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Post- ecologyzation disasters- Case of Rusca Montana and Ruschita localities

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Abstract- After some wrong ecologizations, the phenomena of chemical pollution and radioactive heavy metals may increase. Also, the geomorphological stability of area can cause major disasters. In this paper it shows the real situation from an area where non-radioactive minerals were extracted but had highs levels of uranium.
Keywords: disasters, post- ecologyzation, uranium

1. INTRODUCTION

The industrial history of the area is complex. Soil and subsoil wealth led to a special development in different historical stages. At the first stage of the iron ore and the begining of the second stage, in area was developed an complex and ecological metallurgy of iron and steel. In the furnaces zone are not found the caracteristic of furnace slag. The kilns was „capping" (sealing the top) with limestone. The Geto-Dacian were good craftsmen but when appear Castellieri (the metallurgycal centers), these followed the Dacian tradition. The epimethamorphic zones formed from undue magma contain many types of ore. The first comprehensive study was made by the austrian geologist P. Partsch in October 1896 as a delegate of the Austrian tax authorities. His studies were based largely on research in the domain of iron ore, made sice August 1803 by Joseph Bodoki, mine controller and inspector of Iron's pit coal. Then came Leon Hard Aigler, Anton Bogozi and others. After those visits, area begins with an masiv development of iron ore extraction, processing and obtaining raw iron. In parallel are built roads, railways and cableways. All these works will result a strong industrialization of Poiana Rusca-Ruschita area but also surrounding areas.

After the uranium's discovery of Martin Klaprot sice 1789 and the thorium sice 1828 by the Belzarius make that after 1890, in Romania, to developed research in domain of thouse elements which later the exploration and exploitation to become secret. In Ruschita area on upstream Varnita valley, the small iron exploitation are abandoned and begins the large exploitation of „Boul" Peak, „Raci" River, upstream Pades valley, then the lead exploitation of Ruschita locality and the complex exploitations from upstream of locality.

In left upstream are formed the 614, 654, 705, 742, 782, 820, 860, galleries; in right upstream begin the „Raci" River exploitation and the „Morii" River exploitation. In 1863, Fr. Hauer discover the magnetite with an 25% concentration, causing „beating galleries" +80, +40, 0 (altitude 1053 m).
Each gallery will fork horizontally in a fan shape. In 1963 at an radiometric revision was observated that in deposit are rocks which had from 50 level to 910 μR/h. It was found that iron ore contains 175 μR/h – at 250 gr and in galleries have measured high levels of thoron- 125 pCi/l and radon- 7,2 pCi/l. In 1969 year, the 80 and 40 horizons are not comunicated between them with the 0 gallery (3 ISEM), but in the end of november, at one time with perforation of climbing, the level of radioactive gas was homogenized. The maxim level was in the 4 edgewise gallery at the + 80 main horizon, at 25 m. On that time the lung contamination was evaluated abaut 20-40% MCA (maximum concentration admitted).[5]

Fig. 1- The 3 ISEM collapse- gallery

If in the period between 1963 year and 1969 year, the mines was temporaly closed because of some wrong works (was outbursted to much in few galleries, in ceiling area) all three levels are collaopse in falls. To continue the ore transportation from dump to floating station, the mountain is perforated, under galleries, by a tunnel at 917 altitude where was and the preparation foundry. Instead of the three systems of galleries is form a cone which was near by the Colony.

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Fig. 2- „Boul" Peak- collapse

This disaster increase the contamination of area (of water the 6th time and of vegetation the 3th time).

In that period the measurements was made with assman psychrometer for mine microclimate and gas: ORSAT appliance for O_2 and CO_2 calorimeter for CO with reactive palladium chloride.

2. MATERIAL AND METHODS

This study was made on base of own research. We thought that it's useful to identify and the history of mining work for to understand all the phenomena which take place and are into independence bond. The working methods have been interdisciplinary and had following stages:

- the identification zone on maps and using the technique airpartial;
- discussions with locals and authorities who worked in the area;
- measurements on the field and laboratories in the country and abroad;
- questionnaires applied inhabitants.

Materials- NBC (nuclear- bacteriological- chimical) autolaboratory provided with radiopolymeter and fast analysis putty.

3. RESULTS AND DISCUSSIONS

After the ore termination on Varnita slope (in reality and in the sterile tailing remained much useful ore, the measured values exceeds 700-1000 Cps- cicli per second- 0,2 mR/h) begins the vertical exploitation even from tunnel midle. The new diged galleries 870, 825, 705, 580, 525, follow the magnetite ore in depth, the evacuation making on „climbing"; ore was exploitated between 2500t/month and 6000t/month. From this moment appear an new ecological disaster which is the contamination of water:

U_{238}- 0,251 Bq/l- limit 4,2 Bq/l
Ra_{226}- 0,038 Bq/l- limit 0,088 Bq/l
Th nat.- 4,88 Bq/l- limit 4,2 Bq/l

Fig. 3- The 917 complete flotation

Pumps flow over, the contaminated water directly in near river. At these phenomena accumulate and the contamination with flotation pulp. The radiometric evaluation, gamma global, show this value 900- 1800 Cps (1720 Bq/kg). The transport of proccesing ore was executed with trucks descover on the mountain road which caused the contamination of water from downstream to Voislova railway station (where was the area of depositing and boarding in train). After 2000 year the ecologization works of all galleries and annex-stations begin. In fact cut the iron (larries, locomotives, transformers, engines, pumps, well station, pipes, rails, metal fittings from mines), the buildings are demolished (barracks, annex-building) and at the entry of gallery is built an brick wall. The slopes are not solidify, the retaining walls were not built and the mining works are not revegeted. By those ecologization work, the disaster is increase, the radioactive and heavy metals pollution may be uncontrollable.[3] In 2000 year, after some rain with devastating phenomens, take place a dislocation of an sterile slope which destroy some houses and pile up 6- 8 m of tailings. The slag ironstone slopes, mixed with branerite, are pushed to upstream and the contaminated water arrives in potable water tanks from Ruschita locality. In the area with mountain roads where the support wells are collapse, some of the mountains slope with their vegetation are dislocated.

Fig. 4- Dislocated slope

Fig. 5- „Ruschita" locality- lead flotation

In the midle of the Ruschita locality, the slag slopes of lead flotation arived to enter on windows at lower levels of apartment building.

All these dislocations of mine material have made that county road to be destroyed in upstream, in totality and partially in downstream; thing that made to isolate the villages Rusca Montana and Ruschita from national road. Some of disasters have been removed but had not executed works to prevent a new catastrophe. Pollution with radioactive elements has not been reduced by ecologyzation nor pollution with heavy metals of some elements.[1] Heavy metals identified in that area are: alofan, andalusite, andradite, azurite, barite, barkevikit, blend, brochantit, brucit, ceruzit, desmin, galenit, hematite, hemimorfit, ilvait, ocher, magnetite, malachite, melanterit, pirmorfit, serpentinite, siderite, skarn, tremolite, talc, wulfen. An potential danger for disasters is the existence of two mining settlers located a few hundred meters from other (it's "Porcu" settling pit and "Ciotorogu" settling pit). They are located in opposite valleys. At these mining work, were executed a several minimum works safety (the construction of a drainage ditch for rainwater on the side of the mountain; the drain water surface section of the river, under the settling pit was consolidated). But the metal grates of river enter under settling pit are exposed to clogging. If that phenomenon will occur, the excess of rainwater which will accumulate on the surface of the settling pit, this will cause the break of dam (which protect the downstream) accumulating material mining.

Fig. 6- „Porcu" settling pit

That material will not only eights valley, but will block the road and will contaminate a considerable length on "Padeş" valley, till after the confluence with the "Bistra" river. After some analysis, in the settling pit, were identified rare metals (gold, silver), heavy metals (lead, copper, zinc) even radioactive metals (uranium, thorium, yttrium); dislocation potential is high because was extract large amounts of marble blocks from dam protection; marble blocks which was used in constructions and local industrialized to obtain construct products (marble powder and kibble for mosaic). The displacement phenomenon can be amplified by the destruction of vegetation situated on dam. Both, the horizontal surface and the outer slope is crossed by ditches caused by rainwater flow; considering that the base is not stabilized in any way, are high chances that the dam to dislodge.

4. CONCLUSIONS

In conclusion, on this issue, I consider that a long-term monitoring should be mandatory, especially if that in exploitation with radioactive material must be a minimum period of 25 years after ecologyzation.

From efectuated researches, results that would be necesary a new works ecologyzation, correctly executed which to be focused on all slopes stabilization with mining works and situ treatment of water which draining from galleries.

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