

Site Checking Protocol

Drawn up on 20 October 2011 in the presence of:

The representatives of the TAC (Technical Analysis Committee) authorities, the Alba Agency for Environmental Protection and the Sibiu Regional Agency for Environmental Protection, the Alba County Department for Culture and National Heritage, the Alba Public Health Authority and the local unit of the National Agency for Mineral Resources.

I. Identification data and location

Project holder: SC Roșia Montana Gold Corporation SA (RMGC)

Project name: Rosia Montana Mining Objective

Adress: Roșia Montană commune, Alba county

II. Description of the location and its surroundings

1. The location

The project is located in the region known as the Golden Quadrilateral of the Metalliferous Mountains, which are part of a regional mountain massif called the Apuseni (Western) Mountains of Transylvania.

[Image]

The Cârnic quarry

There are 16 main horizons in the underground, spanning over 300 m vertically and including approx. 45 km of mining works. The state-owned company Roșiamin, a subsidiary of Minvest Deva, carried out open cast mining in the Cârnic Massif (in the Napoleon area) by a few quarry steps until 2004. In the underground, the ore was exploited by the "chambers and pillars" method and in huge caves. It was not possible to visit the underground.

[Image]

The Cetate quarry

[Image]

From the platform laid out on one of the steps of the Cârnic quarry, we were introduced to the Cetate quarry. In the underground it has 12 main horizons, with a vertical span of 200 m and mining works stretching on approx. 40 km. The mining method used underground was "chambers and pillars". At the middle of the 70's underground mining was abandoned and open cast mining began in the quarry – an activity that was discontinued in 2006. The project holder proposes to continue the extraction activities in the two quarries by open cast mining.



Corna Valley (Valea Corna)

In the Corna valley, we visited the future sites of the pond, the secondary retention pond and the treatment lagoons. We started in the upper part of the Corna Valley basin, stopping twice in order to see two of the areas where excavations have been carried out in order to verify the thickness of the clay layer (colluvium), which is a natural lining for the valley. One of the excavations was performed on the slopes of the valley and in the area of the pond basin, while the other was performed under the footprint of the pond dam.

[Images]

The location of the pond was chosen out of the 13 alternatives analysed; it is a valley dam with a capacity of 250 million tons of waste rock, which shall provide storage for the 215 million tons of waste rock resulting from the processing plant and for the two probable rainfalls of maximum 5.5 million cubic meters. The dam will be built of stone. During the general introduction, the conclusions of the risk analysis carried out by the Norwegian Geotechnical Institute were briefly presented to us.

During our visit to the Corna valley, we noticed isolated constructions overlapping the footprint of the pond.

[Image]

From a geological point of view, the region comprises cretaceous deposits of flysch (rhythmic alternation of blackish-grey clay schists and grits); from a structural point of view, the Corna Valley area is an anticline.

Due to this structure, the layers drift towards the slopes, which favours infiltration of the rainfall water or of any leakage from the pond into the subsoil.

From the project holder's explanations, it results that along the Corna Valley slopes, approximately perpendicular on the stratification, there is a layer of clay (colluvium) that makes the area watertight and prevents the water from infiltrating along the stratification planes and into the fissure system of the cretaceous sedimentary deposits. The hydraulic conductivity of the colluvium layer is 1×10^{-6} cm/s.

A feature of the deposits that form the bedrock of the future pond is the relatively high degree of fissuring, which determines the existence of a fissure aquifer in these deposits. This geological structure, as well as the relatively high degree of fissuring of the flysch deposits, has been confirmed by the RMGC geologists. However, they claim that both the fissures and the stratification surfaces have millimetric and sub-millimetric openings and are generally cemented with calcite. Right under the colluvium layer, the upper bedrock displays an intense supergene alteration over a depth of approximately 40 m, which has led to the deposit of clay both on the stratification and on the fissures. The hydraulic conductivity of this area varies between 1×10^{-5} cm/s and 1×10^{-4} cm/s.

The RMGC geologists claim that the bedrock is covered in clayey colluvial material, that is does not grow and does not have the same thickness in the entire area of the Corna Valley (it is up to 12 m thick).

Roşia Valley

[Image]

Roşia Valley is the evacuation point of the waters that are collected in the network of underground galleries, which reach the surface in a point called Gura Minei – located at an elevation of + 714 (horizon 714) and then flow into the Roşia brook. Apart from this major source of mining waters, Roşia Valley also collects mining waters from other, less important galleries, such as the Racoşi gallery. In addition to these

[Signature]

MINISTERUL JUSTITIEI
Aut. Nr 7626/2005
★ LAURA DANIELA
ELENCU
TRADUCĂTOR AUTORIZAT

mining waters, which have a very high pollution degree, draining water comes from certain uncovered areas, which are exposed to the impact of external factors.

Acid waters generated by exposing the sulphur ores to external factors - such as air (oxygen) and water - are either collected underground through the network of galleries, being evacuated untreated through various mine entrances, or are uncontrolledly dumped into the surface waters as surface drainage from the waste rock heaps or from other affected surfaces.

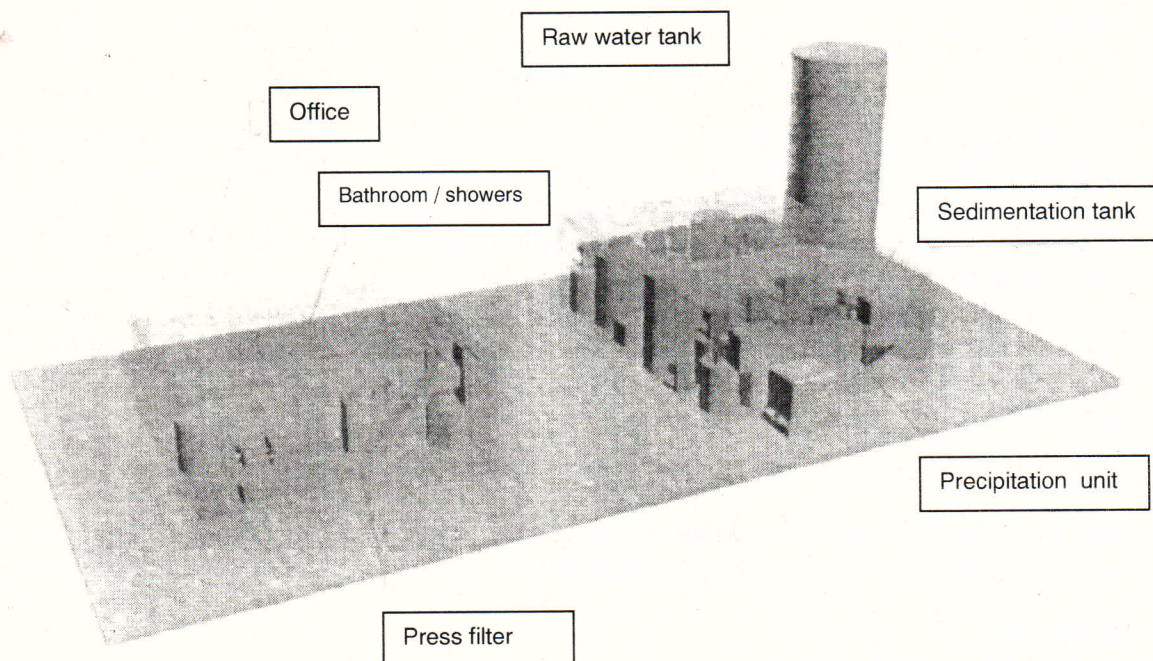
The pilot acid water treatment plant for the Roşia Montană Project

On the site of horizon no. 714, we were introduced to one of the (nano-filtration) treatment technologies for treating the acid mining waters of Roşia Montană that were tested at laboratory scale. RMGC will build a mobile pilot acid water treatment plant within Gallery 714 in order to perform the pilot testing of the acid water treatment technologies

[Images].

The project holder stated that, after RMGC has finished testing the advanced acid water treatment technologies, the pilot plant will be able to be used for testing other categories of acid waters outside of the Roşia Montană region.

3D Model of the pilot plant



L. Eleucu

which mining waters from the underground are discharged by gravity. On average, 80 m³/h of acid waters are dumped untreated directly into the Roşia Valley; they have high concentrations of iron, manganese, aluminium, copper, cadmium, nickel and arsenic, and the pH is 3.

[Images]

The project proposes to collect these waters and to use them as industrial water after metal precipitation and neutralisation of acidity (pH) during the technological process.

2. Surroundings

The Roşia Montană Project is located in the Roşia Montană commune of Alba county, approx. 80 km north-west of the county capital Alba Iulia and 85 km north-north-west of the city of Deva, in the central-western part of Romania. The site lies within the existing mining perimeter of Roşia Montană, in the immediate vicinity of the town Abrud to the north-east.

[Images]

3. Other activities performed in the area of the location

Gura Roşiei – Roşiamin pond under rehabilitation

The pond generated by the activity of Roşiamin, situated in the Abrudel Valley, parallel to road DN 74, was put out of use as early as the 1980s. Waste rock was subsequently deposited in the Sălişte pond, which was used until 2006. The closure programme launched in 2009 is managed by SC Conversmin SA. We could see the above-mentioned site from the bus on our way to the Roşia Montană project site. We could see people working on reinstalling an artificial membrane on the Rosiamin pond, as the initial membrane had deteriorated / slipped off.

[Images]

III Sensitive receptors, regions with a special protection status, protected natural areas of EU interest, restrictions.

On the location of the project, there are no Natura 2000 sites.

During the visit, we spotted no wild animals (probably because we were driving cross-country vehicles), except for isolated cases (e.g. squirrels...)

The distances to the nearest Natura 2000 sites are:

- 14.5 km to ROSCI 0121 – Vulcan Mountain
- 17.8 km to ROSCI 0119 – Muntele Mare (Great Mountain)
- 9.5 km to ROSPA 0087 – Trascăului Mountains

The site of the project comprises the following monuments:

Natural monuments:

- Piatra Corbului protected area of national interest
- Piatra Despicaţă protected area of national interest



Historical monuments:

- Carpeni Archaeological Park
- Funerary Monument at Tăul Găuri
- Market square / historical centre / Gold of the Apuseni-Mountains Exhibition "Muzeu 325"
- Roman galleries in Cătălina Monulești

Piatra Despicață

Piatra Despicață is a block of andesitic rock situated between Roșia Valley and Corna Valley, at the foot of the Cărnic Massif. In 2002, the Commission for the Protection of Natural Monuments of the Romanian Academy approved for this block to be moved to a different site, which will not be affected by future mining works. The monument is included on the latest list of the Ministry of Environment and Forests in order to be placed under custody. According to our information at the point of the visit, a consortium grouping 2 NGOs and the Abrud Forest District have applied for the custody of both natural monuments Piatra Despicață and Piatra Corbului.

[Image]

Piatra Corbului

Archaeologists have highlighted Roman and modern mining works at the surface and in the underground; the works were performed by using water and fire. The Ministry of Culture and National Patrimony has established a 5-hectare protection area.

On location, we were shown the arrangement of the monument, the protective measures to be implemented during the mining works and the planned tourist development of the objective (access road, visiting platform, safe access to the underground, signalling and lighting, guide, informative materials).

[Images]

Carpeni Archaeological Park



Carpeni is an area where two buildings of the Roman administration and well preserved tombs from Roman times were discovered. The constructions cover an area of approx. 1000 sq.m. At the proposal of the National Archaeology Commission, the Ministry of Culture and National Patrimony has established a protection area of 18 hectares. Roman galleries were discovered in the underground, with wooden systems and wheels for draining off the underground waters. The Archaeological Park of Carpeni is outside of the mining project area; it will be researched and preserved as a whole. After research is completed, the network will be restored and preserved *in situ* and developed for public access.

[Images]

Tăul Găuri funerary monument

The National History Museum of Romania conducted research here by in 2001-2003. The monument contains 2 brick sarcophagi, which were robbed from ancient times. Located on the outside of the incineration necropolis of Hop-Găuri, the funerary monument belonged to an important local figure of the mine administration. The findings have already been published in the monographic series Alburnus Maior, which the financial support of RMGC.

The National Commission of Historical Monuments has approved the project for *in situ* restoration of the objective. Furthermore, measures have been taken for its protection and primary conservation *in situ*.

Market square / historic centre / Gold of the Apuseni-Mountains Exhibition “Muzeu 325”

In the perimeter of the Roșia Montană Commune, there are 41 historical monuments, according to the List of Historical Monuments of 2010. 35 of these are historical buildings located within the Historic Centre Protected Area. In the future industrial perimeter, protection areas will be established for the other 6 historical buildings, as well as for the tomb of local hero Simeon Balint. All of these buildings have been recorded in individual Analytical Inventory Sheets, which comprise historical and architectural data for each building. All of these monuments have been under architectural research in view of their restoration. The buildings are part of a continuous maintenance programme, in accordance with the legislation in force.

[Images]

The Roman galleries in Cătălina Monulești

The gallery complex of Cătălina Monulești is located in the Historic Centre Protected Area (total area of 137 hectares). In the 19th century, it was in the gallery complex of Cătălina Monulești that the largest batch of wax tablets from Roșia Montană were discovered (11 of 28). From 2001 to 2008, works were carried out in order to reopen the Cătălina Monulești complex, by securing 390 metres of galleries, 200 of which are from Roman times. Research has uncovered galleries from Roman, medieval and modern times. Apart from the 200 m of Roman galleries, there is evidence of possible chambers with hydraulic wheels for draining off waters, and of CORANDA cave mining works (large chambers) from medieval and modern times. In 2004, at the proposal of the National Archeology Commission, the Ministry of Culture and National Patrimony classified the gallery as a historical monument. Research and reopening works in the Cătălina Monulești galleries are still being carried out.

The CTA team visited the accessible galleries, which were opened as a result of the archaeological research financed by the project holder.

Research continues in the attempt to discover the initial entrance to the gallery, which was opened in Roman times.

Sensitive receptors

The Roșia brook

As mentioned above, the Roșia brook is heavily influenced by the anthropogenic activities conducted here, beginning with the first mining works of the Romans. Acid waters resulting from sulphuric ores that are exposed to external factors are collected in the underground via the gallery network and are discharged uncontrolledly in Roșia Valley.

[Images]

IV Identification of the target (potentially interested) public and of efficient ways to inform them

The target group was identified at the time of the first visit to the site. The EIA documentation and the updates formulated, as well as information regarding the mining project of Roșia Montană – the technical report, the evaluation report regarding the impact on the environment, studies and expert surveys, the security report, the public's comments and remarks, the reply of the project holder (SC Roșia Montana Gold Corporation SA) to each question from the public, the schedule of the impact evaluation procedure,



etc. can be viewed by anyone on the site of the Ministry of Environment and Forests on the following website: http://www.mmediu.ro/protectia_mediului/rosia_montana/rosia_montana.htm.

Impact on the population

Resettlement and relocation of the people living on the footprint of the project.

RMGC built a neighbourhood in the city of Alba Iulia – the Recea neighbourhood, with over 100 houses for the families who chose to be resettled in Alba Iulia. The project aims to build 200 individual homes.

For those families who wish to resettle in the proximity, RMGC planned to build homes and an administrative centre in Gura Roşiei (Piatra Albă).

Part of the families chose to receive money for the property ceded and to relocate on their own.

A number of owners have not yet chosen any of the options proposed by the project holder.

The historic centre of the commune and the adjacent households will remain on the current location.

V. Possibilities to supply utilities and description of the potential impact of such utilities on the environment, as applicable

1. Water supply

Water will be supplied from a surface source: Arieş River.

Water will be supplied from a single water source, namely Arieş River. Beside the water from Arieş, the technological process will also use neutralised acid water from the Cetate pond for acid waters and recirculated water from the Valea Corna pond, as described below.

2. Management of contaminated waters

Any potentially acid surface water leaking from heaps, access roads and underground mining works will be collected in the Cetate pond for acid waters, from where they will be pumped to the plant and treated in the acid waters treatment facility.


Treated waters will be used either in the technological flow for processing the ore, from where they will be transported to the Valea Corna pond, or will be discharged into Roşia Brook (only if they meet the conditions imposed by the regulation documents). Up to 85% of the waters drained into the pond will be recirculated and used in the technological flow.

Possible exfiltrations through the dam will be collected by the secondary retention system and pumped back into the pond.

A system of semi-passive treatment composed of three lagoons will be built behind the Roşia Valley dam and another one behind the secondary retention dam in Corna Valley; afterwards, the water will be discharged in the receptor river (provided that the legal provisions are complied with).

Wastewater will be discharged together with the tailings in the pond which is proposed to be built in Corna Valley, after previously being rendered innocuous. The Ministry of the Environment and Forests has required that the processing waste should have a cyanide contents of max. 3 ppm when discharged into the pond.

L. Elenca



A semi-passive treatment system consisting of three lagoons will be built behind the Valea Roșia dam and another one behind the second dam in Corna Valley..

3. Heating system

On the site of the processing plant, a heating plant functioning on liquid petroleum gas (LPG) will be built.

4. Waste management

For mining waste (barren rock), the project proposes for 2 heaps to be constructed: Cetate and Carnic.

As of the 10th year of mining, the Carnic quarry will be refilled with waste rock generated by the Orlea, Jig and Cetate quarries.

The Cetate quarry will be filled with waste rock on its southern edge, for reinforcement purposes. The Orlea and Jig quarries will be filled with waste rock from Cetate between the 12th and the 14th year.

For the tailings generated by the technological process of the plant, a pond and the related dam is proposed to be built in the Corna Brook valley.

A household waste deposit will also be built on the proposed site of the project, namely on the site of the plant.

VI Conclusions:

- ✓ On the site of the project there are 18 heaps of waste rock from previous mining works; they generate acid waters and must be rehabilitated.
- ✓ According to the information supplied by the project holder during the visit, in Corna Valley the bedrock consists of cretaceous flysch covered by a layer of clay (colluvium) and soil.
- ✓ From Cârnic we could see the Cetate quarry as well. In the two quarries, open cast mining was carried out by the state company Roșiamin; those works were abandoned (in 2004 for the Cârnic quarry and in 2006 for the Cetate quarry), therefore we could notice the abandonment and degradation of the quarries. Because of this, it is necessary to start ecological reconstruction and site rehabilitation works.
- ✓ In the Corna Valley, on the site of the future pond, two excavations were performed that proved the existence of the clay (colluvium) layer that makes a natural lining for the valley.
- ✓ The fissured aquifer in the cretaceous deposits in the area of the future pond can be contaminated by dangerous substances if the pond is not correctly waterproofed. It is necessary to compact the colluvium in the pond basin. A strict programme is required to ensure and control quality. Such programme will include: observing and testing the materials before compacting them and performing the compacting according to the arrangement of the material in the compacting area.
- ✓ The TAC team has noticed vegetation growing on part of the land that corresponds to the project. According to the project holder, (about 20% of) it is included in the National Forest Fund.



Laura Elena

- ✓ During our visit to Corna Valley, we noticed isolated constructions overlapping the footprint of the pond.
- ✓ At Gallery 714, it was discovered that the waste water from the underground is discharged into Roşia Brook. It was there that we were introduced to one of the (nano-filtration) treatment technologies for treating the acid mining waters of Roşia Montană that were tested at laboratory scale.
- ✓ The Tăul Găuri funerary monument – we noticed that measures have been taken for its protection and primary conservation in situ.
- ✓ The gallery complex of Cătălina Monuleşti – following our visit to the underground, we noticed that the clearing and research works carried out by French archaeologists and geologists from the Cluj University are continuing.

VII Contact person / responsible for environmental protection on the part of the project holder

General Manager: Dragoş TĂNASE
Vice-President Environment: Horea AVRAM

VIII Signatures

President of the Technical Analysis Committee
Secretary of State
Marin ANTON

[Illegible signature]

Representative of the project holder:
Name: Dragoş TĂNASE – General Manager
Signature: *[Illegible signature]*

Name: Horea AVRAM – Vice-President Environment
Signature: *[Illegible signature]*

.....

I, Elencu Laura-Daniela, holder of authorization no. 7626/2005 issued by the Ministry of Justice, hereby state that I am a certified translator between the Romanian language and English and that the official Romanian document presented to me has been accurately translated from Romanian into English to the best of my knowledge.

Translator,

[Signature]

