SETTING PITS - NEGATIVE ELEMENTS IN THE MIDDLE SPIŠ REGION

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Abstract: *The article evaluates the negative consequences of mining activity on the structure of landscape. Mining has a long tradition in the Middle Spiš Region. After the end of production we can investigate the negative consequences in the underground, but mainly on the surface. There are setting pits and a lot of dumps in the observed area. Setting pits are very negative and dangerous phenomenon in the landscape. They remain in the landscape for several decennaries and his recultivation is high-priced and time- consuming.*

Key words: *setting pit, sludge, the village of Slovinky, the village of Rudňany*

Introduction

The Middle Spiš Region is a central part of large historical region of Spiš. In the past, mining and industrial activities there were very intensive. Rich deposits of mineral resources are there. Mining and industrial activities noticed a strong regress in the latest years. Mines were closed and mining was stopped because of working out deposits of mineral resources and uneconomic mining. Social situation had grown worse for people living there. The mines in the villages of Rudňany and Slovinky belonged to the most important and knowing mining plants in this region.

The village of Rudňany is situated in the southeast from the Spišská Nová Ves town, it belongs to the Spišská Nová Ves District in the Košice Region. The cadastre area has 1 342 ha. The population is 3 196 (in 2004). The village is located in the northern part of the Volovské Mountains. In 1970s and 1980s the mine Rudňany was the deepest mining plant in the former Czechoslovakia.

The village of Slovinky is situated 5 km southwest wards from the Krompachy town, it belongs to the Spišská Nová Ves District in the Košice Region. The cadastre area has 46,45 km^2, it is the largest cadastre in this district. The population is 1 873 (in 2004). The village is located in the northeastern part of the Volovské Mountains and the Hnilecké Mountains. Slovinský brook flows across the Slovinky village and flows into the Hornád river. The mining of copper ore had the biggest importance. Mining activity was stopped in 1993. Now, we can see the anthropogenic mining forms, two setting pits and a lot of dumps on the surface.

Setting pits – mining relief forms

Setting pits belong to the anthropogenic relief forms. They are products of mining activity. They are called *"terrain mirrors"* because of their planar shape. Their genesis is connected with industrial sedimentation. In the view of toxicity sludge material pipes from flotation equipment, setting pits still represent a negative element in the landscape of mining areas (Mazúrek 1998).

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Waste from the processing of mineral resources in the liquid consistence – sludge deposits on setting pit. Sludge are gradually massing, they can have thickness of several ten meters. After the finished production they are gradually drying up (Cicmanová 2004).

Characteristics of the most important setting pits in the Middle Spiš Region

During mining operations the mine Želba Slovinky made use of the two setting pits, but not at the same time. Setting pit Krompachy was built after the accident. The mine Želba Rudňany made use of one big setting pit.

Setting pit Kaligrund

Setting pit is situated in the forest behind an administrative building and a retrograding ore mill. His running was stopped after an accident. The dewatering piping draining water from collectors was broken. The cause of this accident has never been investigated. The building up of a new setting pit was the consequence of the uninvestigated accident. Old setting pit was ranged into recultivation zone.

Its actual shape and size don't match its past range and function. The borders of setting pit are grass-grown. The small depression repleted by red colored sediment is in the middle part of the setting pit. Its look is changing according to the weather. Liquid sludge forms during long-time and under intensive rain falls. When the weather is very warm and dry, wind blows small particles of sludge into the air.

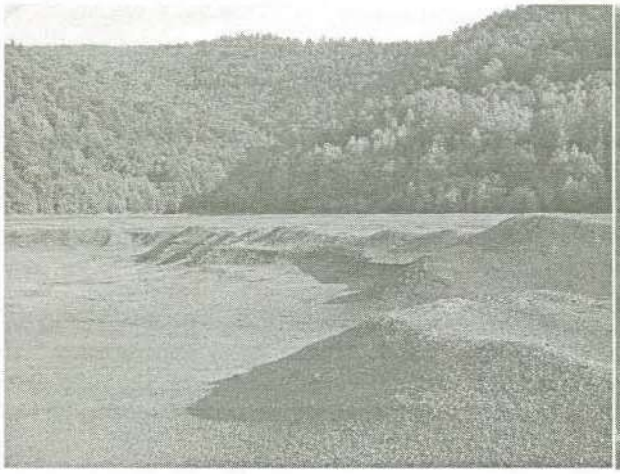
The setting pit fits into the surrounding landscape by plant succession. In a few years, the tracks of formerly existing setting pit will have been gradually disappeared.

Setting pit Krompachy

The setting pit is situated on the border of two cadasters of the Krompachy town and the Slovinky village. It lies on the territory of Krompachy, however, the access path runs across Slovinky. The setting pit was built after the accident and stoppage of the older one. It has existed since 1968 provided that it was likely to have lifetime period to the year 2000. Its area is 7,72 ha. There were three pumping stations located one after another in the direction of sludge pipe, which supplied transport of liquid sludge. It is a setting pit with basic bulk barrier and other elevated barriers built by the process of deposition. The suggested elevation of the setting pit to 565 m a. s. l. means a capacity of 6 468 000 m3 and a height of 132 m, what was a unique height in the country. There was approximately 275 kt of flotation waste stored on the setting pit per year.

At present the setting pit remains a moonscape. There are two ways how to get there, one with ore mill heading in Slovinky, the second alongside the main route. The slope is covered by artificially anthropogenic terraces. The setting pit is without any vegetation.

The localization of the setting pit is not convenient due to certain facts. There is Slovinský brook flowing through Krompachy and flowing to the Hornád river. The accident of sludge running to brook had to be sourted out by Krompachy. In a word, this setting pit is an ecological bomb with having a crust on the top. It is starting to crack nowadays. Its current situation requires the interest if the initiatives and particular measures in turn. **(Footnotes)**



Picture 1 Setting pit Krompachy

Source: Krokusová 2005

Picture 2 The aerial view on setting pit

Source: Cicmanová 1996

Setting pit Rudňany

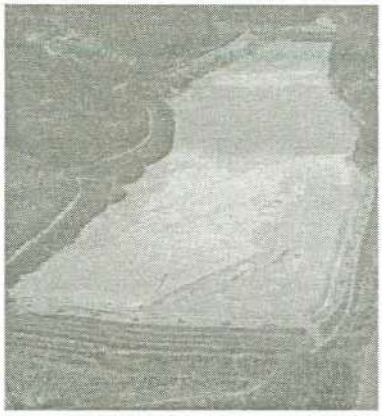
Setting pit Rudňany is situated on the place where the valley of Markušovský brook leads into the valley of Rudniansky brook. The sludge from the ore processing was put there. The underground water, which draws from the Mier shaft, flows into the setting pit. The water that is percolating down is concentrated by drainage and driven to the Rudniansky brook.

According to Law No. 169/1975, the expertise of VVIP Bratislava claimed a setting pit to be classified to second category of water economy works. Based on „the Measurement project" of the year 1986, three-steps monitoring regarding a setting pit is carried out once a year:

- measurement of the ground water level in drill holes situated in the front and at the back of dam of setting pit,
- measurement of the horizontal and vertical movements of control points on the dam of the setting pit,
- measurement of the quantity of percolated water by drainage under basic dam.

There is an emergency setting pit under the setting pit serving to catch the sludge in case of electricity failure.

The quality of percolated water from the setting pit is monitored according to government regulation no. 242/1993 which states the indicators of permissible level of percolated water pollution. The category of other ores the following indicators have been stated: pH, chemical usage of oxygen, contents of insoluble substances, contents of cations of iron, copper, mercury, arsenic, zinc and lead. Department of natural environment in Želba company has declared the percolated waters meets the limits of above mentioned government regulation. The quality of Rudniansky brook before and after the Markušovská valley is also monitored. The quality of water is in concord with relevant directives and regulation (Hudáček 1998).



Picture 3 The aerial view on setting pit
Source: Cicmanová 1996

Conclusion

The Rudňany and Slovinky villages are illustrative cases of mining villages in the Middle Spiš region. In the past, mining activity was quite intensive. Now, mines are closed and mining activity is stopped. We can investigate the negative consequences in the underground but mainly on the surface after finished production. There are extensively and complicated net of worked-out spaces: stopes, drifts and shafts. It is so called „mining underground". Setting pits and a lot of dumps are on the surface. The dumps most frequently exist mining forms. They are of different shape and size. Setting pits are very negative and dangerous phenomenon in the landscape. Each mine has one sporadic two setting pits. Building and running of setting pit is more exacting than of other mining forms. They remain in the landscape for many years and their recultivation is high-priced and time-consuming.

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ODKALISKÁ AKO NEGATÍVNE PRVKY V KRAJINE V REGIÓNE STREDNÝ SPIŠ

Zhrnutie

Región Stredný Spiš patrí medzi zaťažené oblasti Slovenska. Je tu vykonávaný pravidelný monitoring, sledujú sa všetky zložky životného prostredia. Ministerstvo ŽP SR každoročne vydáva správu o stave životného prostredia v ohrozených oblastiach. V minulosti tu prebiehala intenzívna banská a priemyselná činnosť. V posledných rokoch postupný útlm vyústil až do zastavenia ťažby a do zatvárania baní.

Dôsledkom ťažby nerastných surovín sú banské formy reliéfu – haldy, odkaliská, prepadliská a pod. Odkaliská sa nevyskytujú v banskej krajine tak často ako napríklad haldy. Banský prípadne priemyselný podnik využíva počas svojej prevádzky zvyčajne len jedno odkalisko. Odkaliská však predstavujú veľmi nebezpečné a rizikové prvky v krajine. Samotná výstavba a aj prevádzka je veľmi náročná po technickej a aj finančnej stránke.

V regióne Stredný Spiš sa nachádzajú dve veľké odkaliská. Baňa Želba Rudňany využíva odkalisko, ktoré sa nachádza pri Markušovciach. Ide o živé odkalisko, každoročne ho na určitý čas využíva fungujúca prevádzka na Poráči. Baňa Želba Slovinky využívala najprv odkalisko na Slovinkách. Po havarijnom stave bolo vybudované nové na území Krompách. Ide o odkalisko s najväčšou hrúbkou kalu na Slovensku.

Odkaliská sa nepokryjú vegetáciou a nezapadajú do okolitého prostredia tak rýchlo ako haldy. Jemný kal postupne vysychá a vietor ho vyvieva do ovzdušia. Aj po mnohé desaťročia predstavujú veľký ekologický problém.

Recenzovali: Prof. RNDr. Ján Harčár, PhD.
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