

ENVIRONMENTAL PROBLEMS ON THE ROADS FROM THE POIANA RUSCA MOUNTAINS

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Abstract: Geological structure of Poiana Rusca Mountains allowed the exploitation of the ore as early as Daciens age. Afterwards, the Austro-Hungarian times gave an impulse to the prospecting studies and to the new mines opening. After 1950, the rapid development of the industry established the increase of the mining in all the country.

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In Poiana Rusca Mountains, all mines were underground mines. They were open by vertical shafts and/or horizontal galleries. As a result, the all massif is full of exploitation and exploration mines. Some of them are closed before 1970, others after the revolution in 1990.

The underground exploitation of the ores established many waste dumps. The dumps of the exploitation mines are bigger than the dumps of the exploration mines. The most of them are unconsolidated and they are affected by erosion. For this reason, these waste dumps are a potential hazard for the population from the area. The old waste dumps were gradually re-vegetated by natural processes, what established an increase of their stability.

In Romania, pechblenda, the main uranium ore, is sometimes associated with sulphides (iron pyrites, chalcopyrite, galena etc.) or with iron oxides. The mineralization with uranium exists in lenticular layers of small thickness.

That is why, the exploitation of the sulphides and iron oxides established to an increase of the radioactivity in the area. So, unlike the uranium milling, which gives a distinct attention to minimize the uranium damage, in these cases the uranium, is recovered in the waste dumps (uranium is not a final product). In general, for these mines nobody made radioactivity measurement till now. The rocks with uranium mineralization recover in the waste dumps, increasing the level to the ionizing radiation exposition. The result of these appreciations is the necessity of the localization of the mines and waste dumps in Poiana Rusca Mountains and the radioactivity measurements for the roads in this area.

In Tincova where complex () exploitations and explorations of ores. The history of this working is broken up (fragmental). The beginning was in the '50. The mine working was continued in 1968-1985 and was stopped in 1992. The single mineral transported was molybdenum (to the railway station Cavarán,

when it was sent to Zam, Baia Mare and to the Russians). The radiation levels found were between 50 and 600 c/s, with maximum levels (600 – 1200 c/s) in the waste dump from 260 Gallery- downstream (this dump is not still there) and in the Valisoru Valley. Now, there are not serious radiation problems in the area of village Tincova.

In this area, all the forestry and industrial roads were laid out and fixed with rocks from waste dumps. This is the situation for the roads on Batasu Valley, Big Valley, Small Valley and Valisoru Valley. But the waste dump from 260 Gallery (upstream on Tincova) had a high content in radioactive ore (may be allanite). The exploitation was stopped in 1992 and in 2003-2004 a Company used such rocks to establish and to rehabilitate the road E 70.

The road DJ 680 Cosava-Voislova was laid out approximately in 1700. An intense traffic was between 1700-1750, 1840-1990, 1912-1918 and 1950-1990 caused by traffic to and from the mines. This road crosses the Poiana Rusca Mountains, from the north to south and makes the connection between DN 68 and DN 68A.

Serious problems appeared when the exploitation at Boul Peak began. Fr. Haner began the investigation in 1863, in the same zones in which the Austrian colonists extracted the ore as early as 1750 (we can see old furnaces and mines on Varnita Valley). He found magnetite ore (25 %) at Boul Peak.

The first radiometric revision was made in 1963, when they found 50 - 910 $\mu\text{R/h}$. Then, they stopped the exploitation till 1969. Later, the flotation and the increase of depth exploitation led to the increase of the level of the radioactivity, till 1750 c/s. At the moment, the levels near the road are 800 – 1200 c/s. On the road there are zones with 200 – 300 c/s. The two ponds have lower levels, 80 – 400 c/s. The dose is 2-3 times more than the dose accepted in the Norms. It's not allowed to stay long time in the contaminated area.

The magnetite ore from Boul Peak is associated with a radioactive ore (brannerite). First, importance wasn't given to the second ore and the industrial roads were laid out at height 0 ISEM, +40 ISEM, +80 ISEM and at the flotation from 917. These industrial roads made the connection to Rusca Montana (Varnita Valley) and to "7 springs" area. Iron ore was transported, day and night, by uncovered lorry, to railway Voislova. At the flotation base was a pond, made near the road. The 18 km of the road ("7 springs" – Ruschita – Voislova) was contaminated. The black slurries "carpet" (magnetite ore from the flotation) covered the road with a layer by 5 – 15 cm thickness.

In 1987 – 1999 a part of the road was modernized and reinforced with the concrete (Ruschita – Rusca Montana downstream) and the other part was laid with asphalt (Rusca Montana downstream – Voislova). They made this directly over the black slurries.

The parapets for protection were made by materials from waste dumps, which contain rocks rich in heavy metals (Pb, Cu, Zn) or radioactive ore

(brannerit). They used, also, the sand from the two ponds (“Porcu” and “Ciotorogu”).

In the middle of Ruschita village is a closed flotation for lead. The rain-off carries lead dust (powder) from the mountainside to the road. The cars spread the drying dust in the air, till at the 4th floor of the apartment houses.

Another problem is the transport of the marble with the big lorry. That road was planned for the vehicles less then 16 tones. At the moment, it is used by vehicles with more then 45 tones. These vehicles run at each 15 – 25 minutes, between 8 and 18 o'clock

Therefore, there are many negative effects:

- Some plate from concrete was dislocated or broken up. So, the vehicles run in a one-way traffic. The rain washed away the slurries below the plates and transported it till the stream.
- All the buildings near the road (0,5 – 1 m for the most of them) are cracked. Some of them are demolished. It is necessary to decrease the speed or to reduce the charges of the heavy vehicles. If these conditions will not be respected, the traffic will be stopped.

Conclusions:

- Council Directive 75/442/EEC of 15.07.1975 on waste was not applied. In accordance with this, it is necessary to lay down minimum requirements in order to prevent or reduce as far as possible any adverse effects on the environment or on human health which are brought about as a result of the management of waste from extractive industries:
 - Tailings (i.e. the waste solids or slurries that remain after the treatment of minerals by a number of techniques);
 - Waste rocks;
 - Overburden (i.e. the material that extractive operations move during process of accessing an ore or mineral body);
 - Topsoil (i.e. the upper layer of the ground).
- Communal and county roads were laid out using materials from waste dumps, placed near the roads. Therefore each company should be very attentive when he uses these materials. In order to minimize the risk of accidents and to guarantee a high level of protection for the environment, for the workers and for the beneficiaries, each operator waste facility should applies a major – accident prevention policy for waste.
- Because of the special nature of the management of waste from the extractive industries, it is necessary to introduce specific application and permit procedures in respect of waste facilities used to receive such waste.

- In accordance with UNRCR Convention on Access to Information Public Participation in Decision-making and Access in Justice in Environmental Matters of 25.06.1998 (Aarhus Convention), the public must be informed of the application for a waste management permit and the public concerned must be consulted prior to the granting of a waste management permit.
- The problems were not considered, before, for the access zones to different installations or to the platforms for transport and for load-unload.
- Should be establishing, also, the monitory procedures during and after-closure of waste facilities. The Directive 1999/31/EC required these procedures, but the information not arrive in time at the companies or at the beneficiaries.
- The companies used and use yet sand from ponds or alluvial sand without respect the Directive 2000/60/EC of the European Parliament and of the Council of 23.10.2000, which establish a framework for Community action in the field of water policy.
- When they use these types of waste, it is necessary to apply Article 7 of Directive 75/442/EEC which requires the management of waste does not conflict directly or otherwise interfere with the implementation of the relevant waste management plan.
- Considering that many mining activities was stopped long time ago, when a company lay out a road or uses materials (waste) from mining areas, it is obligatory to consult the public. In accordance with the provisions of Directive 2003/4/EC the European Parliament and of the Council of 28.01.2003 on public access to environmental information, the population from the respective area is the first beneficiary and the first affected by the construction. Therefore the public concerned have the right to say there opinion. The results of the discussions will be considered for make decisions.

NOTES ON THE AUTHOR

Mircea GOLOSIE is an engineer in telecommunications. He has implemented the first integrated communication systems at "Politehnica" University in Timisoara. He has also developed transmission systems for remote areas, such as abandoned mines. He developed a system of mobile laboratories to research the contaminated areas. His interests include old engineering, paleo-engineering. He has published scientific articles and books on durable development. He is member of various international organizations and a specialist on emergency situations (DEF-Environmental Danubian Form; TIEMS-The International Emergency Management Society).