3/2016

Euromines
External Newsletter

November 2016

Sustainability of Mineral Resources and the Environment

European Association of Mining Industries, Metal Ores & Industrial Minerals

Editorial

We very much appreciate this year's conference under the Slovak Presidency of the European Union show-casing achievements and challenges of the extractive sector in managing its sites and the land in a sustainable way.

Protection of the environment remains one of the key issues for the sustainable management of any mine or quarry site. Advances in technology and management techniques continuously improve the industry's performance. However, working with the environment also means keeping these technologies and methods alive to local, often changing, environmental conditions. This require continuous research, learning and adjustment to obtain the best possible results.

The extractive industry over the past two decades has come a long way toward making its sites cleaner and more sustainable. The contributions hereafter demonstrate a small but typical range of activities in the sector.

See you in Bratislava!

Corina Hebestreit

EIT RawMaterials 3/2016

EIT RawMaterials, a New European Initiative in Raw Materials

Dr. Karen Hanghøj
EIT RawMaterials GmbH

The European Institute of Innovation and Technology (EIT) has supported a Knowledge Innovation Community (KIC) on Raw Materials. This KIC, EIT RawMaterials is committed to increasing innovation capacity, competitiveness, and sustainable growth in Europe in the area of raw materials, and does so by strengthening collaboration across the entire value chain, from exploration to recycling.

EIT RawMaterials has the vision of turning the challenge of raw materials dependence into a strength for Europe. Its mission is to boost the competitiveness, growth, and attractiveness of the European raw materials sector via radical innovation and entrepreneurship.

EIT Raw Materials will integrate multiple disciplines, diversity, and complementarity along the three sides of the knowledge triangle (research, industry, and education), and across the whole raw materials value chain. The KIC consortium consists of more than a hundred partners from all parts of the value chain. The operational implementation takes place in six regional hubs jointly delivering Europe-wide coverage and providing a strong basis for global cooperation.

The three strategic objectives of EIT RawMaterials are, 1. **Securing raw materials supply**, 2. **Designing solutions,** 3. **Closing material loops**. To achieve these goals and secure an economically viable and sustainable raw materials supply, a range of options must be developed. Mining must be strengthened in Europe as well as in the Artic and from the seabed. Raw materials supply from secondary sources must be increased through innovations in recycling, extraction from industrial residues, tailings, and urban and landfill mining. The involvement of EIT RawMaterials partners in the global system of trade and governance of raw materials must be reinforced. The activities carried out by EIT RawMaterials include **Matchmaking and Networking, Education, Validation and Acceleration,** and **Business creation and Support.** These cover six main knowledge and innovation themes along the value chain:

1. Exploration and raw materials resource assessment
2. Mining in challenging environments
3. Increased resource efficiency in mineral and metallurgical processes
4. Recycling and material chain optimisation for End-of-Life products
5. Substitution of critical and toxic materials in products and for optimised performance
6. Design of products and services for the circular economy

EIT Raw Materials expects to generate significant impact on European competitiveness and employment. This will be realised through the introduction of innovative and sustainable products, processes and services, and through focus on education in raw materials related fields. Educational activities will span from graduate courses through life-long learning programmes to wider society learning. They will prioritise industry involvement and entrepreneurial skills leading to well-educated T-shaped professionals that will deliver increased economic, environmental, and social sustainability to European society.

2016 was EIT RawMaterials first operational year, where several activities started up. In 2017 there will already be more than 150 projects running covering all activity types and all themes.

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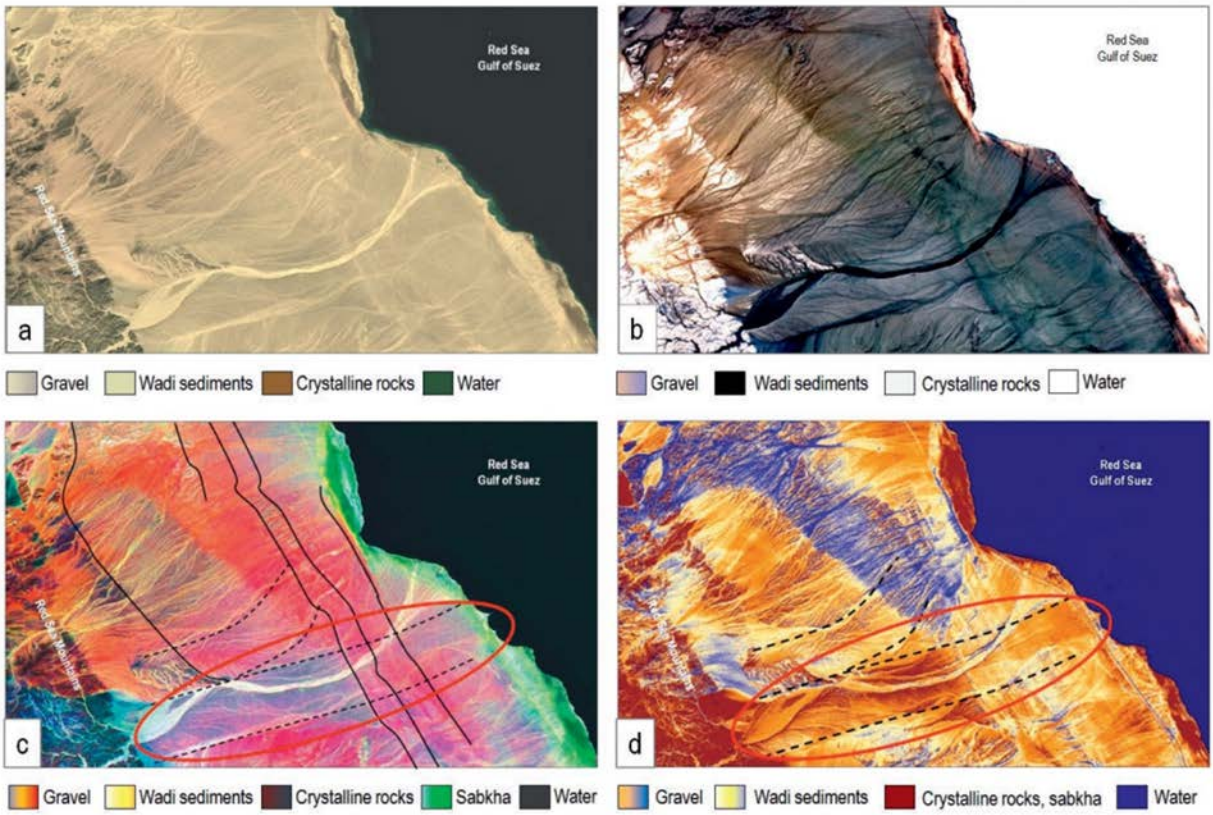
EIT RawMaterials is supported by the EIT, a body of the European Union

The EU Copernicus Programme and the Raw Materials Sector

Geoff Sawyer
EARSC

Copernicus is a major European programme with the goal to improve global monitoring for the environment and security. Images from Sentinel satellites are generating vast volumes of data which is being turned into geo-information by 6 dedicated Copernicus Services. How can the mining and raw materials sector benefit from the use of this European asset?

At a recent meeting organised by the European Commission, EARSC and Euromines discussed this question. It was agreed that benefits could be significant and that we should make some joint proposals to the Commission as the two representative bodies (Euromines and EARSC) working together can provide an excellent basis from which to identify suitable actions.



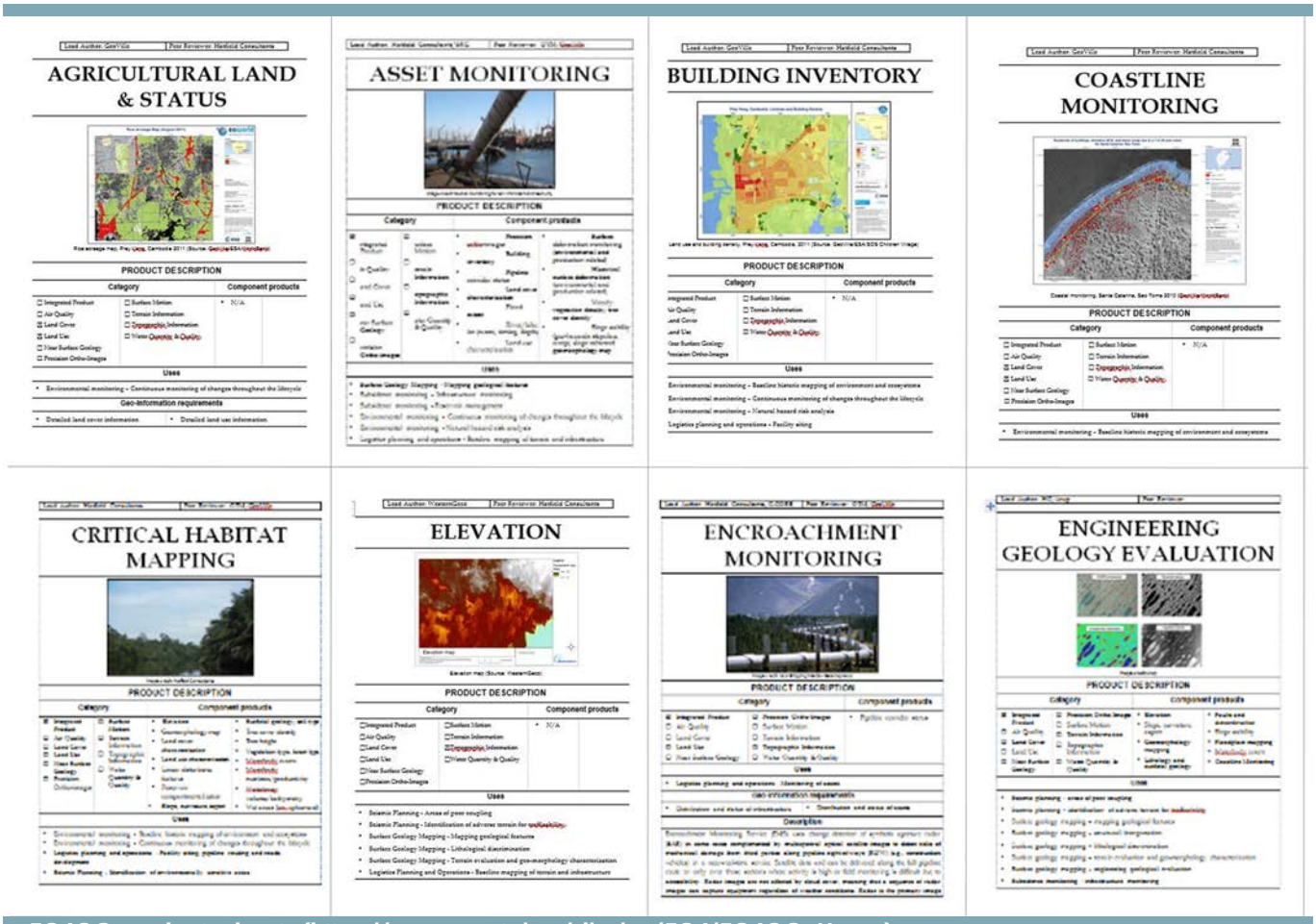
Satellite image processing for structural geology: a – conventional Landsat 321 RGB, b – inverted Landsat 321 RGB, c - high discrimination lithology image, d – wadi map © OTM and WestrenGeco

The EU Copernicus Programme 3/2016

Imagery taken from satellites benefits us in many ways, but for many years, the limited number of very expensive satellites has made imagery expensive and difficult to access. Now, more and more satellites are being launched, and as imagery is becoming much easier to access, attention shifts to the information which it can provide. Furthermore, data coming from the public satellites like Copernicus is available on a free and open data policy which makes it even easier to develop new products and to deliver them in an efficient manner.

Previously surveillance was the almost exclusive domain of governments. Now lower cost satellites are democratising space and making imagery available to everyone. Big data technologies are in turn making it possible to process and distribute the information more easily and most importantly to enable the combination of many different data types. These data and information are serving citizens and businesses alike – as well as governments.

The mining and raw materials sector is no exception. EO services have been long used by mining and raw materials companies to help in exploration and to monitor what is happening in the environment around their operations. The ability to gather this information quickly and accurately gives the possibility to transform business in ways which we are only just starting to understand.
In the past, products have been bespoke, i.e. each one developed for one customer. This is expensive. Now, with more and more data sources, we are seeing the emergence of on-line products and services which serve many customers. This new paradigm (for the sector) is set to transform the way companies work and how consumers can obtain information on their environment.



EO4OG products sheets (https://earsc-portal.eu/display/EO4/EO4OG+Home)

The EU Copernicus Programme 3/2016

Types of products used by the mining sector have been land surface cover maps in conjunction with geological surveys to prospect mineral deposits, maps of remote infrastructure (roads, water, landing strips etc) necessary to support mine development, environmental monitoring of water catchment areas, rivers and vegetation to detect any pollution or its extent, and sensitive biological sites as well as other habitats to meet regulatory requirements.

A few years ago, EARSC started working with the International Oil & Gas producers association following a workshop organised by the European Space Agency (ESA). This led to the creation of a group called OGEO where experts from the EO sector meet regularly with oil and gas experts. This led to a comprehensive study which identified 230 challenges (or problems) which the oil and gas companies face and which may be addressed at least partially through the use of satellite imagery. 92 EO products and services were identified which could be used to address these challenges. These can be found at a dedicated web-portal called EO4OG.

Many of the challenges for the mining sector are the same as those for O&G, and certainly many of the same EO products can benefit mining companies whether exploring or exploiting mineral resources. If EO service companies are to serve effectively sectors such as the mining and raw materials industry then knowing the sector needs becomes a must. We are setting the goal to construct a new Marketplace to help customers easily find the services they need. It will embrace high quality certified products as well as lower quality but cheaper ones. Service level agreements will be set out. One key will be meeting procurement rules of commercial companies (as well as governmental users), and another is the sustainability of a service where commitment will be needed if operations are to become dependent on information. Business intelligence is expected to become a growth area.

An on-line business model will also make use of big-data technologies to protect the IPR in data. This could mean yet another advance where data collected by companies as part of their operational processes can be monetised through its use in commercial services. Some data is too sensitive to open up for use by others, but a large part of it is not, and a new platform can make this a commercial possibility.

Working together, we should be able to explore these options and develop our understanding of what may be possible. Copernicus is real, it has been paid for out of our taxpayer funds, and we are enthusiastic about exploring its use to benefit both citizens and businesses such as the mining sector.

EARSC is the European Association of Remote Sensing Companies; a not-for-profit organisation founded in 1989 and based in Brussels. Currently, we have 85 member companies from 22 European countries covering the full value chain of activities from satellite operations and data delivery through value-adding and the delivery of geo-information. EARSC represents the Earth Observation services industry in Europe with a key objective to help companies develop their business. For more information, go to www.earsc.eu or contact info@earsc.org.

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Open cast mining activities

The EU Mining Montor Centre 3/2016

Enhancing Implementation and Capacities: The New EU Mining Mentor Centre and Its Objectives

Dr. Corina Hebestreit
Euromines

Waste from the extractive industry provides a challenge and an opportunity in times where the EU is committed to circular economy and wishes to secure access to raw materials in order to ensure its economic growth. It is therefore important that the EU continues to follow different avenues in order to improve its waste and land management. Resource efficiency needs to drive recovery of primary and secondary raw materials from extracted materials and old mine waste disposal sites, as well as end-of life products. Equally important, rehabilitation of old sites and application of modern techniques need to ensure the return of the land to society in an adequate condition for future use.

RTD and innovation into new techniques that achieve higher environmental, health, and safety protection has been and needs to be supported. In order to achieve better implementation across the EU, efforts needs to be made in capacity building of all concerned stakeholders.

The objective of the newly formed EU Mining Mentor Centre is to provide to the industry and other public and private stakeholders high quality expertise and support in the area of mine and quarry issues (as may be stipulated by EU or related national legislations). This includes environmental management, water management, material recovery for added-value, mine closure, and site remediation and aftercare, as well as expertise on social restructuring and retraining. Mine closure and site remediation is a long term and complex process. Not only the technical implementation, but also social and health impacts, safety regulations, specific legislative expertise, etc. are needed to be dealt with in this complex process.

The EU Mining Mentor Centre is capable of providing the necessary competences with a proven track-record of the experts involved.

The vision is to build a European Competence Centre that can give high quality support on these mine issues.

Its objectives are:

- To deliver high quality support on mine issues (as may be stipulated by EU or related national legislations) including environmental management, water management, material recovery for added-value, and mine closure and site remediation based on competences with a proven track-record of the experts involved.
- To deliver solutions for mine closure and site remediation which are long term and complex processes. Not only the technical implementation, but also social and health impacts, safety regulations, specific legislative expertise, etc. are needed to deal with in this complex process.
- The EU Mining Mentor Centre consists of a number of relevant and related experts who will cover the whole spectrum of issues and will provide training and consultancy services.

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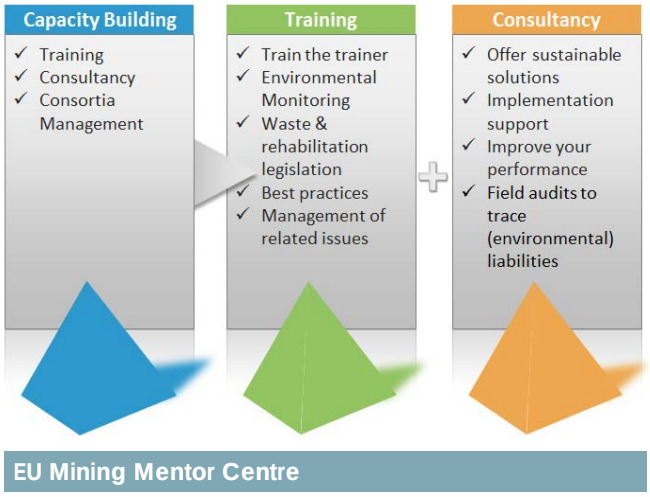

METALert

An Emergency Response System for Heavy Metals in the Environment

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1. Introduction

Accidental releases of heavy metals into the environment can have widespread and long-term impacts on environmental quality and on the health of humans and ecosystems. Therefore appropriate responses to emergency environmental incidents related to heavy metal pollution are necessary, and tools to forecast the impact of incidents are a prerequisite for this. METALert is a generic Emergency Response System (ERS) for accidental pollution incidents caused by key heavy metal related industries.

2. The METALert tool

The METALert tool is based on environmental models for forecasting, simulation and visualisation of dispersion of heavy metal pollution in water, air, and soil. The tool contains a generic database with typical emergencies in the key heavy metal related industries (at this moment this database is operational for China). Starting from an incident scenario, it can calculate the impact of an accident in water, air, and soil. It takes into account incident emissions as well as the effect of the legacy contamination present in a region.

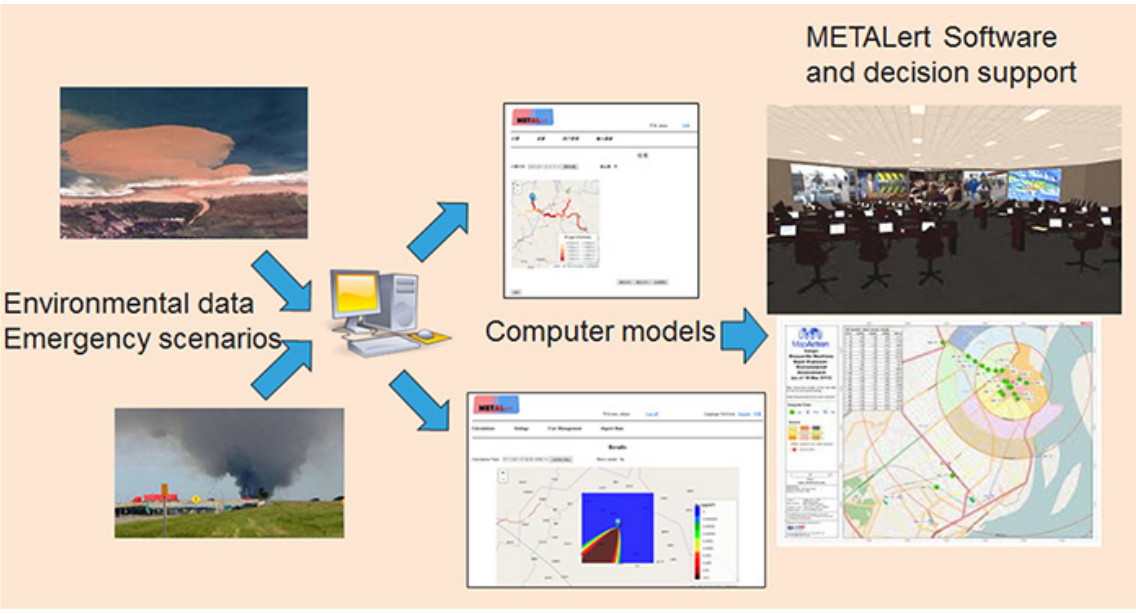

Figure 1: Scheme of the METALert system

The METALert tool for water calculates the discharge in the river with an adapted version of the LISFLOOD hydrological model and the propagation of the heavy metal plume in the river with the water quality model WASP. It takes into account the transport of the metal in surface water, sorption of the metals to sediment, and the resuspension and sedimentation of the river bed sediment.

METALert

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3. Application in China

The tool has been applied in several regions in China, a country with a very important heavy metal mining and smelting industry and the world top producer for many heavy metals. One of the study sites is a catchment located in the Hunan province, one of the main heavy metal producing regions in China. In the region, mining activities have been going on for centuries, and there is an extensive legacy contamination present in the rivers, soils, and sediments of the study catchment.

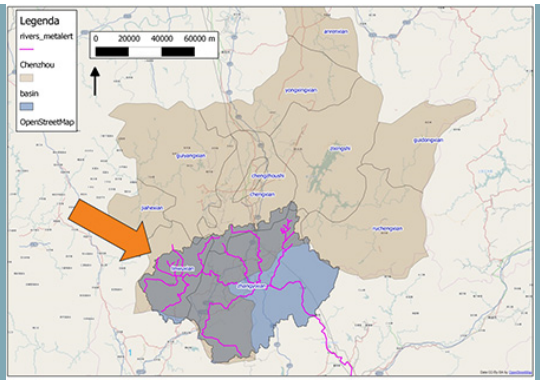
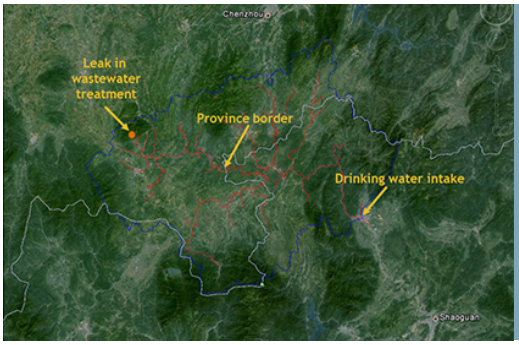


Figure 2: Tailing pond at smelter site in Chenzhou (left) and Wushui catchment in SE-China.

The tool has been set up for the Wushui catchment using a combination of world databases of land-use and topography and local data on meteo, river discharge, background concentrations of heavy metals in the region, and the location of historical mining sites. A simulation of an accident upstream in the catchment has been carried out, and the effect of an accidental discharge of Sb is evaluated at the location of the border between Hunan province and Guangdong province.



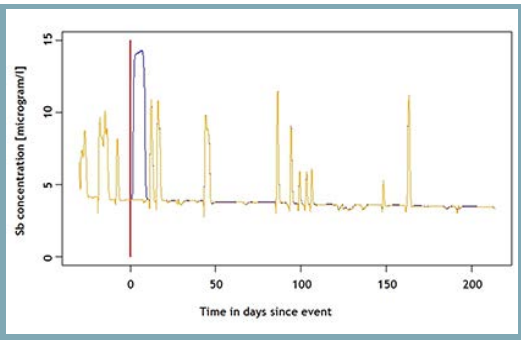


Figure 3: Location of accidental discharge, province border and catchment outlet (left) and calculated concentration of Sb at the province border with accidental release (blue line) and without accidental release (yellow line) (right).

Results show the effect of the accidental discharge on the concentrations in river water but also indicate the importance of the historical contamination in soils and sediments causing peaks of metal concentration after heavy rainfall from additional runoff to the river and the resuspension of river sediment into the water column.

4. Conclusions

The METALert tool can simulate the effect of an accidental release of heavy metals starting from accident scenarios and environmental data. METALert is flexible to be set-up for any mining area and can be used to prioritize actions in a region, guide monitoring strategies, and perform environmental impact assessments.

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Integrating Decommissioning and Environmental Remediation into the Life-Cycle Management of Mining and Milling Sites

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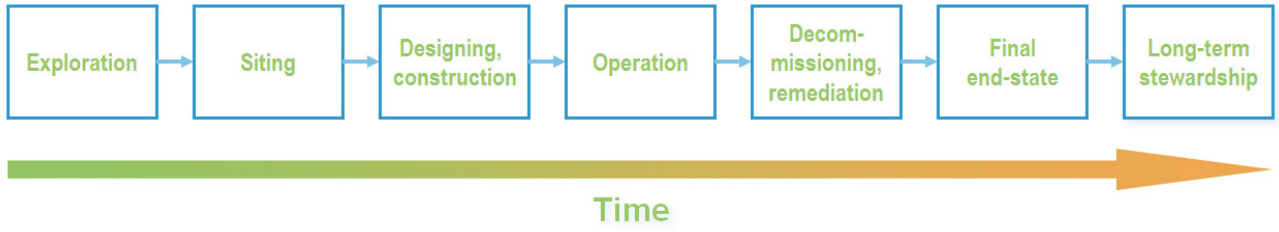
Modern mining takes a life-cycle approach that covers the temporal evolution of a site from exploration to the final end-state or re-use of a mining and milling site.

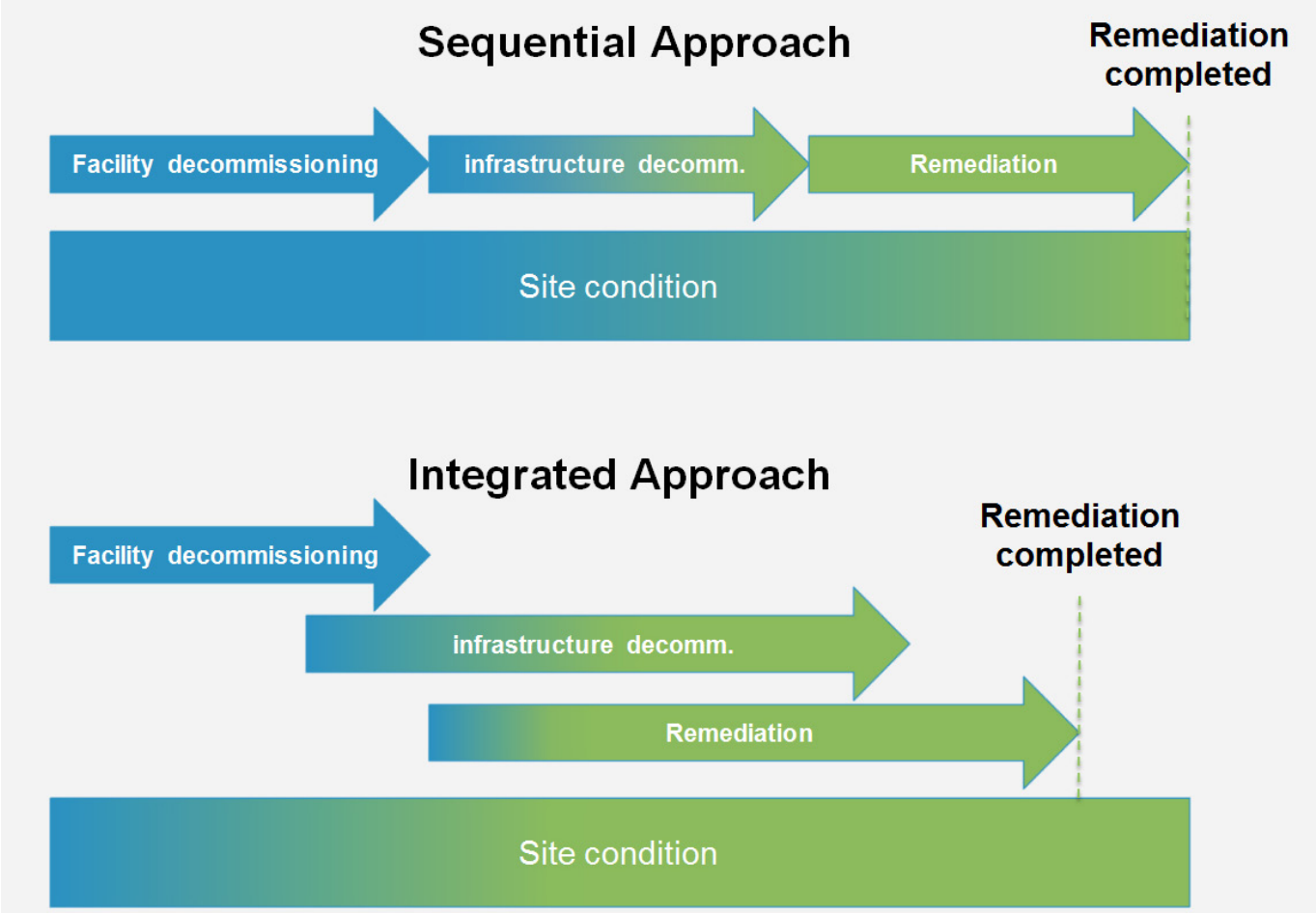


The life-cycle of a mining and milling facility

The picture the public has of mining today is still shaped by the past, when mining companies often exhibited a nonchalant attitude towards social and environmental impacts. Historically, this has its roots in a predominance of shareholder-value considerations, when the costs of environmental and social impacts were tacitly externalised. It has resulted in a large number of mining legacy sites world-wide, the remediation of which continues to require considerable (public) resources.
Mining and milling operations will permanently alter, to some degree at least, the site at which the operations take place but also their surroundings. A complete return to greenfield conditions will generally not be possible. Open cast mines, spoil heaps, and/or tailings management facilities will remain at the surface. Underground open mine workings will also remain. These features will eventually become mining and milling legacies with which the local population will have to live. A life-cycle approach to mine planning takes this into account and will also involve the local population in the planning and decision-finding processes for the future of such sites. A mining and milling operation should integrate into the local socio-economic context and add value to the host communities, if possible beyond its active life-time.
The classical engineering paradigm in residues management is to contain the alien material; in other words, to design for resistance. As a result, such structures, particularly above ground, have significant amounts of potential and chemical energy stored in them. According to the 2nd Law of Thermodynamics this energy will be dissipated over time. To counteract this process more energy has to be invested to maintain and repair mining and milling residues impoundments, possibly forever, requiring long-term stewardship.

When designing such impoundments it is, therefore, wise to minimise the amount of potential energy stored in them, for instance by going underground. Impoundments are often designed with only the operational requirements in mind, not considering their long-term fate. This will require extensive remediation works at the time of the closure of a mine. Such works should not be left to the end, but impoundments should be prepared for long-term care during the operational phase, as and when they are not needed anymore.

Life-Cycle Management of Mining 3/2016

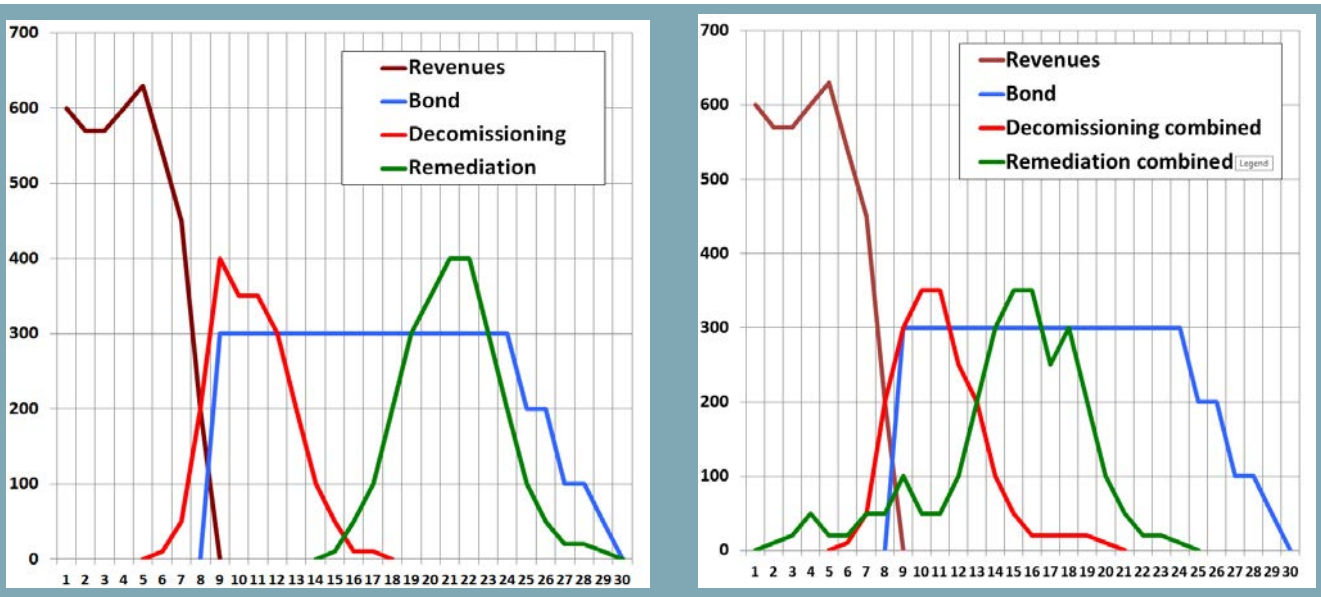


Integration of decommissioning and remediation

Decommissioning of above-ground and underground mine-infrastructure requires human and other resources, as well as knowledge. Once the mine is closed, both will become scarce rapidly. It is, therefore, wise to integrate decommissioning into the operational plan. Decommissioning and remediation work should be carried out as soon as infrastructure is deemed superfluous from the operations point of view. While it is appreciated that planning ahead for years, or decades in the case of mines exploiting large deposits, is difficult, it is wise to develop a mine-management plan that already includes a decommissioning plan. Buildings and other infrastructure can also be designed in ways to facilitate (partial) decommissioning. Undertaking decommissioning and environmental remediation as part of planned life-cycle management activities will create a variety of synergies, including:

- Financial synergies – will level out cost peaks and saves time
- Site assessment synergies – data are collected only once
- Risk management synergies – risks are understood over the whole life-cycle
- Materials and residue management synergies – segregated wastes can re-utilised in the project and residual wastes management together
- Occupational health & safety risk management synergies – many OHS risks are the same over the whole life-cycle
- Records management synergies – the same records support the whole life-cycle management
- Project management synergies – use the same resources and the same management systems

Life-Cycle Management of Mining 3/2016



Financial synergies and savings from integrating decommissioning and remediation

In the past, the need for decommissioning and remediation often was not considered adequately, resulting in difficult and expensive to manage legacies. Modern project planning for mining and milling sites covers the full life-cycle right from the start. Integrated life-cycle management shows a move away from the 'end-of-the-pipe' treatment paradigm. Life-cycle planning facilitates decommissioning and reduces the need for remediation. As a result, decommissioning and remediation costs can be fully internalised, and no unresolved problems are left to future generations. The end-state of a mining or milling site is fully understood and agreed upon from the beginning by all stakeholders.

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Mertainen Site

3/2016

LKAB´s Work with Compensation of Natural Resources for the Mertainen Site

Stina Eriksson
LKAB

Background and localization

LKAB is a high-tech supplier of iron ore pellets to the global steelmaking industry and a growing supplier of industrial minerals for other sectors. The business is built upon the unique magnetite ore, mined in the north of Sweden. Since the beginning of the 1900s, primarily three mining sites have dominated LKAB´s iron ore supply. In the year of 2014 however, LKAB received an environmental permit to start mining in a new additional open pit mining site called Mertainen.

Figure 1. The map shows the location of the mining site in the north of Sweden. The picture with the mine marked with a red arrow demonstrate the environments to be compensated.

Impacted area

The Mertainen mine will affect approximately 1 220 hectares of land. About 460 hectares of this have been categorized as direct impact zones – areas that will be logged and landfilled. 230 hectares is categorized as medium impact zones and 410 hectares as low impact zones. Both medium and low impact areas are, in various degrees, indirectly affected by mostly noise and dust from ongoing activity.
Several biodiversity surveys were initially conducted in the area. Based on the results, three different biodiversity condition classes and four habitat types were identified and mapped (figure 2).

Mertainen Site

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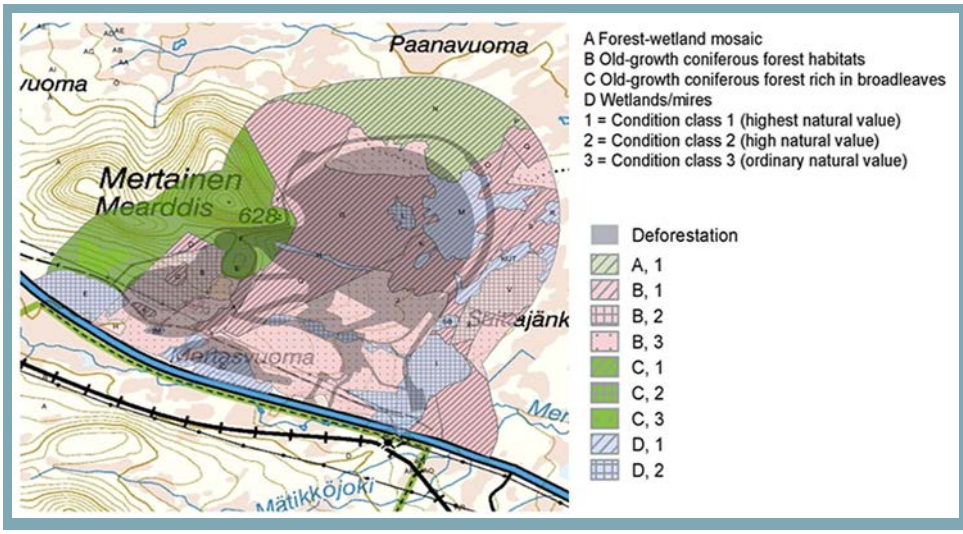

Figure 2. Map of condition classes and habitat types at the mining site. Darker shaded areas correspond to direct impact zones, non-shaded areas correspond to medium and low impact zones.

The compensation

To compensate for loss of biodiversity, LKAB developed a compensation plan for offsetting residual values in accordance with the mitigation hierarchy. The plan was consistent both with the conditions of the permit and LKAB´s land-use guidelines and was based on the Business and Biodiversity Offsets Programme (BBOP) guidelines. The Mertainen project was also used as a case in a VINNOVA-funded pilot project with Sveaskog, LKAB, and Enetjärn Nature AB to develop a methodology for calculating losses and gains. The project also investigated how new methods can stimulate the application of ecological compensation and develop into business for landowners. The project included a broad referent group with universities, companies, industry associations, and state representatives and received technical support from Forest Trends.

The chosen offset area, called Kuosajänkkä, is located north of Mertainen. It is located next to the mining site and therefore exhibits similar ecosystems and species diversity.

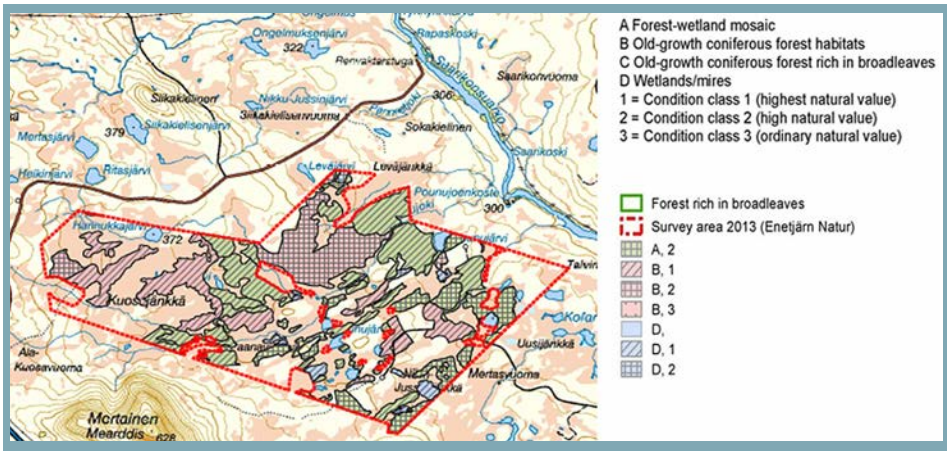

Figure 3 . Map of condition classes and habitat types at the compensation site. Map displays the closeness between the compensation area and the mining site.

The compensation program is a combination of 1) enhanced protection status from all exploitation - foremost from logging, for 50 years, and 2) conservation measures that will be implemented to create and raise existing values.

In the court hearing during the permit process, LKAB guaranteed that a minimum of 1200 hectares of highest or high natural value (condition class 1 and 2) would be included in the compensation program. In order to live up to the no net loss ambition stated in the company's land-use guidelines, and based on the methodology that the company developed during the project (see part -The quantification model), LKAB is today working with an offset area of approximately 2000 ha.

Mertainen Site

Conservation measures

The number of conservation measures that can improve the habitat condition and species richness in these types of forest habitats in northern Sweden are limited. Besides free development, LKAB has defined four different management measures.

1. Increasing the amount of dead wood in about 60 hectares of woodland. Dead wood is often scarce in human impacted areas due to selective cutting. The measure aims to improve the amount of available substrates for plant and animal species. The trees have been collected primarily from Mertainen with the hope of also moving species into the compensation area.
2. Mire haymaking is an example of historical land use practices that used to be a common part of living-conditions in the northern parts of Sweden. The measure could improve species diversity in selected wetlands in Kuosajänkkä, and LKAB will follow up how species diversity is affected.
3. To restore natural water flows and improve wetland conditions affected by human activity, wetland restoration will be made by filling ditches and tramlines with peat and moss.
4. Fires - just as dead wood - are a rare commodity in today's forestry, and through nature conservational burning (controlled burning), fire dependent plants and insects will be favoured.

The quantification model

The model chosen to best quantify the biodiversity values for this project was the Habitat-Hectares method. 'Habitat hectares' are a unit of measurement that takes into account both the area affected and the quality and condition of the biodiversity in said areas.

The quality is determined by the quantities of selected benchmark attributes, that in a representative way, reflect overall biodiversity which will be lost or gained.

Figure 4. Picture of Dead wood to be moved from the Mertainen mining site to the compensation area.

In forest habitats these were:

- Biodiverse trees
- Dead wood
- Continuity
- Number of red-listed fungi
- Number of red-listed lichen

In wetland habitats these were:

- Wetland heterogenity
- Wetland structures
- Rich wetland-indicators
  - o mosses
  - o vascular plants
- Number of redlisted species
- Mineral wealth
- Human impact

To ensures a reference point against which losses and gains can be quantified and compared consistently and transparently, a baseline/ reference dataset was collected. A number of reference sites, so called benchmark sites, were inventoried to gather data for the "best/highest possible condition" for each benchmark attribute.

The different habitat types in Mertainen and Kuosajänkkä were then plotted against the benchmark, and habitat-hectares for both areas were calculated. Separate calculations were made for each habitat type and condition-class. Also the amount of impact was weighed in.

The gains were estimated by comparing two scenarios for the compensation area: one with and one without compensatory measures for a time period of 50 years. The calculations include factors of uncertainty to take height for unpredictable events and uncertainty parameters.

The results from the calculations show a balance between losses and gains. For Mertainen a total of ca 450 'habitat-hectares' were lost, and in Kuosajänkkä a total of ca 480 'habitat-hectares' were gained, thus leaving the area with net gain.

A follow-up program has been designed to monitor the results from the conservation measures, which will give feedback to the preliminary expert estimations that were used in the model.

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Green Bridge Competition 3/2016

Green Bridge Competition – Examples of the Best Practices in the Rehabilitation of the Mining Sites in the Czech Republic

David Póč
Těžební unie

One of the key challenges for the mining industry in the Czech Republic is to show to the general public that places with mining history have a wide range of applications and do not become a negative factor in the development of the area. With appropriate regional management, a place previously known and referred to in negative connotations can be transformed into a geologically or biologically interesting site beneficial for the region. In 2006, the Czech Republic Mining Association (Těžební unie ČR) introduced a national competition called "Green Bridge." Its purpose from the very beginning was to present the best examples of creative and innovative solutions in the area on the mining sites rehabilitation.

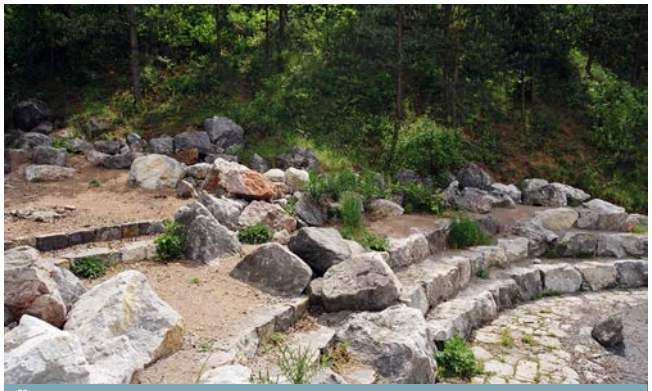
Interesting projects that have been introduced in the "Green Bridge" competition from 2006 onward:

Restoration and utilization of the mining site in Čebín – Dálky

Not far from Brno, the center of South Moravia Region, is the village of Čebín, which was known for decades for its large limestone quarry supplying material to a wide area. With the termination of mining activities, a question arose of how to use the mining site located in the region of the municipality. In addition to discussions about controlled succession and technical reclamation as a way to reach sustainability and usability of the site, a possibility of direct use by the local community was debated. On the basis of this impulse, a unique project originated which converted a part of the site into a natural amphitheater with significant potential for use in the form of theatrical and musical performances.

Use of reclaimed area of the Růženin lom quarry

The Růženin lom quarry, a significant landscape element, is a former pit quarry in which limestone was mined mainly in the first half of the 20th century. The Růženin lom quarry is undoubtedly a model example of the fact that mining activities can have a positive impact on biodiversity of the area. A strong, active spring was discovered in the quarry, and therefore the original plan to restore it by clinker ash landfill was changed. Instead, several water surfaces were created and their immediate surroundings populated by a number of plants and animals linked to water habitats. For example, there is a strong population of rare Epipactis palustris (marsh helleborine), a large population of aquatic insects, several species of fish, and even grass snake in the area. Apart from these, a number of rare thermophilic plant species migrated into the area from the surrounding steppe vegetation. For example, the only vestige of Artemisia pontica (roman wormwood) of the Hády area population can be found here.



Čebín – Dálky rehabilitation

Růženin lom rehabilitation

Green Bridge Competition 3/2016

Rehabilitation of a sand pit in Tovačov and a creation of a unique fishing district

Mining of gravel sand has taken place around the village of Tovačov since the 20's of the last century in the places of quaternary sediments of the Morava River. In total, there are four lakes where there is still active extraction of gravel sand. The basis for technical and biological rehabilitation is set on the necessity of its gradual implementation in the individual parts of the lakes. The rehabilitation consists mainly in sloping the lake shores, grassing the slopes, or planting wood plants there. The planting of wood plants takes place also in other areas affected by the excavation, or conditions are created for a spontaneous oecesis of invasive plants. Materials that are originated in the treatment of gravels sand are used for the formation of sand banks and wetlands. Large parts of the lakes are included at present to the locality of European significance in the NATURA 2000 system.

A fishing territory is determined in all the lakes. Due to significant aquiculture interests in the whole territory of the Tovačov lakes, the controlled recreation activities take place mainly in the part of the area of the lake Tovačov IV and Tovačov III (Yacht club activities, sport fishing).

Conclusion

From the above examples, it is evident that both active and former excavation premises in the Czech Republic still need to diversify more types of the rehabilitations performed, providing that they should first of all meet the specific local conditions. Upon the planning of rehabilitations, the mining organizations more and more often unite with the representatives of local organizations or non-profit organizations not to obtain the results of the rehabilitation activities that are „only" technically correct, but mainly to fulfil a specific objective for which the rehabilitation was intended.

From the above examples, it is evident that the rehabilitation works also take place in a close cooperation between the investor – the mining organization – on the one side and architects, representatives of the local community or non-profit organizations on the other side. This is also in the Czech Republic one of the few ways of bridging the mistrust of the mainly non-professional public toward mining activities with respect to concerns about not only the excavation itself, but also the consequences that remain after it. Proactive and responsive approach of mining companies to the problem of further use of the mining areas these days clearly shows the support of the „Corporate Social Responsibility" element of undertaking, which is connected with a modern mining industry. The situation in the Czech Republic also shows that in the countries of the former „communist bloc," the mining industry made a large step forward in the approach to the environment and communication with local communities.

The main challenge is now to further continue in active communication with the local communities, with the aim to define a suitable designation for the exploitation of the mining localities after a full or partial termination of the excavation activities in the mining areas. A significant asset for these possibilities is a support of exchange of the best accessible practices in the form of various information platforms (for instance, the European association Euromines) or contests promoting rehabilitations in compliance with the intentions of the local communities (e.g. the Green Bridge of the Mining union of the Czech Republic).

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Tovačov sand pit area

3/2016

Euromines

Euromines is the recognized representative of the European metals and minerals mining industry. The members' main objective is to promote the industry and maintain their relations with European institutions at all levels. Euromines provides services to its members with regard to EU policy and forms a network for cooperation and the exchange of information throughout the sector within Europe. The association also supports contacts with the mining community throughout the world.

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