

4. MINE CLOSURE - AN INTERNATIONAL OVERVIEW

4.1 Legal Provisions for Mine Closure

Mine closure presents a mixture of issues like: environmental, economic, social and development. Governments in various countries are now coming with one opinion that they have the responsibility for taking actions in order to provide successful mine closure that is well accepted by landowners, communities and the company. The above issues are all driven by policies and legislation that provide directly or indirectly for comprehensive mine closure and addressed differently with respect to countries.

In Australia, Canada, Europe, Japan and United States mining has been diverse in terms of mineral commodities and mixture of underground and opencast mines ranging from small to large scale. All Countries have developed policies and legislation with respect to mine closure.

In United States the Government have legislated:

- § The National Environmental Policy Act 1964.
- § The Clean Air Act 1970.
- § The Clean Water Act 1972.
- § The Resource Conservation and Recovery Act 1976.

In Western Australia, one also deals with legal liabilities relevant to aspects of the closure of operations. They are:

- § The Mining Act 1904.
- § The Mining Act 1978 (Tenement Conditions).
- § The State Agreement Acts.
- § The Environment Protection Act 1986 (Part IV and V).
- § The Mines Regulation Act 1946.
- § The Mines Safety and Inspection Regulations 1995.

Other state legislation that may be relevant / helping for the preparation of closure plans are:

- § The Wildlife Conservation Act 1950.
- § The Aboriginal Heritage Act 1972.

- § The Heritage of Western Australia Act 1990.
- § The Conservation and Land Management Act 1984.
- § The Rights in Water and Irrigation Act 1914.
- § The Soil and Land Conservation Act 1945.
- § The Waterways Conservation Act 1976.
- § The Western Australia Marine Act 1981.

In United Kingdom, one deals with Mineral Policy Guidance Note 7 entitled “The Reclamation of mineral working” for overall planning for mine closure issued by:

- § Department of the Environment 1996.

In the above countries, there are similarities at the national and sub-ordinate levels of Government but have difference while dealing post-closure responsibilities and abandonment. In the above countries, one deals with specific provisions for reclamation, EIA requirement, provision for abandonment and provision for non-compliance in most of the countries. EIA requirements require consideration of the social impact and environment is one of the common things of policy and legislation.

In Africa, Asia, South America and Latin mine closure policies vary considerably. In many countries mine closure is not addressed properly. In some countries (Peru, Argentina, Tanzania, Brazil, Chile, etc.) mine closure practices has been playing a rapidly increasing and diversifying role. Provision for the mine closure in the above countries is dependent on the past mining activities and related policy and legislation.

In countries like Indonesia, Myanmar, Brazil, Chile, China, Peru, etc. state run mining operations have features like:

- § Limited contingent liabilities for fore in investors;
- § General legislation and policy for mine closure;
- § Closure issues being normally incorporated;
- § Few bonding for comprehensive mine closure;
- § Closure issues being incorporated into individual mining operations; and,
- § For the closure of mining operations, the retention of a high degree of state responsibility.

In countries like Tanzania, Thailand, Latin, Mexico, Ecuador, Papua, New Guinea mining operations have features like:

- § A high degree of responsibility for both operational and abandoned mines;
- § Few bonding for comprehensive mine closure; and,
- § General policy and legislation for mine closure.

In countries like Mongolia, Burkina Faso, Bolivia, Namibia, Philippines, Viet Nam and Zambia, there is comprehensive policy and legislation that provides for comprehensive mine closure. But in many of the countries of Africa, South America, Asia, there are not adequate number of policies and legislation. This leads to problem like post closure sustainable development for Government.

4.2 South African Policy

In South Africa, the legislations for the mining industry framed as early as 1903 have placed the responsibility of environmental management on the mine owner. Once the mining is over and the area is properly reclaimed and closed, the owner is issued with a certificate by the Government releasing him from the above mentioned responsibilities. In Minerals Act 1991 modifications are there with the aim of formulating principles for mine closure and to protect and conserve the environment.

According to the Section 12: "If any prospecting permit or mining authorization is suspended, cancelled or abandoned or if it lapse in terms of the act, or if any portion of the land comprising the subject of such permit or authorization is abandoned or the operations at a work cease, the person who was the holder of such permit or authorization immediately prior to such suspension, cancellation, abandonment or lapsing or the holder of such permit or mining authorization or the owner of such works, as the case may be, shall remain liable for complying with the relevant provisions of the act until the Regional Director issues a certificate to the effect that the said provisions have been complied with".

The granting of certificate in terms of Section 12 of the Minerals Act 1991 provides procedure of consultation between owner, affected parties, Government and the lead agent.

In Section 30 (3) of the Minerals Act 1991, the Regional Director of the Department of Mineral and Energy Affairs before approval of any EMP or grants any exemption or any temporary authorization or any extension of time shall consult with each department

charged with the administration of any law which relates to any matter affecting the environment.

According to Minerals Act 1991, a mine can be considered closed once the Regional Director has issued a certificate as mentioned in Section 12. If all provisions of the act have been complied with and that all closure objectives framed in environment management plan or closure plan have been met, the Regional Director shall issue a certificate. Residual impacts must be there in environment management plan or closure plan. After consultation with Government and the mine, Regional Director finalized arrangements in terms of which state and mine are satisfied and impacts will be adequately dealt with before a certificate is issued.

According to Section 39 of the Minerals Act 1991, Regional Director shall, prior to approving any EMP consult with departments as mentioned above and EMPs are compiled in accordance with the requirements of the Aide-Memoire for the preparation of Environmental Management Program Reports for prospecting and mining.

An unconditional certificate shall be issued to a mine in terms of Section 12 provided the above-mentioned requirements have been met.

4.3 Financial Provision

Determining the costs and to apply these costs during the life of operation with respect to closure is a fundamental part of closure planning. It is necessary to estimate the cost of closure as early as possible. To determine whether a project is economically feasible, realistic closure cost during the feasibility stage is necessary. Closure cost estimates must be based on an actual closure design. For mining companies, closure cost estimates are for providing funds for closure and for regulatory agencies, closure cost estimates are for establishing financial surety which may be in the form of bonds, insurance, trust funds etc.

The objective of financial provision is to ensure the cost of closure is adequately represented in company accounts and that the community is not left with a liability.

Financial provision involves the following principles:

- § A cost estimate for closure should be developed form closure plan.
- § Closure cost estimates should be reviewed in regular basis to reflect changing circumstances.

- § Real cost should be reflected by the financial provision.
- § Accepted accounting standards should be the basis for the financial provision.
- § Adequate securities should protect the community from closure liabilities.
- § Monitoring cost should be a part of cost estimate for closure.
- § The cost dealing with removal or structures should be reflected in actual cost.

In general, real costs associated with decommissioning, rehabilitation, impacts on surrounding environment, impacts on community, environmental monitoring, maintenance of site, long term treatment facilities and relinquishment provide the basis for estimating the cost of closure.

The mine closure design including all elements of the site must be prepared to estimate the cost. This design must be based on realistic assumptions. Mine closure cost estimates are implemented during the life of mine as the final decisions about implementation of closure, land use issues, post-mining responsibility become clear.

Financial surety is in place during the total life of the mine and it is the amount of money available to a government entity for closure of the mine in case when the owner of mine is not available to perform the work during operations or anytime thereafter. Miller (1998) defines financial surety instruments as:

“Guarantees issued by a bonding company, an insurance company, a bank, or another financial institution (the issuer is called the ‘surety’) which agrees to hold itself liable for the acts or failures of the third party”.

It is important that the government policies and local financial markets may determine the type of instrument available for a specific location.

Financial accrual is another concept for mine closure. Accrual is generally based upon a unit production. The total amount of the accrual is estimated from cost of environmental closure plus other liabilities like personnel cost associated with the end operations, land holdings, etc. at a specific mine. Annual reviews are done to determine the adequacy of closure funds.

A few mining companies have established sinking funds to pay for the closure of mine. Money from a sinking fund will be available in cash to pay for mine closure while an accrual is an accounting allowance. But, in the case of a bankruptcy it becomes part of the assets of the company and will not be available to pay for closure.

There are considerable variations between countries in financial accounting practice. There is no specific international accounting standard dealing with costs of closing a mine. There are three methods commonly used, these are (Pricewaterhousecoopers, 1999):

Expense as Incurred:

- § In this method expense all costs as they are incurred. One can justify this method because at the end of life of mine, one can sell any fully written-down assets and re-work waste piles, slag heaps and tailings dams to provide cash surpluses.
- § This method is not recommended because it is not in accordance with the international framework principles. In recent years, this method has not been commonly used.

Incremental Method:

- § In this method, closure costs can be accrued by gradually increasing the provision over the whole life of mine Estimating the future cost of restoration and then build up to that cost over the life of mine by making periodic provisions is adopted by many mining entities.
- § The objective behind this method is to ensure that the full liability is accrued at the end of the life of mine and closure costs are allocated equitably to the periods of operation. In early stages of mining, the liability is often small, so only limited disclosures are generally provided.
- § Most mining companies adopt incremental method.

Full Liability Method:

- § In this method, you provide for the total present value of the future cost of repairing past damage and other related shot down costs as soon as the commitment is incurred.
- § Under this method, the amount capitalized is amortized over the whole life of mine.
- § This method is not commonly used.

Many countries require cash deposits instead financial surety for mine closure. The cash deposit is based on production that means the cash deposit can be paid on a per tonne basis and could be available for mine closure.

Abandoned mines are found in many places all over the world. Funds are required for the rehabilitation for such abandoned mines. In some cases governments are forced to on the task of rehabilitating abandoned mines when there are no identifiable owners or if the owners have no funds to pay, while another is that the previous owners should be held responsible for such cleanup actions.

Concepts with respect to abandoned mines are:

- § Mine closure legislation can enable the regulating authority to control and prevent operating mines from becoming abandoned mines by setting up funds for rehabilitation.
- § Polluter pays principle will be discussed together with the role of governments in establishing these environmental policies.
- § Third parties involvement in abandoned mines rehabilitation, which sometimes involves liability issues that can discourage potential efforts to reclaim them, will also be analyzed.
- § Co-operation between regulatory agencies and community groups will be required. It is conceivable that other funding sources may be located when such multi-stakeholder groups are formed like: Animas River Stakeholder Group in Colorado.

The cost estimates to rehabilitate abandoned mine lands are very uncertain. Lyon et al. 1993 estimated US \$ 32.7-71.5 billion to reclaim the 557,650 abandoned mines in the USA.

The approach, “Present mining industry should contribute to a fund that can pay for the rehabilitation of the abandoned mines” is part of the US Surface Mining Control and Reclamation Act 1977 (SMCRA). Inter alia, the law provides for the restoration of lands mined and abandoned or left in adequately restored before August 3, 1977. Abandoned Mine Reclamation Fund is established, where production fees of 35% per ton of surface mined coal, 15% per ton of coal mined underground and 10% per ton lignite are deposited, which is used to pay the reclamation costs of ‘Abandoned Mine Land Projects’ such as, in the state of Wyoming all abandoned mines have been rehabilitated.

Tasmania established a Trust Fund, as part of the Mineral Resources Development Act of 1995 for the rehabilitation of abandoned mines. Trust Fund can be used to clean up mines.

Another approach is to provide incentives for active mining companies to participate in the rehabilitation of abandoned mines. Active mining companies usually have the equipments to perform much of the work.

Some companies have agreed to rehabilitate old sites within their lease as one of the conditions for receiving an exploration or mining license.