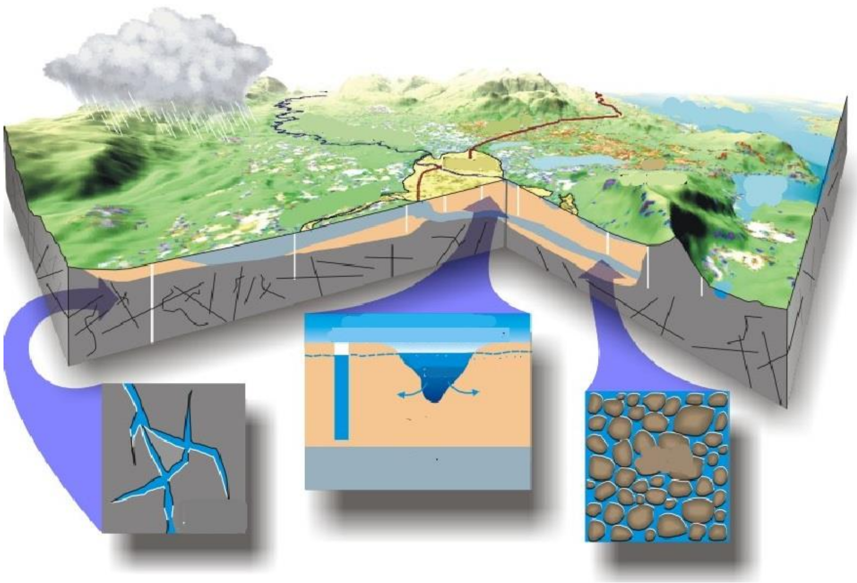
МИНИСТЕРСТВО ВЫСШЕГО ОБРАЗОВАНИЯ, НАУКИ И ИННОВАЦИЙ РЕСПУБЛИКИ УЗБЕКИСТАН

КАРШИНСКИЙ ИНЖЕНЕРНО – ЭКОНОМИЧЕСКИЙ ИНСТИТУТ

«БУДУЩЕЕ ГИДРОГЕОЛОГИИ: СОВРЕМЕННЫЕ ТЕНДЕНЦИИ И ПЕРСПЕКТИВЫ»

СБОРНИК МАТЕРИАЛОВ МЕЖДУНАРОДНОЙ НАУЧНО-ПРАКТИЧЕСКОЙ КОНФЕРЕНЦИИ



Карши-2024

“Gidrogeologiyaning kelajagi: hozirgi tendensiyalar va istiqbollar” mavzusidagi Xalqaro miqyosida ilmiy-amaliy maqollalar va tezislar to‘plami- Qarshi “Intellekt” nashriyoti, 2024-yil – 422 bet.

Xalqaro ilmiy-texnik anjuman sohaning yetuk olimlari, respublikamiz hamda xorijiy OTM professor-o‘qituvchilar, ilmiy-tekshirish instituti ilmiy xodimlari, yosh olimlar, talaba va magistrantlar, ishlab chiqarish korxonalarining yetakchi muhandislari, gidrogeologiyaning zamonaviy fandagi o‘rni, texnogenezning gidrogeoekologiyasi va gidrogeoekologik muammolari, foydali qazilma konlarini izlash va qidirishda innovatsion texnologiyalarni yaratish, mineral xom-ashyo va sanoat chiqindilarini qayta ishlash muammolari, geologiya-qidiruv ishlarida geodeziya va kartografiya muammolari va ularning yechimini topishga qaratilgan kompleks ilmiy-amaliy masalalarni muhokama etish orqali tadqiqotchilar uchun ilmiy manbani shakllantirish maqsadida tashkil etilgan.

В международной научно-технической конференции примут участие передовые ученые отрасли, преподаватели нашей республики и зарубежных вузов, научные сотрудники научно-исследовательских институтов, молодые ученые, студенты и магистранты, ведущие инженеры созданных по заказу производственных предприятий создать научный ресурс для исследователей путем обсуждения сложных научно-практических вопросов, направленных на создание инновационных технологий при поиске и разведке месторождений, проблем переработки минерального сырья и промышленных отходов, проблем геодезии и картографии в геологоразведочных работах и поиска их решений.

The international scientific and technical conference will be attended by advanced scientists of the field, professors of our republic and foreign HEIs, scientific staff of scientific and research institutes, young scientists, students and master's students, leading engineers of production enterprises. was established in order to create a scientific resource for researchers by discussing complex scientific and practical issues aimed at creating innovative technologies in the search and exploration of mines, problems of processing mineral raw materials and industrial waste, problems of geodesy and cartography in geological exploration and finding their solutions.

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To‘plamga kiritilgan materiallardagi ma’lumotlar va fikrlarning to‘g‘riligi uchun mualliflar javobgardir

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DETERMINING THE CHARACTERISTICS OF UNDERGROUND RIDGES IN A CONSTANT FLOW OF GROUNDWATER CHANNELS

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Abstract. *In solving the problems associated with the design and operation of large canals with many subsurface channels, it is important to determine the parameters of the parameters of the grids moving under the bottom and the flow rates. To date, a large number of field and laboratory research data on the movement of groups in the world have been obtained. Attempts have been made by some authors to summarize this information, but so far they have not been able to obtain perfectly reliable results. Therefore, new suggestions are being made by researchers to improve the formulas previously obtained.*

Keywords: *Issue, analysis, ridge, stream, waves, channel, design.*

Introduction. When solving problems related to the design and operation of large canals with many subsurface channels, it is important to determine the parameters of the parameters of the grids moving under their bottom and the flow rates [1, 2, 3]. One of the methods of determining the consumption of subsurface sediments is a method of determining the parameters of subsurface ridges, ie, taking into account the height, length, velocity and cycles.

An analysis of the available literature on the transport of sediments in the conditions of stream processes [3, 4] shows that this problem is one of the main problems of hydraulics of open rivers. We know that the movement of the primitive vertebrae takes place mainly in the form of gryads. The height and velocity of the ridges are determined by the flow resistance and depth deformations of the channel. The motion of the particles remains outside the scope of the matter, which is considered as separate particles. Although the formulas used to determine the flow rate are derived at this point, however, in practice no one disputes the crucial role of the movement and reshaping of the grids in the flow rate, deformation of the streams, and hydraulic resistance. Therefore, having theoretical and empirical formulas that link gryad parameters with the basic hydraulic characteristics of the flow is one of the key issues in this direction. It is known that the formulas obtained among the first ones somehow answer this question and were obtained many years ago [3, 4, 5]. Over time, new formulas and new theoretical developments emerge. This is because the practical application of both theoretical and empirical formulas designed to calculate gray parameters depending on the properties of the flow and leachate particles will be less effective. Currently, a large number of field and laboratory research data on the movement of groups in the world have been obtained. Attempts have been made by some authors to summarize this information, but so far they have not been able to obtain perfectly reliable results. Therefore, new suggestions are being made by researchers to improve the formulas previously obtained. But they are not giving effective results in essence. However, much scientific work has been done, but so far no solution has been found.

In this section, the process of formation of gryads under the influence of a steady flow of the gutter and the determination of the size of these gryads are discussed.

To this end, experiments were conducted in the laboratory of the Karshi Engineering-Economics Institute to study the process of formation of grids under conditions of steady flow in the core of the channel model, and the obtained research data were included in Table I.2 of the application.

As a result of the outflow of water from the groundwater basin, the formation of ridges and rifles under the bottom occurs. The process of formation of this peculiar ridges relief is associated with the turbulent structure of the water flow and the transport of the effluents.

Subcutaneous grids come in a variety of shapes depending on their structure. The appearance of the grids depends on the flow velocity, the depth of the flow, and the composition of the streams in the stream. The fine and homogeneous fissures of the active layer of the ozan form small and smooth grids at low velocities. The tops of the grids in this view are located almost vertically in the direction of flow. If the effect of velocities and waves becomes more pronounced, then rifles of larger size will begin to appear (Appendix,).

The experiments we performed in the laboratory were carried out at low velocities and waves, and the dimensions of the grids were obtained (see Table 3 on page).

We analyze the experiments conducted under stable conditions. A change in the composition of the subsurface and suspended sediments was observed with changes in the velocity of water movement. As the velocity of the water flow in the canal model decreases, the sedimentation of the suspended sediments occurs. In this case, the relatively large size of the suspended streams cannot hold themselves in a suspended position due to the small vertical flow velocities and fall to the bottom.

As noted by a number of researchers [6, 7], the main indicator of grid movements is their height. As mentioned above, among the existing methods of calculating the parameters of gryads, we use it because the link proposed by V.F. Pushkarev is formed from a large number of laboratory and field experimental data. It looks like this:

$$h_g = 0,00445\frac{\upsilon_0^2}{gd_0}h_0 + 0,049h_0, \qquad (1)$$

here h_0 - flow depth; υ_0 - average speed; d_0 - the average diameter of the fissures.

V.F Pushkarev used sand with a diameter of $d_0 = 0,50$ mm in laboratory experiments. We also used sands of this fraction in experiments.

V.F Pushkarev conducted laboratory experiments on a wide stream model. We now modify this (1) connection for trapezoidal channels with different lateral slopes. To do this, we express the connection (1) in the following form:

$$h_{gr} = \phi\left(0,00445\frac{\upsilon_0^2}{gd_0}h_0 + 0,049h_0\right), \qquad (2)$$

here ϕ - a parameter that depends on the channel side slope coefficient m. The following values of this parameter were obtained for channels with lateral slope coefficients using the [8, 9, 10]method of mathematical statistics in the processing of the conducted experimental data and were included in Table-1.

ϕ the dependence of the parameter on the slope coefficient of the channel side

Table-1.

ϕ_0	ϕ			
m=0	m=2	m=2,5	m=3	m=3,5
1,08	0,72			
1,33		1,02		
1,32			1,05	
1,46				1,21

Here ϕ_0 - the coefficient corresponding to the center of the channel bottom.

Method. We assume that there is a relationship between the ratio ϕ / ϕ_0 of these parameters and the flow depth ratio of the grid height, i.e.:

$$\phi / \phi_0 = f(h_{gr} / h). \qquad (3)$$

According to Table 2 in Figure 1 $\phi / \phi_0 = f(h_{gr} / h)$ a graph of the curve constructed along the connection is shown.

$\phi / \phi_0 = f(h_{gr} / h)$ **connection table**

Table-2.

ϕ / ϕ_0	0,67	0,77	0,80	0,83
h_{gr} / h	0,22	0,30	0,32	0,41

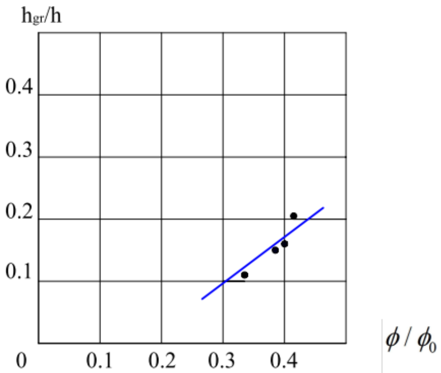

Figure. 1 $\phi / \phi_0 = f(h_{gr} / h)$ **connection table**

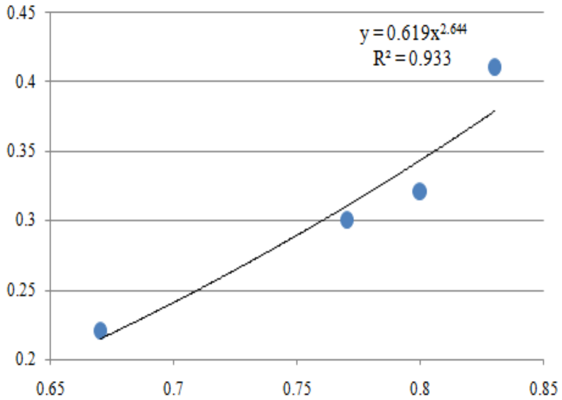

Figure. 2 Regression analysis

From the connection graph shown in Table 1 and Figure 1.above $\phi / \phi_0 = f(h_{gr} / h)$, or using formula (2), it is possible to calculate the heights of the grids appearing in the center of the channel and on the side slopes. The results of the regression analysis show satisfactory performance (Figure 2).

Figure 3 shows a comparison of the calculated values of the grids with the laboratory experimental data. This comparison shows their close proximity.

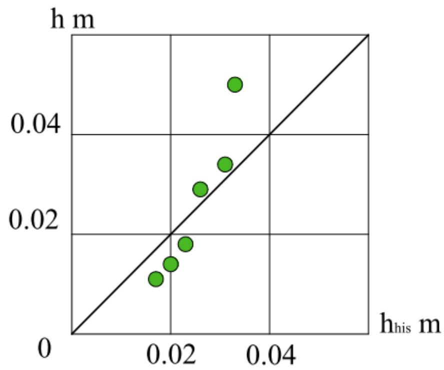

Figure 3. S-Comparison of the height of experimental ridges (3.22) with calculated ridges

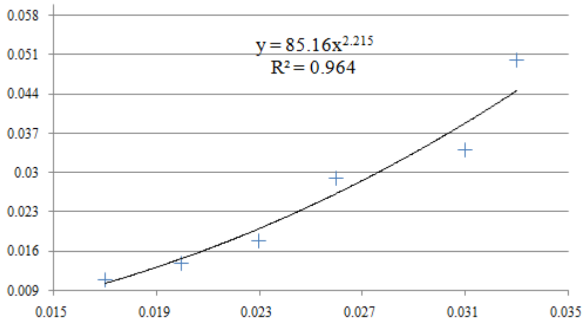

Figure 4. Regression analysis.

The results of the regression analysis also showed satisfactory results (Figure 4).

Results and Discussions. We now consider the problem of determining the length of the grids in a channel constant flow. We know that many studies to determine the length of gryads have concluded that their parameter is variable and that it is not stable. With this in mind, we use the following formula of B.A. Shulyak, which has a simple appearance in determining the length of the grids under the conditions of the experiment: [10, 11]

$$\ell_{gr} = 5,55 h_{gr}, \qquad (4)$$

here h_{gr} - ridge height.

Comparison of experimental data on grid lengths under constant flow conditions (3) calculated according to the calculation formula

Table-3.

Experiment №	m	h_0, m	υ_0, m/s	experiment		calculative		$\Delta = \frac{(h_{gr})_{his}}{(h_{gr})_{lab}}$ m	$\Delta = \frac{(l_{gr})_{his}}{(l_{gr})_{lab}}$ m
				h_{gr}, m	ℓ_{gr}, m	$(h_{gr})_{his}$, m	$(\ell_{gr})_{his}$, m		
1A	2.0	0,127	0,225	0,013	0,06	0,009	0,050	0.69	0.83
2A		0,12	0,26	0,014	0,06	0,0095	0,052	0.67	0.86
3A		0,112	0,30	0,016	0,08	0,010	0,055	0.62	0.68
4A		0,123	0,34	0,018	0,07	0,0137	0,076	0.76	1.08
5A		0,151	0,40	0,02	0,09	0,021	0,012	1.05	0.13
6A		0,157	0,47	0,021	0,011	0,028	0,015	1.33	1.36
7A		0,164	0,56	0,023	0,011	0,039	0,021	1.69	1.90
1B	2.5	0,154	0,15	0,020	0,08	0,010	0,055	0.5	0.68
2B		0,15	0,25	0,022	0,07	0,0168	0,093	0.76	1.32
3B		0,128	0,30	0,023	0,09	0,0178	0,098	0.77	1.08
4B		0,155	0,35	0,026	0,10	0,026	0,14	1.0	1.4
5B		0,157	0,4	0,030	0,12	0,031	0,17	1.03	1.41
6B		0,151	0,5	0,032	0,12	0,044	0,24	1.37	2
7B		0,164	0,55	0,035	0,13	0,055	0,30	1.57	2.30
1C	3.0	0,14	0,18	0,017	0,10	0,011	0,06	0.64	0.6
2C		0,127	0,25	0,02	0,11	0,014	0,077	0.7	0.7
3C		0,137	0,30	0,023	0,12	0,018	0,099	0.78	0.82
4C		0,137	0,42	0,026	0,12	0,029	0,16	1.11	1.33
5C		0,111	0,53	0,031	0,13	0,034	0,188	1.09	1.44
6C		0,139	0,58	0,033	0,15	0,050	0,277	1.51	1.84
1D	3.5	0,145	0,19	0,021	0,11	0,014	0,077	0.66	0.7
2D		0,15	0,25	0,024	0,10	0,019	0,10	0.79	1
3D		0,136	0,32	0,028	0,12	0,023	0,127	0.82	1.05
4D		0,138	0,4	0,032	0,13	0,033	0,18	1.03	1.38
5D		0,146	0,52	0,037	0,15	0,052	0,288	1.40	1.92
6D		0,127	0,57	0,041	0,15	0,053	0,29	1.29	1.93

This formula is based on laboratory and natural research data conducted by the author and has qualitative indicators, but is not without its shortcomings. This formula does not take into account the occurrence of gryads and the time during the process of movement. Above we determine the height of the grids using the method proposed by the side and by putting the formula (3) we get:

$$\ell_{gr} = 5,55\phi\left(0,00445\frac{\upsilon_0^2}{gd_0}h_0 + 0,049h_0\right). \qquad (5)$$

This is a modified formula by us, which takes time into account.

Table 3.3.4 includes the laboratory experimental data obtained to determine the length of the subsurface ridges occurring in the steady motion of water and the values calculated according to the formula (5).

Figure 5 shows a comparison of the laboratory experimental data obtained to determine the length of the subsurface ridges occurring in the steady motion of water and the values calculated according to the formula (5). From this we can see their closeness.[12, 13]

The results of the regression analysis also showed satisfactory results (Figure 6).

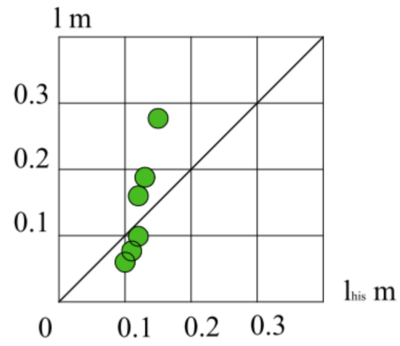

Figure 5. S-Comparison of the length of the experimental grids (3) with the calculated grids

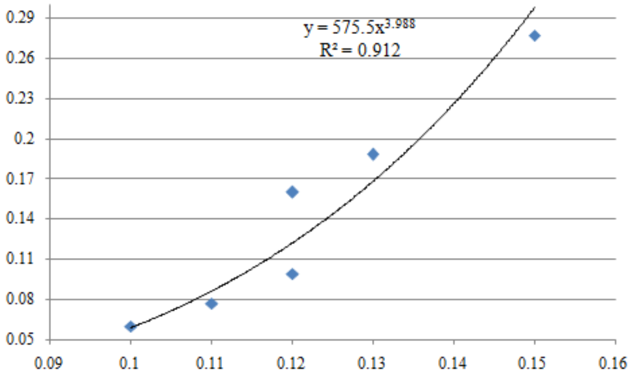

Figure 6. Regression analysis

Conclusion. In the database of the conducted experiment and on the basis of the connections for determining the height of the ridges obtained by VF Pushkarev and the length of the ridges obtained by B.A. Shulyak, these connections were modified accordingly;

- Comparison of experimental data with the values of the calculated connections showed that they are satisfactorily close to each other;

Hence, formulas (2) and (5) obtained on the basis of the above considerations and experimental data conducted under laboratory conditions can be used to determine the respective heights and lengths of the ridges in the steady flow of groundwater channels.

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RESEARCHING THE SEDIMENT AT THE BOTTOM OF STREAMS WITH A COMBINATION OF CLEAR AND TURBULENT FLOW

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Abstract. *A technique has been developed for calculating the transport of bottom sediments when applying waves to the flow for conditions of clarified flow on the basis of laboratory research and analysis of modern ideas about the transporting ability of channel and wave flows in large earthen channels. As far as the authors of this article know, for the conditions of the clarified flow, there are no calculation methods, despite*

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