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ANALYSIS OF THE PROBLEMS IN GROUNDWATER EXTRACTION MANAGEMENT DUE TO CHANGES IN THE LAW “ABOUT MINERAL RESOURCES”

Summary. Water is a key component of our environment; it is renewable, limited and vulnerable natural resource, which provides economic, social, and environmental well-being of the population. The most promising source of drinking water supply is groundwater usage. Drinking and industrial groundwater is one of the most important components of the groundwater mineral resource base in the Russian Federation. According to official statistics, the share of groundwater use in overall balance of drinking water supply is 53-55%. The modern system of groundwater extraction management is currently imperfect and has definite disadvantages, among them - lack of control over natural resources by the state, an old system of tax rates for the use of groundwater, the commercialization stage of licensing, the budget deficit, which is passed on the other spheres of the national economy. This article provides general information about the state of groundwater production and supply in Russia, negative trends of groundwater usage, some actions for the improvement in the system of groundwater's fund management are suggested. The most important amendments of the law “About mineral resources” are overviewed, effects of these changes are revealed and recommendations for future groundwater extraction regulation are given.

Keywords: groundwater, natural resource, groundwater extraction management, license, low debit intake, taxation of groundwater extraction.

ANALIZA PROBLEMÓW ZARZĄDZANIA POZYSKIWANIEM WÓD PODZIEMNYCH, SPOWODOWANYCH ZMIANAMI W PRAWIE „O SUROWCACH MINERALNYCH”

Streszczenie. Woda jest kluczowym elementem naszego środowiska, jest odnawialnym, ograniczonym i wrażliwym surowcem naturalnym, który zapewnia

ekonomiczny, socjalny i środowiskowy dobrobyt populacji. Najbardziej obiecującym źródłem wody pitnej są wody podziemne. Podziemne wody pitne i przemysłowe są jednym z najważniejszych komponentów bazy kopalnianych surowców mineralnych w Federacji Rosyjskiej. Zgodnie z oficjalnymi statystykami, udział wód podziemnych w całkowitym bilansie dostarczanej wody pitnej wynosi 53-55%. Nowoczesny system zarządzania pozyskiwaniem wód ziemnych jest nieperfekcyjny i ma pewne wady, np. brak kontroli rządu nad surowcami naturalnymi, nieaktualny system stawek podatkowych za używanie wód podziemnych, komercjalizacja licencji, deficyt budżetowy, który dociera do innych sfer krajowej gospodarki. W artykule przedstawiono ogólne informacje na temat kondycji pozyskiwania i dostarczania wód podziemnych w Rosji czy negatywnych trendów w ich użytkowaniu, a także sugestie w zakresie ulepszenia systemu gospodarowania nimi. Opisano najważniejsze zmiany w prawie „O surowcach mineralnych”, ukazano efekty tych zmian oraz przedstawiono rekomendacje w celu uregulowania pozyskiwania wód podziemnych w przyszłości.

Słowa kluczowe: wody podziemne, zasoby naturalne, zarządzanie zasobami wód podziemnych, licencja, opodatkowanie wydobywania wód podziemnych.

1. Introduction

Water is the most important resource and is the essential condition of life for a human being as well as a component of any production activity. Russia possesses more than 20% of global reserves of fresh water which makes it one of the richest countries of the world from this point of view. In the long term prospective Russia is to play a special role in solution of problems of rational water management not only on its own territory but on the international arena as well. Thus, water is a strategic resource of the Russian Federation.

Being a more reliable source of water supply than the surface waters the underground waters play a significant role in solution of water supply problems¹. First of all, underground waters present a very specific kind of mineral resources. One of the important factors that distinguish the underground waters from the other kinds of mineral resources stands for dynamic nature of reserves and resources, lower dependence of their quality on natural and anthropogenic factors, methods and volumes of production². Unlike the other kinds of mineral resources, the reserves of underground waters are renewable in the process of operation.

Underground waters are produced with the help of water intake structures which include various types of water supply wells, shafts, drainage facilities, capping springs. Each underground water intake is a complicated engineering structure construction, which requires special profile preparation.

¹ Borevskiy B.V., Yazvin L.S., Pugach S.L.: Underground water: the state of provision of potable and technical water. Mineral resources in Russia. Economics and management, No. 4, 2008.

² Internet resources: www.mineral.ru.

At the time being the Central, Volga and Siberia Federal Areas produce most of underground water in the Russian Federation. Far East Federal Area produces the least amount of underground water. Moscow region, Krasnodar Area, Kemerovo and Sverdlovsk regions are the leading producers of underground water. The extent of mastering of reserves (relation of production of underground waters to their reserves) in Russia remains on the level of 33%.

The main resources base of all the types of underground waters (fresh water, technical, mineral, thermal and industrial ones) was created due to large scale geological surveys performed for state budgetary assets before the beginning of 1990s. On average nowadays 82% of all the amount of produced underground waters is consumed and up to 18% of produced water is dumped without usage. The structure of usage of underground waters as of today remains almost without any changes: about 76% of water goes to utility and drinking water supply and 22% of produced water is spent for industrial and technical purposes.

At the time being more than half of deposits of underground waters are still not developed and remain in the non-distributed subsoil reserves fund. Most of them require re-evaluation and cannot be developed at all due to the changed economic and ecological situation (remoteness from the consumer, degree of development of the deposit territory, pollution of underground waters, non-steady chemical analysis etc.) and higher requirements to water quality.

More up-to-date provision of territory of Russia with known reserves is shown below on the map which excludes from the total amount of reserves the deposits which are most likely not to be developed at all (figure 1).

Predicted reserves of drinking and technical groundwater of the Russian Federation are very large; they are estimated at 869.1 million m³ / day.

The main methods of groundwater extraction management are modern system of groundwater licensing and system of groundwater production taxation. Analysis of the current state of groundwater usage has shown that in the new socio-economic conditions, effectiveness of the research greatly depends not only on the degree of the hydrogeological conditions knowledge, but also on their compliance with the requirements of the regulatory framework results. Groundwater extraction management should be based on a systematic approach that takes into account all aspects of groundwater use, starting with the proper legislative support, state regulation of its production.

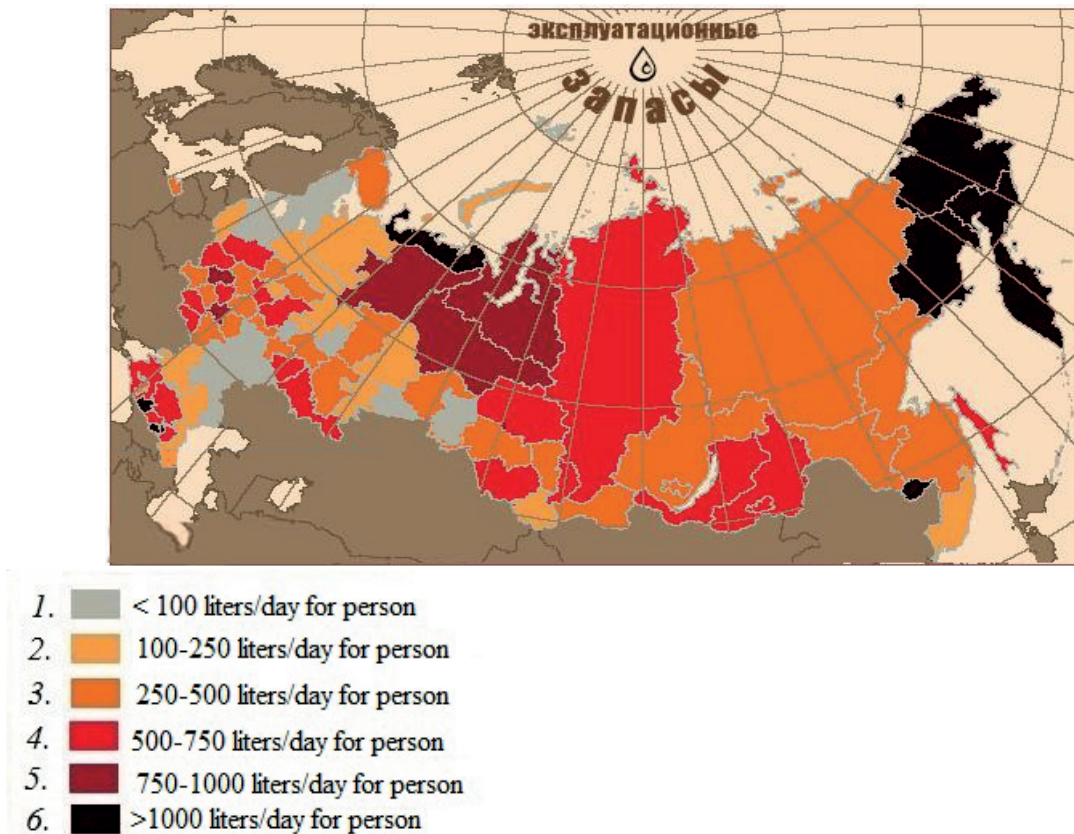


Fig. 1. Provision of population of Russia with reserves of potable underground waters from deposits of the distributed and partly non-distributed fund, liters/day for one person

Rys. 1. Zapasy podziemnej wody pitnej w Rosji z zasobów eksploatowanych lub częściowo nieeksploatowanych w przeliczeniu na litr/dzień na mieszkańca

Source: Groundwater extraction statistics [Electronic resource]. Access mode: <http://www.mineral.ru>.

2. Regulation of groundwater extraction

Legal management of groundwater extraction features double regulation to some extent. On the one part, one can mention norms of Russian Law No. 2395-1 “About mineral resources” as of 21.02.1992. On the other part there are norms of water legislation (Water Code of Russia No. 74-FZ as of 03.06.2006, which became valid on 01.01.2007). Besides the fact that both legal documents require updating, it is necessary to correctly separate and interrelate these two regulatory documents. At this moment there is legal lacuna, in particular in terms of taxation of utilization of underground water objects.

The main document which regulates taxation of water objects is presented by the Tax Code of the Russian Federation, chapter 25.2 “Water tax” (introduced by Federal Law No. 83-FZ as of 28.07.2004).

In accordance with the Law of the Russian Federation “About mineral resources”, geological survey and production of underground waters is realized on the basis of provided

right to use the area of subsoil reserves which is executed by state permit in the form of a license³. Production of appraised underground waters from the water-bearing levels by individual users is prohibited by law, which is totally wrong as it presents violation of constitutional provisions and results in forced violation of law.

On January 1, 2015 important changes in the law “About mineral resources” are introduced. All the amendments have a significant impact on the groundwater management system at the moment.

The first significant change in the law of the Russian Federation “About mineral resources” is a classification of subsoil areas containing groundwater used for drinking and household water supply or for water supply in industrial and agricultural purposes and whose volume of production is less than 500 cubic meters per day. Now they are lead to areas of local authorities. Thus, now groundwater intakes, which are mined in excess of more than 500 m³ per day are administered at the federal level, and the areas with production of up to 500 m³ per day are moved to the level of the Russian Federation subjects.

Another substantial change in the same law is connected with the cancellation of the reserves estimation in areas with output of up to 100 cubic meters per day. As a result, the state exempts from passing the examination of the groundwater resources of the users and thus does not bear responsibility for possible inconsistency of the quality of groundwater intakes and loses control over this mineral wealth.

3. Lacks of the groundwater extraction management

The current structure of groundwater resources management in Russia is complex and "formless". Such issues as structuring of the management authorities, including clear delineation of roles, rights and responsibilities in organizations, as well as the division of competences among them; preparation of the legislative framework; development and implementation of economic mechanisms and methods in economic stimulation of rational groundwater usage should be solved in the course of water management restructuring⁴.

The main deficiencies of the modern system of groundwater extraction control are presented by such factors as:

- 1) insufficient and not always true reporting of producing companies in front of the licensing bodies and monitoring services. This manifests itself in absence of systems

³ The law of the Russian Federation “About mineral resources”, 21.02.1992 N 2395-1.

⁴ Golovina E.I.: Topical issues in the system of management of underground waters production on the territory of the Russian Federation, [in:] Golovina E.I.: European Science and Technology. Materials of the 4th International research and practice conference, Vol. 1, Munich, Germany 2013, p. 561-564.

for measuring levels of water in the wells and lack of information on change of chemical composition of underground water, etc.;

- 2) absence and low precision of operation of measuring equipment which results in lower indications during production of water;
- 3) shortage and sometimes even absence of the system of surveillance wells which does not make it possible to perform surveys and analysis of drawdown of underground water reserves (due to the absence of financing);
- 4) availability of large number of old deserted water intake facilities and creation of a whole network of private water intakes that can't be controlled and accounted for (Complicated and expensive procedure of licensing of water intakes results in massive license-free subsoil use);
- 5) absence and violation of sanitary protection zones of the acting water intake facilities which resulted from abrupt increase of price for land within the recent 10 to 15 years;
- 6) low rate of water tax which does not stimulate rational use of underground waters. For instance, very precious by their type potable underground waters can be extensively used for technical and technological needs;
- 7) total prohibition for production of potable underground waters by private entities for their own needs (in case of no possibility to connect to the system of centralized water supply due to remoteness of objects) which results in construction of individual water intake facilities without any permits. This trend is also defined by massive construction of individual houses and settlements on the former agricultural fields and in forest lands.

Thus, the overall picture of the volumes of production of underground waters in the whole regions becomes very unclear and inaccurate.

The law "About mineral resources" allows water intake without a license from the first from the surface water bearing level which is not a source of central water supply but this criterion can be evaluated only by specialist hydrogeologist.

- 8) attraction of private capital in the form of investment programs⁵ to the sector of water supply for the population which will result in higher rates for water supply but will not resolve the problem of reasonable water use on the scale of the whole regions as operation of any water intake well impacts work of neighboring water intakes, and vice versa.

Any changes in the system of state regulation of groundwater fund in Russia are impossible without improving the economic aspects of groundwater use, namely pricing and taxation system of groundwater extraction. Current imperfect taxation system objectively counteracts the intensive reproduction of mineral resource base, integrated and rational use of groundwater. Finally, the collection of groundwater tax does not provide even the current

⁵ Federal target program "Development of water management complex of the Russian Federation in 2012 - 2020".

expenses of the state for monitoring and exploration. Therefore it is necessary to propose a new system of taxation, which depends on various parameters. Collection of groundwater tax should provide a self sufficiency for groundwater extraction branch and bring it from the category of the subsidized sectors in the national economy.

4. Offered measures

State system of regulation of production and consumption of underground waters for various domestic purposes requires immediate reform and total reconsideration for some positions. First of all, the water as a mineral resource must be considered as state property belonging to the whole nation. And, consequently, production of underground water, distribution of funds by regions, target assignment, etc. must be performed under control of state specialized organizations and tax bodies and with restructuring of underlying laws (the law "About mineral resources", Water Code).

Main aspects of reform may be reduced to the following items:

1) it is necessary to reconsider basic taxation legislation (taxes for water) in the part of evaluation of price characteristics of underground water as mineral resource.

Nowadays the water tax rate is rather negligible (9 kopecks for 1 m³ of water) and does not depend on the quality of water itself and on its amount (target use, except for separate kinds of healthcare and recreation use). Low tax rate does not allow forming the budget for financing water intakes operation control systems, there is not enough assets for performance of planned and perspective geological survey works, large scale ecological and monitoring programs.

Alongside with that, low tax rate for production of underground water forms attitude to such a deficit mineral resource as to some almost free inexhaustible raw material.

Calculation of new tax rates is a complicated and multifactor task which requires profound economic analysis. But the main issue remains to be the price of underground water which is defined by the following factors:

- quality of water (availability of useful and detrimental microcomponents),
- amount of reserves,
- target use,
- market price,
- social components,
- possibility of sales on domestic markets,
- remoteness of deposit from the consumer,
- difficulty of production (net cost),
- hydrogeological factors (peculiarities).

2) underground water production and survey licensing system is based on the principle of registration and permission. The list of licensing requirements includes the whole package of projects, reports, approvals. Requirements for licensing (though clear and specific) are not simple for execution. In some case it takes years to get a license for production of underground water.

It would be reasonable to organize a united body of state registration (licensing) which would perform the functions of the "customer" that is production of regulation works as per requirements of the license on the principles of involvement of tender contractor specialized organizations. Thus, control over licensed works will be simplified and the price of the package of license documents will be financed.

3) the most important factor of field reforming stands for the need of registration, licensing and tax registration of all the single and group groundwater intakes. Such intakes include low debit wells, shafts, capping springs. Each of such objects must receive geological and ecological passport and must be licensed in accordance with the simplified program. Reporting system must be implemented for each of the intakes.

Involvement of this segment of subsoil reserves users in the united data base will make it possible to obtain priceless hydrogeological and ecological information and, on the other part, will refill the field budget via the taxation system. Financing of geological survey field at the expenses of consumers will make it possible to increase the level of survey of new deposits of underground waters, to maintain already developed water sources, to perform reevaluation of reserves and improve ecological component.

The problem of groundwater resources development is not only connected with the subjects of the Russian Federation, it also has respect to the border states. The proposed measures require international expertise and deep economic analysis.

5. Conclusion

Since Russia has rich resources of fresh underground waters, one of the major practical problems in their fund managing is a rational use of its resources and protection of aquifers from contamination and depletion. Economic instruments in the structure of state groundwater extraction management are the system of taxation, system of licensing, state regulation and control over groundwater production. Legal regulation of groundwater extraction is very important not only for current situation, but also for future actions.

It is worth noting that the legislative reform requires large-scale adjustments. The consequence of the amendments is inevitably a budget shortfall of tax revenues, license fees, respectively, the federal target programs will be reduced. There are many constructive suggestions from the leading Russian experts in the field of groundwater extraction in the area

of state administration and regulation, but so far they have not found its realization in the new legislation. In this connection, it is expedient to create a wide expert group of specialists in the field of the national economy to solve the problems in structuring groundwater management in Russia.

Bibliography

1. Borevskiy B.V., Yazvin L.S., Pugach S.L.: Underground water: the state of provision of potable and technical water. Mineral resources in Russia. Economics and management, No. 4, 2008.
2. Borevskiy B.V., Yazvin A.L., Charepansky M.M.: Expert assessments of the resource potential of groundwater in the development of schemes at complex use and protection of water resources. Exploration and conservation of mineral resources, No. 5, 2014.
3. Shen D.: Groundwater management in China. Water policy, No. 17, 2015.
4. Federal target program "Development of water management complex of the Russian Federation in 2012 - 2020".
5. Golovina E.I.: Economic mechanism of rational groundwater usage. Proceedings of the Samara Scientific Center of the Russian Academy of Sciences, Vol. 16, No. 1 (4), 2014.
6. Golovina E.I.: Topical issues in the system of management of underground waters production on the territory of the Russian Federation, [in:] Golovina E.I.: European Science and Technology. Materials of the 4th International research and practice conference, Vol. 1, Munich, Germany 2013.
7. Groundwater [Electronic resource]. Access mode: http://www.mineral.ru/Facts/russia/161/540/3_26_water.pdf.
8. Groundwater extraction statistics [Electronic resource]. Access mode: <http://www.mineral.ru>.
9. Mukhina E.M.: Legal regulation of groundwater use and protection: Abstract. Phd thesis, 2011.
10. Elvan O.D., Turker Y.O.: Analysis of Turkish groundwater legislation and policy regarding international principles and conventions. Water Science and Technology, No. 69/10, 2014.
11. The law of the Russian Federation About mineral resources, 21.02.1992 N 2395-1.
12. Water code of the Russian Federation 03.06.2006 N 74-FL (from 01.01.2007).
13. Yazvin L.S.: Evaluation of probable resources of underground drinking water and provision of the Russian population in groundwater for domestic, drinking water supply. Exploration and protection of mineral resources, No. 10, 2003.

14. Yazvin A.L.: Scientific substantiation of information support system of geological exploration resource potential fresh groundwater: Abstract. Dis. Doctor. geol.-min. science, 2015.

Omówienie

Rosja ma bogate zasoby podziemnych wód słodkich i jednym z głównych celów praktycznych zarządzania w tym zakresie jest racjonalnie ich użytkowanie oraz ochrona akwenuów przed zanieczyszczeniem i wyczerpaniem. W artykule przedstawiono ogólne informacje na temat kondycji gospodarki wodami podziemnymi i ich dostarczania w Rosji.

Instrumenty ekonomiczne zarządzania pozyskiwaniem wód podziemnych składają się z systemu licencjonowania i systemu stawek podatkowych. Obecnie oba te systemy nie są doskonałe. W artykule opisano negatywne trendy w zakresie użytkowania wód podziemnych oraz zasugerowano działania na rzecz ulepszenia systemu finansowania gospodarki wodami podziemnymi.

W 2015 roku nastąpiły znaczące zmiany w rosyjskim prawie dotyczącym regulacji gospodarki wodnej. Niestety nie przynoszą one żadnych ulepszeń w zarządzaniu wydobywaniem wód podziemnych. Z tego powodu opisano najważniejsze zmiany w prawie „O surowcach mineralnych”, ukazano efekty tych zmian oraz przedstawiono rekomendacje w celu uregulowania pozyskiwania wód podziemnych w przyszłości.