

The good quality of the water from the lakes formed in the former lignite open-pits Urdari and South Pesteana and the multiple possibilities of their use contribute to the local economy on medium and long term, in the context of mine closure. The ecological benefits consist of reducing the impact on environmental components and improving their quality, the harmonious reintegration into the landscape of the former mining perimeters, the restoration of the ecosystems adjacent to the remaining gaps, and the emergence of aquatic ecosystems.

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BIOLOGICAL TESTING OF ROCKS AND THICKNESS OF THE BULK SOIL LAYER FERTILITY

Kerch iron ore deposits industrial development was occurred in the middle of nineteen century (Lebedinsky, 1988). There were three iron ore and one limestone open-pit mines, dressing plants etc. 60% of deposits are overlaid with brown (oxidized) and roe (oxidized redeposited) ores with oolitic and rarely disseminated ores. The

ferrum and manganese are the main components of iron ore, while phosphorus, arsenic, calcium and magnesium oxides and others are adulterants (Kharytonov et al, 2013). Land disturbed by open pit developments (with overburden rocks brought to the surface of the day) without artificial application of pre-removed soil mass on them is a very long and complex restoration process (Tarika and Zabaluev, 2004). There is a need for targeted reclamation, including work to preserve the upper fertile soil layer. Despite this, the reclamation technology is used that does not provide for selective excavation of overburden rocks and separate dumping them into industrial dumps.

As a final result the mechanical mixing of overburden rocks is carried for the formation of complex technical mixtures for leveling and serving as the underlying basis for the bulk layer of soil mass (Kudrik et al., 2010). The use of peas as a biological indicator was due to the fact that this medium-demanding plant removes restrictions due to different nitrogen content in genetic horizons caused the effect of nature nitrogen fixation and can record changes in environmental conditions that plants of other trophy groups are not able to respond to. The results of the pot experiment allow us to get data on peas productivity depending on kind of soil horizon (Table 1).

Table 1

Peas growth indexes on different soil horizons in the pot experiment

Soil horizons	Productivity, g/vessel	%
H	6,78	100
HP	3,37	49,7
Phk	2,35	34,7
H+HP	5,53	81,6
H+HP+Phk	4,87	71,8

The effective fertility of the soil mass of a mixture of three soil genetic horizons (H+HP+Phk) was 71.8 % of the fertility of the humus horizon.

The soil mass, consisting of a mixture of humus and first transition horizons of southern black soil (H+HP) occupies an intermediate position in terms of fertility between the humus and first transition horizons.

The impact of the type of soil horizon on the pea yield was studied in the conditions of roughed terrain (Table 2)

Table. 2

The yield productivity of peas grown in rough terrain		
Slope exposition	Soil horizons	Yield, t/ha
Plain	H+HP+Phk	12.1
Northern	H+HP	13.9
Southern	Phk	11.0

High peas yield level in case of H+HP soil profile was due to better soil moisture conditions in slope with northern exposition. The ratio of N:P:K in the plain site (H+HP+Phk) was 1:0.25:0.5. The lack of upper and lower transition horizons leads to a change in the ratio of N: P: K to 1: 0.17: 0.36 (H+HP) and 1: 0.23: 0.4 (Phk) respectively.

The yield of the peas green mass in the trials with application to loess-like loam and gray-green clay of 50 cm of black soil exceeded the yield on rocks by 5.93 t/ha or 70.4% and by 6.47 t / ha or 62.1 % (Table.3).

Table.3

Peas yield in trials of reclaimed lands with rocks and black soil, t/ha

Trials	Yield
Loamy like loess (LLL.)	8,40
LLL +50 cm of black soil (BS)	14,35
Gray-green clay (GGC)	10,42
GGC+ 50 cm BS	16,89

Gray-green clay proved to be the best underlying base for the bulk soil layer. It was 2.54 t / ha or 17.7% of increase in the peas yield in comparison with loess-like loam. It was established that optimal ratio of clay minerals provides rather high capacity of grey-green clay absorption. It make possible to consider this mining rock as a potential water proof layer to construct artificial soil-ecological profile.

The ecohydrogeological background of reclaimed lands forming and exploration was worked out. It foresees an environment restoration of disturbed lands to manage flow down, atmospheric precipitations taking aside. The process of the reclaimed profile biogenetic horizons formation and promotion with total depth 1.0-1.2 m and involvement of more suitable rocks for artificial water proof layer were tested.

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ENERGY EFFICIENT CONTROL REGULATOR DEVELOPMENT FOR THE ASYNCHRONOUS MOTOR WITH LONG-TERM OPERATING MODES USING THE MICROCONTROLLER

It is known that the industrial complex of Ukraine meets its own energy needs by about half of what is needed [1]. At the same time, the other half of the needs are provided with imports, depending on the type of minerals it is from 20% to 85% of demand. If a contingency appears, this can lead to failure of the normal operating mode of the power supply. On the other hand, industry and social infrastructure using equipment with low energy efficiency. As a result, the impact of these problems on the energy intensity makes the economy of Ukraine uncompetitive in terms of long-term investment.

Use of electric drives consumes up to 70% of the electricity from the entire power supply of the enterprise. At the same time, a significant part of it is spent on the operation of pump and ventilation systems, which, being powerful systems with a long-term operation