, reservoirs, lake systems and deterioration of water quality. Although the main cause of both processes is the waste of business activity. Pollution of reservoirs by toxic substances of man-made origin often complicates or makes it impossible to use water for drinking purposes.

Prospects for solving water pollution problems are the formation of effective legal, economic and organizational preconditions for rational water use, the introduction of water saving forms of management, the establishment of closed water cycles with minimal pollution of water, and the restoring functions of water bodies [2-3].

Currently, the problem of providing quality of water resources is actual for every populated point of Ukraine, in particular in the city Stryi of Lviv region.

## II. Results of the research work

**The aim of the work** is to assess the ecological state of water resources in the city Stryi of Lviv region using the results of the experimental research.

To achieve the goal, the following tasks are set:

- conducting ecological and geographical characteristics of the city Stryi;

- studying the ecological state of surface water in the city Stryi;
- conducting analysis and assessment of the ecological state of the investigated water objects in the city Stryi.

In this paper, a single sample of samples for assessment of the pollution from wells of two enterprises, wells of one of the households and the river Stryi was used.

The samples were sampled in the river Stryi within city Stryi in next places: 50 m above sewage treatment facilities, 500 m above sewage treatment facilities, 500 m below sewage treatment facilities, 100 m above the Stryi deposit of underground water.

The following indicators were studied: color, active reaction of pH, hardness, sulfates, chlorides, nitrites, nitrates, total iron, dry residue and others.

For each of the indicators for drinking water, the maximum allowable concentration (MPC) has been set in accordance with State standards of norms and rules "Hygienic requirements for drinking water intended for human consumption" (SSNR 2.2.4-400-10). For each of the indicators for river water, the maximum allowable concentration (MPC) has been set in accordance with «Sanitary rules and norms of protection surface water from pollution» (SRN 4630-88).

All results of the analysis are presented in the following tables.

TABLE 1

CONCENTRATION OF POLLUTANTS IN WATER OF THE STATE ENTERPRISE "STRYYSKY KOMBINAT KHLIBOPRODUKTIV NO. 1", STRYI, ST. GRABOVETSKAYA, 2

Indicator	MPC	Results of the analysis
Color	-	without color
Active reaction of pH, pH	6,5-8,5	6,6
Hardness (mg-equiv/dm <sup>3</sup> )	7,0(10)	6,9
Sulfates (mg/dm <sup>3</sup> )	500	40,0
Chlorides (mg/dm <sup>3</sup> )	350	30,0
Nitrites (mg/dm <sup>3</sup> )	3,3	0,003
Nitrates (mg/dm <sup>3</sup> )	50,0	22,5
Total iron (mg/dm <sup>3</sup> )	1,0	0,09
Dry residue (mg/dm <sup>3</sup> )	1000,0	280,0

TABLE 2

CONCENTRATION OF POLLUTANTS IN WATER OF LLC "BUDPROMVIR", STRYI

Indicator	MPC	Results of the analysis
1	2	3
Color	-	without color
Active reaction of pH, pH	6,5-8,5	6,6
Hardness (mg-equiv/dm <sup>3</sup> )	7,0(10)	6,9
Sulfates (mg/dm <sup>3</sup> )	500	39,0
Chlorides (mg/dm <sup>3</sup> )	350	30,0
Nitrites (mg/dm <sup>3</sup> )	3,3	0,006

CONTINUATION OF TABLE 2

1	2	3
Nitrates (mg/dm <sup>3</sup> )	50,0	22,5
Total iron (mg/dm <sup>3</sup> )	1,0	0,1
Dry residue (mg/dm <sup>3</sup> )	1000,0	290,0

TABLE 3

CONCENTRATION OF POLLUTANTS IN WATER OF STRYI, ST. YAVORNITSKY 28

Indicator	MPC	Results of the analysis
Color	-	without color
Active reaction of pH, pH	6,5-8,5	6,7
Hardness (mg-equiv / dm <sup>3</sup> )	7,0(10)	6,8
Sulfates (mg/dm <sup>3</sup> )	500	40,0
Chlorides (mg/dm <sup>3</sup> )	350	30,0
Nitrites (mg/dm <sup>3</sup> )	3,3	0,004
Nitrates (mg/dm <sup>3</sup> )	50,0	22,5
Total iron (mg/dm <sup>3</sup> )	1,0	0,1
Dry residue (mg/dm <sup>3</sup> )	1000,0	280,0

TABLE 4

CONCENTRATION OF POLLUTANTS IN RIVER WATER (STRYI RIVER, 50 M ABOVE THE SEWAGE TREATMENT PLANTS)

Indicator	MPC	Results of the analysis
Color	-	without color
active reaction of pH, pH	6,5-8,5	7,28
Sulfates (mg/dm <sup>3</sup> )	500	40,0
Chlorides (mg/dm <sup>3</sup> )	350	30,0
Ammonia nitrogen (mg / dm <sup>3</sup> )	2,0	0,045
Nitrites (mg/dm <sup>3</sup> )	3,3	0,004
Nitrates (mg/dm <sup>3</sup> )	50,0	18,00
Total iron (mg/dm <sup>3</sup> )	1,0	0,09
Dry residue (mg/dm <sup>3</sup> )	1000,0	440,0
Petroleum products (mg/dm <sup>3</sup> )	0,3	0,29
Chromium (6) (mg/dm <sup>3</sup> )	0,05	0,045
Cadmium (mg/dm <sup>3</sup> )	0,001	0,04
PAEs (mg/dm <sup>3</sup> )	0,5	0,02
Phenols (mg/dm <sup>3</sup> )	0,001	0,001

TABLE 5

CONCENTRATION OF POLLUTANTS IN RIVER WATER (STRYI RIVER, 500 M BELOW THE SEWAGE TREATMENT PLANTS)

Indicator	MPC	Results of the analysis
Color	-	without color
Active reaction of pH, pH	6,5-8,5	7,3
Sulfates (mg/dm <sup>3</sup> )	500	40,0
Chlorides (mg/dm <sup>3</sup> )	350	26,0
Ammonia nitrogen (mg / dm <sup>3</sup> )	2,0	0,05
Nitrites (mg/dm <sup>3</sup> )	3,3	0,003
Nitrates (mg/dm <sup>3</sup> )	50,0	28,0
Total iron (mg/dm <sup>3</sup> )	1,0	0,1
Dry residue (mg/dm <sup>3</sup> )	1000,0	280,0
Petroleum products (mg/dm <sup>3</sup> )	0,3	0,3
Chromium (6) (mg/dm <sup>3</sup> )	0,05	0,05
Cadmium (mg/dm <sup>3</sup> )	0,001	0,05
PAEs (mg/dm <sup>3</sup> )	0,5	0,02
Phenols (mg/dm <sup>3</sup> )	0,001	0,001

## Conclusion

After conducting the analysis of water from wells in the city Stryi, we can say that only the active reaction of pH in one sample exceeds the value of MPC in 0.1 times, which does not significantly affect the total concentration of pollutants in water. Other indicators such as hardness, sulfates, chlorides, nitrates, total iron and dry residue are within acceptable limits and do not exceed the value of the MPC for drinking water in accordance with SSNR 2.2.4-400-10.

Concerning of river water, the ecological state of the river Stryi is within acceptable norms. After conducting series of tests it was determined that the river water meets the standard indicators MPC according to SRN 4630-88 for river water within the settlement.

## References

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