



## WHITE PAPER ON RESPONSIBLE MINING

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### **Preamble**

Modern societies are dependent on mineral-based products. Energy technology, Information and communications technology, consumer electronics, infrastructure, logistics and food production all increasingly rely on an ever-widening array of minerals and metals. For example, production of a personal computer or a smartphone needs over 40 elements. Rapid replacement of internal combustion engines by electricity based technology in the car industry and widening application of wind and solar energy may cause a massive demand for mining of metals such as, lithium, cobalt and rare earth elements. The use of many of these hi-tech metals will vastly increase quantities in the future, and mining of primary resources is the only way to produce them. Minerals also provide the materials to build homes, schools, hospitals and infrastructure. Minerals and metals are essential for generating and supplying “renewable” «green» energy and low-carbon production technology. Even wind generation requires huge amounts of traditional minerals and metals including aggregates for their concrete anchorage, copper for the motor windings and transmission cables and aluminum for their construction material. Minerals and metals are also fundamental to make societies more resilient to climate change because of their use in the technologies mentioned earlier.

Mineral and metal consumption strongly correlates with economic growth and urbanization. Three billion additional people will likely move to cities by 2050. Improved recycling, resource efficiency, better product design and new materials will reduce mineral and metal consumption per capita, but mining of primary resources will continue to play an important role in the future in building sustainable societies.

Geology defines the occurrence of mineral deposits so mining is geographically constrained, but the use of the products of mining in down-stream industries or as final products often takes place in continents and countries different from the location of the mine. Therefore, mining communities do not necessarily appreciate the importance of mineral production for the welfare of people living in other countries, particularly if there is no tangible sharing of those benefits.

Mining cannot choose locations that are logistically, socially, environmentally or politically optimal, appropriate or ‘friendly’. This means that companies may have to deal with circumstances that could pose ethical challenges including: the relationship with local communities, position in the landscape/environment, relationship with local and national governments, weak governance and associated increased risk of corruption and bribery. It is necessary to deal with these challenges in a responsible way. This also means that geoscientists and engineers will need to build their capacity and skills on how to deal with local communities and related social issues.

There is no doubt that mining can bring positive benefits to the host countries but these can come at a cost to the environment and local communities if relationships, resources and operations are not managed properly. The fundamental aim must be equitable distribution of the benefits of development and minimization of the negative impacts on people and the environment. Responsibly navigating this field requires a strong ethical compass.

## **Introduction**

Mining often takes place in remote, less developed areas and can provide great opportunities for local development. Wealth generated by mining has the potential to improve the economy, infrastructure and quality of life of the host country, region and community, and brings opportunities for economic growth and diversification. Mining generates revenue for governments through royalty and tax income. It also provides both skilled and unskilled employment, technology transfer and training for people, together with further jobs through economic and social multiplier effects. Mining can bring substantial improvements in physical, social, legal and financial infrastructure. Realization of mining's contribution to the United Nations Sustainable Development Goals (SDGs) requires deliberate and sustained effort. If not properly managed, economic growth and development can come at an unacceptable social and environmental cost. While mining has historically affected its surrounding environment, advances in technology, and improved management techniques and methods make it possible to reduce, even drastically, many negative impacts and thus facilitate a change in the negative perception of the public toward mining activities. The mining cycle consists of the stages public good geoscience studies; prospecting and staking; early stage exploration; advanced exploration and development; construction; exploitation; and closure. Increasingly, mining companies are making efforts to reduce the environmental impact of mining and to minimize the footprint of their activities throughout the mining cycle, including rehabilitation of land and ecosystems after mine closure and dealing with the social aspects of closure. Dialogue between the mining companies and people in the local communities is essential from early exploration to mine closure. Mining companies should build and maintain ongoing productive relationships with surrounding communities through transparency and open dialogue, using best available practices, operating in harmony with other land uses, decreasing water usage, energy intensity and environmental footprint to assure an ethical approach while interacting with the Earth system. Governments should also enhance transparency, provide a stable legal framework, implement policies to share the financial benefits of mining with local communities and the host countries, promote long-term investment in geological surveys as a social commitment and promote mineral exploration to find new resources for future needs.

## **Definition of Responsible Mining**

Responsible mining demonstrably respects and protects the interests of all stakeholders, human health and the environment, and contributes discernibly and fairly to broad economic development of the producing country and to benefit local communities, while embracing best international practices and upholding the rule of law.

## **Purpose of this document**

This document intends to provide essential reference elements for framing this important topic from an ethical perspective and to draw geoscientists', companies', policy makers' and society's attention to the ideas and approaches that the actors involved in mining have developed and use. It thereby illustrates the need for geoethics and, for those working in this field it shows areas in which they can put the values enunciated in the "Cape Town Statement on Geoethics" into practice. This document summarizes the results of an extensive survey of relevant literature. The bibliography lists relevant source documents.

## **Best Practices for Responsible Mining**

When developing and implementing responsible mining practices, consider the following practices and applicable guidelines:

- 1) Identify and engage all relevant actors (stakeholders), including authorities, community members, employees, contractors and non-government organizations. Maximize contribution to sustainable development, manage and mitigate any environmental risks and impacts, better understand and meet the expectations and needs of society and the political situation, assess social impacts and opportunities, conduct social baseline studies, ensure good governance and maintain high standards of ethics. The latter includes steering clear of bribery and corruption, both of which can have a nefarious impact on community development, company reputation and mining operations and, in a wider context, on the functioning of democracy. Bribery and corruption are global problems and complicity is not specific to developing nations.
- 2) Conduct open, inclusive and continuing dialogue with local communities throughout the mining cycle, to create strong, transparent, trusting, collaborative and lasting relationships. Pay particular attention

to human rights and respect for local culture and cultural heritage, access to land and water, and issues related to employment, security, public procurement, diversity, integrity, and gender equality. The main intent is to establish long-term well-being and sustainable development of local communities that continues after mine closure.

- 3) Engage with communities and stakeholders and identify areas in which there is reasonable alignment of values (implicitly both economic and moral). Look for opportunities for collaborative action that will create sustainable benefit for all parties, while respecting local cultural values. Aim to make a significant contribution to the local, regional and national economies and to positive and stable social structures. This local employment and procurement may have a strong and resilient economic effect throughout the entire value chain. Appropriate and resilient social structures will contribute to good local governance and community development Governments would share the value created through taxes and investment opportunities for local communities.
- 4) Protect the environment and minimize or mitigate any environmental impacts on people and communities, including on the use of resources such as energy, water, and productive soils. Commit plan for securing water availability, maximizing water recycling and minimizing fresh water intake, eliminating uncontrolled water discharge, understanding the water-soil interplay and preventing water contamination by implementing new technologies and innovative processes. Also, minimize noise and dust emissions, and prevent land use conflicts. In this respect, actors should take into account the growing competition between land use, biodiversity and water resources.
- 5) Cooperate closely with regional and local stakeholders better to understand biodiversity and conservation issues, increase biodiversity awareness and thereby improve biodiversity and natural resource management practices. This helps minimize biodiversity loss and habitat degradation and land disturbance by mining, along with other increases in sensitivities of adjacent ecosystems may occur.
- 6) Acknowledge the possibility that, when a project does not meet basic environmental and social criteria for acceptance building and operating a mine is not the 'right' outcome.
- 7) Promote energy savings and increase the use of renewable energy sources such as solar panels and wind to reduce carbon dioxide emissions. As mining is a major energy user, it needs to develop new technologies to improve its energy efficiency. Essentially, certain minerals and metals are components of these new technologies and therefore critical to fast progress of the ongoing energy transition towards a low-carbon society.
- 8) Manage waste in an efficient and safe way, by improving its transportation and tailings management, preventing any environmental contamination, and reusing waste as possible. In this respect, always consider waste as a potential secondary resource. Mining should aim to recover all valuable metals and minimize waste.
- 9) Plan closure and rehabilitation based on environmentally and socially sustainable standard elements and management systems. Take into account future planning in relation to re-development and new potential uses of the restored land. Closure of a mine requires functional and tested technical and scientific methods, so that the restoration of quarries, tailings, waste areas and infrastructure allows further sustainable use of the area according to plans. Mine closure has a major impact on surrounding communities and planning for the social and economic aspects of the transition should start well in advance. Possible approaches include support of economic diversification and creation of alternate livelihoods, capacity building, professional training, and others. Part of the wealth generated by mining should serve as a catalyst for sustainable development of the communities. All actors involved should anticipate the accompanying changes to the social fabric and manage these as well as possible.
- 10) Conduct tailor-made and fit-to-purpose research to develop technology innovations and advanced methodologies addressing exploration and extraction of mineral resources in a responsible manner to reduce potential negative environmental impacts.
- 11) Guarantee access to conflict-free minerals by exploring for potential sources of these minerals outside active conflict zones, or replacing conflict minerals (such as the chemically similar "high-tech" elements niobium, tantalum, and cobalt with ethically and locally produced ones). Raise the societal and ethical issues involved, and consider improving conditions of producing operations globally. While legislation, both within the European Union (EU) and the USA, is now being enforced to "guarantee" conflict-free

niobium, tantalum, and cobalt in industrial products, there still are major caveats associated with the situation.

- 12) Provide a safe and healthy work environment for all employees, and contribute to the health and safety of surrounding communities. Within the company, organize work in such a way that it is safe and meaningful to employees. Automating certain processes and making them more efficient, as well as developing new practices and working methods in cooperation with the entire staff can help achieve this goal. The need for strict health and safety standards and practices is self-evident, as is education aimed at a good work culture. Occupational safety aiming at zero accidents is an important goal in all development. Assure a respectful and fruitful working environment by eliminating harassment and discrimination based on race, gender, religion or nationality.
- 13) Educate students on the importance of effectively managing mineral resources as well as protecting the environment and assuming social responsibility, and provide training/coaching in the practice of engagement with communities and other stakeholders', to graduate highly skilled and ethically responsible geologists, mining engineers and environment professionals.

### **Additional aspects**

A recent Atlas published under the United Nations Development Program showed that mining could contribute to each of the United Nations Sustainable Development Goals (SDGs). This requires that companies: (i) include the selected SDGs in their main activities, (ii) clearly state what they are prepared to do, (iii) avoid providing social services that are the responsibility of the government and (iv) work together with all actors involved. Some examples of contributions companies can make are dialogue and commitment to work with all parties involved; participation in sustainable development initiatives; using their ability to convene; and planning processes.

Deep-sea mining is a relatively new field and practical implementation of the principles of responsible mining outlined earlier will probably require considerable thought and experimentation. The types of social and environmental issues raised by deep sea mining are quite different from those related to mining activities on land, and the long term impact of deep-sea mining deserves to be carefully discussed and scientifically approached.

The aspects of responsible mining described above refer to modern industrial mineral exploration and mining. However, artisanal and small-scale mining provide a livelihood to millions of (mostly poor) people worldwide, use primitive methods that often cause severe environmental damage and pose huge risks to health (mainly because of the use of mercury), and produce up to 20% of world gold production and 80% of gem production. The challenges involved in making this type of mining more responsible include poverty, weak states, social issues, and lack of education and infrastructure. Many governments are trying to address the situation, and a number of industrial mining companies contribute by working with organizations of small miners allowing them to work on part of the company's concession and by providing technical and educational support. Artisanal and small-scale mining can be compatible with large mining operations. Providing training, access to technology and enhancing the overall governance of raw materials should be a joint effort of governments, miners and local populations.

### **Conclusions**

Responsible mining concerns the principles and ethics of sustainable development applied to the exploration for and exploitation and use of economic mineral resources, including the entire value chain, from studies, exploration, and extraction to processing, refining, waste management, mine closure and rehabilitation. In particular:

- It is about concrete commitment to managing the economic, social and environmental challenges related to mineral resources development, to build a system capable of ensuring/promoting responsible extraction of minerals and developing a proper alignment of the corresponding benefits at local, regional, national and global scales.
- It is about how to build trusting and transparent relationships with society in general and with the actors more directly involved that allow a fruitful involvement of local communities and government authorities in the creation of sustainable benefit for all parties.
- It is a way to minimize and mitigate environmental impacts related to water, biodiversity and land.

- It meets and tackles climate change issues through implementation of innovative technologies across the value chain, but also by producing the supplies of minerals and metals needed in low-carbon energy systems.

For this to happen an open communications strategy along with engagement of all relevant actors is necessary.

The principles expressed through the “Cape Town Statement on Geoethics” are essential for responsible mining. It is clear that there is the expectation that any geoscientist, working in this area will make her or his responsible contribution. The world needs an ever-greater variety and quantity of minerals, the production of which can be very damaging to people and the environment. However, with proper controls, ethics and regulation these negatives can be minimized and the positives, such as development maximized. However, that mining companies do require financial and regulatory stability and access to geodata to achieve these goals.

Responsible mining does not only require actions and commitments from mining companies, but is likewise dependent on the active and constructive engagement and involvement of all actors (including governments). They all have a responsibility to be well informed, transparently updated and fully aware of all aspects of any mining activity that touches them in any way. Social and environmental responsibility is integral and rests on all actors involved.

### **Bibliography**

To formulate, establish and promote the values and standards for achieving responsible mining performance, in accordance to IAPG’s goals and mission, the authors consulted following global references (papers, reports, websites, etc.) of relevant frameworks and initiatives: <http://www.geoethics.org/wp-responsible-mining>

