Necessity of accomplishing the project

The project is focused on eco-redemiation of two tailing ponds, Bozanta Tailing Pond – Maramures County (Figure 1) and (Google Earth, 2087), coming from gold-silver ores processing industry and *BRAKPAN* Tailing Pond - EAST RAND AREA OF WITWATERSRAND BASIN (East side of Johannesburg town) (Figure 2) coming from gold-silver-uranium processing industry. Both areas have a long mining industry history, in both areas the mining industry having a major role in the economic activity. Baia Mare area is considered as „historical center of non-ferrous mining activity of Romania" and EAST RAND area (South Africa) is the largest precious ores deposit and, the mining industry contribute with 65% to the country's foreign exchange. Due the mining activity in both areas, there are many antropic shapes as results of mining wastes dumping (as tailing ponds; over 20 in Baia Mare area - Table 1 and 27 in EAST RAND area).

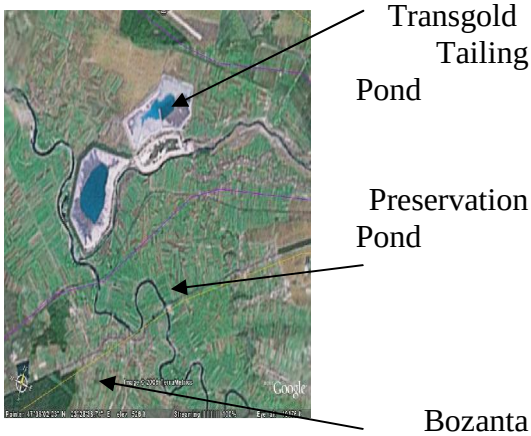


Figure 1. Tailing Ponds near the Baia Mare area (Romania)

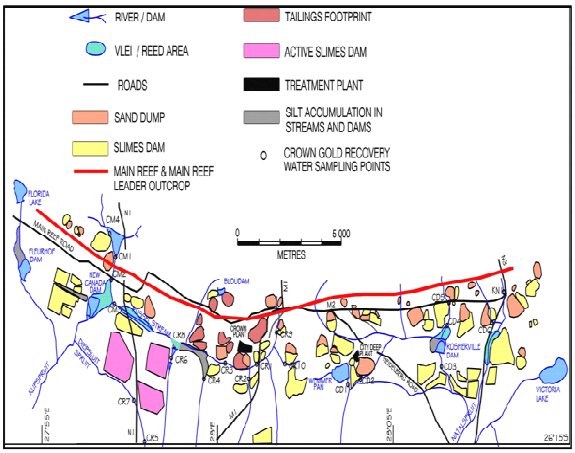


Figure 2. Tailing Ponds near the Central Rand area (South Africa)

Table 2. Situation of tailing ponds of REMIN Company Baia Mare-Romania

Nr.	Mining	Active / Inactive	Type of the pond	Surface (ha)	Stored quantity (mil. tones)
1	E. M. Borsa	Novat – active, activity interrupted	valley	13.8	3.10
2		Colbu 1 – inactive	valley	5.1	2.99
3		Colbu 2 – inactive	valley	2.2	0.90
4		D1 – inactive	slope	7.0	2.80
5		D2 – inactive	slope	7.7	6.6
6		D3 – inactive	slope	6.6	3.90
7	E.M. Aurum	Sasar – old – inactive	plain	15.0	8.5
8	E.M. Baia Sprie	Tautii de Sus – inactive	plain	24.5	13.7
9	E.M. Baiut	Bloaja – active, activity interrupted	valley	15.3	4.2
10		Bloaja – old, inactive	slope	5.2	0.151
11		Leorda – inactive	slope	12.7	1.00
12	E.M. Cavnic	Plopis Rachitele – active	valley	12.2	3.55
13		Malaini – inactive	slope	1.6	0.75
14		Vrancioara – inactive	slope	7.0	3.06
15	U.P.Flotatia Centrala	Bozanta	plain	60.0	43.66
16	E.M. Rodna	V. Glodului – active, activity interrupted	valley	12.0	3.53

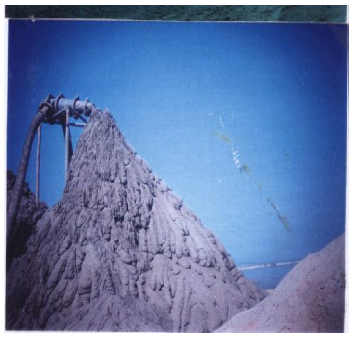
Bozanta Tailing Pond, studied by the Romanian partner-North University of Baia Mare, was built in 1977, has a surface of 1,050,000 m^2, 40 m in depth and enbankment of 18-20^o. In the pond are spilled the wastewaters coming from flotation concentration plants of non-ferrous ores and cyanuric wastewaters coming from Au and Ag extraction plant. Growing in every year with about m, the pond accumulated over 150,000,000 m^3 of wastewaters-gangue (3:1).

BRAKPAN Tailing Pond - EAST RAND AREA OF WITWATERSRAND was built in 1932 and it collect the wastewaters-gangue coming from gold-uranium industry of the area. Assessment indicates over 750,000,000 m^3 of wastes.

Due to a huge amounts of wastewaters and gangues they contain, the tailing ponds represent a continuous threath to environment and human health caused by chemical pollution.

The slope of tailing ponds are made by coarser particles resulted after ores processing and contain high quantities of non-processed ores (chalcopyrite, pyrite, blend, etc.) and the spilled wastewaters contain heavy metals (Pb, Cu, Zn, Cd, Mn, Fe, etc.) and residual cyanides coming from Au-Ag extraction (Figure 3).

Hidrocyclones located on the pond's dam



Construction of pond's dam

Spill of wastewaters in the pond

Figure 3. Processing of wastewaters-gangue

Essential issue should be considered in design, construction and manageing of tailing ponds is the stability. The stability includes *physically stability* (geomecahnically, geochimically, hydrologically, static and dynamic, eolian stability) and chemically stability (low numeber of ravine, low rate of errosion, sufosions, exfiltration and chemically degradation processes). The stability aspects should be correlated with the pollutant impact of tailing ponds on environment by:

- ● Contamination of phreatic and surface waters as acid drainaje (pH = 2-3) and high content of heavy metals (mainly)
- ● Contamination of air and water as dam's errosion caused by the winds
- ● Healthy problems (especially respiratory diseases) of the villages' citizens around the tailing ponds

● Difficulties of vegetation permanently settle on ponds' surface as continuous generation of acidity during the permanently degradation of gangue

● Estethicall degradation of environment