

# MONITORING THE MAIN ENVIRONMENTAL FACTORS DUE TO THE MINING ACTIVITIES FROM ROSIA JIU PERIMETER

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***Abstract:** Environmental protection in our country has come to represent a matter of national interest and an obligation of the authorities and central and local government, and all natural and legal persons. Developing mining industry exerts negative influences on the environment manifested in all phases of mining processes.*

**Keywords:** surface and groundwater, groundwater levels, measurements.

## 1. INTRODUCTION

In Gorj county, by day coal exploiting, were degraded large areas, thereby producing a huge impact on the environment. These lands modified natural lithological structure depths from 1,0 m to 150m, and operating outside the perimeter, large areas are occupied permanently for submission dumps outside. Instead missing fertile soils currently meet various lithological materials, the physical and chemical, which is protisolurile anthropogenic.

These anthropogenic soils provides a sufficient volume edafic useful for the development of the root system of crop plants, but are lifeless without specific essential feature of a soil evolved, namely: fertility. By disappearance of soil, means the disappearance of a "living body" format for hundreds of years. Therefore, the main intervention for decreasing the impact of the mining industry is the rehabilitation of the affected areas to end exploitation by establishing the necessary measures for setting a destination area for environmentally compatible.

The action recultivation destroyed by mining There are three main periods: arranging technical mining, improving biological and agricultural exploitation itself.

Mining and re-cultivation of biological redevelopment of areas affected by the Jiu Rosia career must be made consistent with the economic objectives of the area municipalities Farcasesti, Urdari and bilten, which will be returned to those areas. These studies consider establishing soil fertile soil thickness before and after fitting being harvested soil samples and analyzing the profiles to characterize them in terms of physicochemical.

Following theoretical studies, surveys and laboratory experiments on the ground made over the years, resulted in a variation of indices agrochemical and appropriate, the playback aside, fertilization specific, differentiated for each dump or surface recultured land. Therefore, soil and playing in the economic cycle and in particular aside land compromised of particular importance, removing the effects of operating activities to date coal.

In this regard, the coalfield Rovinari, have applied a complex of construction and technical mining, reclamation and agro-technical, leading to restoration of fertility of degraded soils and create a new landscape, optimally organized, similar to that existing before mining.

Besides the negative side there are positive effects were felt by the population works in mining with the onset. These were economic in nature since led to the development of local roads and utility networks through the streets. Not least meant to ensure jobs for local people

and commuters with an above average income and secure. In a word meant socio-economic development of localities.

## **2. MONITORING DISCHARGES FROM TREATMENT PLANTS OR COLLECTION PLANTS**

Water resource management is an integral part of the sustainable development concept, and we know how to take care of water will depend on the quality of life of future generations. Waters discharged from the career horizons come from groundwater and rainfall.

The technological process of exploitation does not affect the quality of these waters, so monitoring of discharges during the activity and post-closure refers only to the wastewater generated from inside and from the coal deposit. Case demolition enclosure eliminates the need to monitor the cessation of water discharged in the case of Rosia Jiu career. In terms of the level of water accumulated in the gap remaining in the post-closure, by maintaining in service station pumps at the bottom of the pit will be created conditions for their discharge in the canal valley and here in channel regularized the Jiu river.

It was provided regular desilting of canals guard on the perimeter career. We consider necessary to follow the effects they will have accumulated water in the pit of the land remaining in its neighborhood and to this end will be carried out regular observations and topographic and hydrographic work performance monitoring while the surrounding terrain.

For a better management of water resources and schedule to phase concluded with the Romanian Waters National Administration have achieved the following: all subunits were installed water meters to highlight water consumption from underground sources; flow meters were installed on all exhaust pipes water from Rosia Jiu Quarry Mine, to record volumes discharged; recognition suspensions of effluents, given that the National Company of Lignite Oltenia Targu Jiu has no its own laboratory, was contracted to specialist units performing physical and chemical analyzes.

Analyses are conducted monthly and enable knowledge of quality indicators of wastewater, and so far has shown that the waters do not contain hazardous substances or priority hazardous substances. It recommended the execution of works and studies tracking restore aquifers in the dump body interior.

## **3. AIR QUALITY MONITORING**

Since the pits today, coal and tailings transport is done almost entirely with conveyors, dust emission rate from this operation was drastically reduced compared to transport by car. Career activity that generates an impact in changing air quality by: increasing the emanation of gases such as methane, exhaust and means of transport; Dust emissions from coal deposit, deposits dumps, excavation areas; driveways pit and heap, embankments and landfill and quarry plant covered by high heat or wind and dust emissions are generating. Another possible contaminant is generated by auto-ignition of coal deposits or strata outcropping of the release of gases with a high CO produced by incomplete combustion.

Road traffic pollutes the exhaust emissions of NOX, CO<sub>2</sub>, Pb, noise, asbestos, hydrocarbons, smoke, etc. From , periodic measurements made in situ "on the concentration of dust, there are outlets where dust concentration is higher in places such as cutting speed career point drive The dump tailings deposition and distribution nodes. According to the analysis report and the reports of the Ministry of Water and Environmental Protection -

Protection Inspectorate of Environment - Targu Jiu emission of coal dust, noise, pollution in the deposit of coal produced during procedures for loading and unloading exceeded the permissible limits, the a width of approx. 50 m along the deposit. Studying and Environmental Balance Level II conducted in 2008, which were sampled and analyzed, the results lead to the following interpretations:

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Immissions are envisaged for protected areas and residential areas where sediment particles has a value for the maximum admissible concentration of 17 g / m<sup>2</sup> / month, according to STAS 12574-87 and value for respirable dust is regulated by the Order 592/2002, with a maximum permissible concentration 50µg / m<sup>3</sup>.

2 samples were taken in normal working for 2 samples for sediment particles and particulate matter in Table 1.

Table 1. Imissions measured in residential area

Sample	C.M.A.	The measured value	Regulating C.M.A.
1.	17 g/m <sup>2</sup> /lună	32 g/m <sup>2</sup> /lună	STAS12574-87
2.	17 g/m <sup>2</sup> /lună	29 g/m <sup>2</sup> /lună	STAS12574-87
3.	50µg/m <sup>3</sup>	183,85 µg/m <sup>3</sup>	Order 592/2002
4.	50µg/m <sup>3</sup>	175,26 µg/m <sup>3</sup>	Order 592/2002

It is noted that the results that far exceed the maximum allowable concentrations are non-compliant due to diffuse immission of the two companies: Rosia Jiu Mining and Energy Complex Rovinari.

The location lignite deposit, shared by the two companies, is a major source of ambient air pollution and pollution induces a significant environmental factor air.

#### 4. MONITORING THE NOISE

The equivalent noise level measured on and regulated by STAS 10009/1988 and Order no. 536/1997, the permissible value is 50 dB day and night equivalent noise level measured, maximum permissible value is 40 dB. The equivalent noise level measured exceeds the maximum allowed receptors overnight protected at all points where measurements were conducted. Measurements were used for sound level meters and noise measurement points were placed in front of objectives protected residential area, at a distance of 3 m and a height of 1,5 m above ground. The results of measurements at the measuring points are in table 2.

Table 2 Measurements of noise in residential area

No.	$L_{Aeq}$ db permissible value in the day	$L_{Aeq}$ db night permissible value	$L_{Aeq}$ dbequivalent noise level measured	$L_{Aeq}$ db the equivalent noise level measured in the night
1.	50	40	59,8	52,3
2.	50	40	50,2	48,3
3.	50	40	51,6	47,2
4.	50	40	53,2	48,1
5.	50	40	68,0	-
6.	50	40	61,1	-

If the last two points of measurements of noise at night, were not carried out due to failure of conveyor belts. Daytime high values, with overruns of between 12-14% is recorded in 3 points, as can be seen from the graph, in other sections where they performed measurements, breaching the noise levels are lower, being close limits.

## CONCLUSIONS

Coal deposit has a significant environmental impact and to consider measures to protect residential areas and hence the environment.

In the pit there were no reported exceedances of permitted levels in terms of emissions and contaminant particulates in the air. The overall level of municipalities across which manifests influence of Jiu Rosia career, termination of the extraction of lignite will not entail significant changes in air quality in relation to the current situation, but at close range will see an improvement in the situation.

During the operation will be taken the following measures to combat air pollution: During the summer the dust concentration in the atmosphere increases due to drought are provided mobile sources sprinkle access and maneuvering areas; devices for retaining particulate discharge points coal, such as conveyor belts carcasări local and splashing water.

The coal deposit careers loosening runs regular coal stocks and a move to prevent auto-ignition of coal in very warm periods and high humidity, and planting a protective curtain in the coal deposit. Upon closure to prevent auto-ignition of coal layers that remain in slopes will be covered with a sterile layer of impermeable clay for example, a thickness of 15 cm. Decommissioning coal deposit depends not only on the time of closure of Jiu Rosia career as concentrates and the production from this deposit from Pinoasa career. Completion of the greening of the area will remove the adverse effects reported so far on air quality.

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