



## CLOSURE AND REHABILITATION PLAN

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## 1. SCOPE

The Closure and Rehabilitation Plan is a conceptual plan which is designed to address all aspects of rehabilitation and closure of the potash mining activities.

The development of a new mining activity in an area inevitably impacts the land as well as the communities living there. The operational life of the planned potash mine is 20 years, but changes can go on for a longer time. It is therefore important to integrate the site closure and rehabilitation into the lifecycle of the mine.

Through its environmental policy, MagIndustries is committed to implement the best environmental practices recognised in the industry, to comply with the laws and regulations of the countries where it is carrying out its projects and to apply the Equator Principles along with the World Bank's policies, guidelines and procedures in terms of the environment for the mining industry.

## 2. PURPOSE

This document presents MagMinerals' objectives concerning closure, dismantling of infrastructure and rehabilitation of sites which will be used for the Kouilou Potash Project. The plan for closure and rehabilitation will evolve with the development of the Project. The conceptual plan presents:

- identification of affected areas;
- concept of the progressive rehabilitation and the rehabilitation of the land principles to ensure its physical and chemical stability and its revegetation;
- identification of the infrastructure to be dismantled and those which could be reused;
- the mitigation strategy for social impacts of the closure;
- provisions in the case of temporary, enforced or early closure.

The closure management strategy is to derive the most appropriate option for closure in terms of performance and cost. The development of the strategy is a stepped approach based on:

- Understanding of current and predicted future impacts;
- Derivation of realistic objectives and targets set to manage identified impacts;
- Setting an overall vision for closure;
- Identifying and evaluating alternative closure scenarios based upon agreed criteria;

- Providing a framework for ongoing consultation with all stakeholders, i.e. authorities, employees, communities and others;
- Establishing a system for the ongoing review and updating of the closure strategy and plan based on the above steps.

### 3. CLOSURE IMPACTS

#### 3.1 Environmental Impacts at Closure

Anticipated impacts during the life of the operation have been assessed and described in the ESIA. Current impacts at the time of decommissioning will depend on:

- The degree of success of mitigation measures during the operational phase;
- Any process or infrastructural changes that may occur during the operational phase.

In this situation, for closure planning, liabilities must be assumed to be as described in Chapters 7 to 11 Volume II : Environmental Baseline and as summarised below. Most impacts on the physical environment will no longer persist on closure of the Kouilou Potash Project, but those that will are shown in Table 1 below. While detailed impact sheets have not been prepared for this summary assessment, it is based on a knowledge of the activities to date, the project baseline and the project itself, as well as from other mining projects elsewhere. The impact assessment will be reviewed periodically as detailed in Section xx below.

**Table 1: Assessment of Impacts on VEEs following closure**

Valued Element of the Environment	Magnitude of Impact at Closure	Rationale
<b>Physical Environment</b>		
Climate	No impact	No GHG emissions will take place
Air Quality	No impact	No combustion or dust generating activities
Ambient noise	No impact	No noise generating activities
Geology, seismicity and geotechnics	No impact	No ongoing drilling or mining activities
Topography and geomorphology	Very Low	Small risk of continued subsidence around last caverns
Soil quality	Low	Possibly some effect on quality over time
Hydrogeology	Very Low	No further interactions with groundwater, no open cavities in the saturated zone, no connectivity between saline horizons and aquifers or hydraulic connectivity with surface.

Hydrology	Low	Some small diversions or modifications to channels and flows may occur during the closure process.
Water and freshwater sediment quality	Very Low	No ongoing activities, potential for some erosion before vegetative cover establishes.
Physical oceanography	No impact	No further discharge to the ocean
Marine water and sediment quality	Low	Possible slow recovery of area affected by brine discharge.
<b>Biological environment</b>		
Vegetation	Low	Natural habitats may not show same structures on rehabilitation
Freshwater benthos	Very Low	Possibly some residual erosion which could affect benthos
Freshwater fish	No Impact	No discharges which could affect fish populations
Amphibians and reptiles	No Impact	No activities to disturb or damage habitats
Land birds	No Impact	No activities to disturb or damage habitats
Land mammals	No Impact	No activities to disturb or damage habitats
Marine benthos	Low positive	Additional substrate (pipeline) may remain, benthic fauna can recolonise impacted areas
Marine fish	Low positive	Fish can recolonise area of effluent plume
Marine reptiles	No impact	No activities to disturb or damage habitat
Marine birds	No impact	No activities to disturb or damage habitat
Marine mammals	No impact	No activities to disturb or damage habitat
<b>Human environment</b>		
Land Use	Medium positive	Land which has been removed from local community use may be returned
Existing infrastructure	Medium positive	Roads and other infrastructure created by the project will remain
Public health services and infrastructure	Medium positive	These will have been improved through CDP and Foundation activities
Demography	Very low	Possibly some outward migration as jobs cease
Economy	Medium	Loss of supply contracts and multiplier effects
Employment	High	Loss of direct and indirect jobs, reaching further than actual employees
Social organisation	Medium	Probable improvements through CDP and Foundation activities and programmes will remain
Community health	Medium positive	This will have been improved through policy commitments, CDP, malaria and HIV programmes
Education	Medium positive	Education of staff, improvements to school facilities through CDP activities should persist, higher residual levels of education in the population
Cultural and religious heritage	Low positive	May be strengthened from CDP activities, benefits will remain
Landscape	No impact	No residual effects

### 3.2 Social Impacts

The Kouilou Potash Project is a significant initiative in an environment where poverty is pervasive, unemployment is high, social services are limited and infrastructure is largely outdated and in poor condition.

Closure impacts in the socio-economic context are broadly the following:

- Loss of economic benefits to: the government, *i.e.* taxes and royalties; employees; communities; local service providers; and the local economy in general;
- Loss of social benefits in the form of: loss of access to general services (due to loss of income); and loss of access to company provided services, e.g. health care.

The management of the social aspects of closure will be developed in more detail during operations, with opportunities to minimize negative impacts and maximize benefits. Preparation for these aspects may begin 3 years prior to closure, in order to identify other job opportunities, provide training or retraining and prepare staff and dependents for life after the mine has closed.

### 3.3 Project Affected Areas

The Project will be mainly established on the Mengo Plateau, but will have installations at the port of Pointe-Noire, on one bank of the Loémé River, and will use land corridors for its pipelines and for energy transport (Table 2).

**Table 2 Surface used by the various infrastructure.**

Component	Surface area (ha)
Plant site	53
Brine Field	217 <sup>1</sup>
Port facilities	4
Pumping station	negligible
Railway spur line, electrical line, freshwater supply and brine effluent pipelines	78
<b>Total of the affected areas</b>	<b>352</b>

<sup>1</sup> The total brine field area will be approximately 752 ha, but only 29 % will be directly affected by the solution mining infrastructure, This does not take into account the progressive rehabilitation

The aim of post-closure site rehabilitation is to made the site safe and stable again and to restore its potential for enabling any activity compatible with existing activities in the region. The post-closure mitigation and rehabilitation measures aim to:

- Eliminate health and safety risks to people;

- Ensure that closure will not adversely affect physical and biological resources and that project reference criteria established in the ESMP and individual management plans continue to be met. In the long run, achieve a state in which monitoring is unnecessary;
- Restore the site to a condition acceptable to the community;
- Remove infrastructure to leave a condition compatible with future usage.

Objectives include the following:

***Physical stability of structures.***

At a normal mine this would include the tailings dam, waste rocks dumps and open pits or underground mine workings. In the case of the potash project, there are none of these facilities. Caverns will be backfilled as they are completed and any surface subsidence at already filled caverns can be monitored for up to 18 years during the life of the project (the first caverns will be backfilled at the end of the second year of production). Therefore, necessary adjustments can be made to the backfilling process during operations, so that by closure, it is optimised for least possible future disturbance. No other structures will remain that cannot be removed and dismantled or left for future site use. Surface drainage will not be disrupted by the project but drainage of the plant site following the removal of buildings and structures will be carefully considered to avoid soil erosion. The spill way which will drain the upstream part of the plateau (ie will divert clean water around the site) during operations may remain in place.

***Chemical stability of the site:***

No reagents or residual materials which could affect surface water and groundwater will remain at the site or any of its infrastructure locations. Any spillage of potash will be cleaned up and disposed of during ops, any spillage of NaCl or MgCl brine will also be cleared up but may leave residual salinity in the soil in the area of the spill. As far as possible this would be dug out and replaced with clean material from stockpiles during operations, but some residual contamination may remain which may affect vegetative success of reclamation efforts in restricted locations. There is no possibility of ongoing or future contamination with KCl, MgCl or NaCl as there is no remaining source of these materials at site following closure.

***Biological stability:***

The majority of the land to be used for the project is in eucalyptus plantation and given the lack of reagents and residual materials, and therefore potential contamination, there is no reason why total revegetation success is not possible. Progressive rehabilitation of the brine field will include a few fields and fallow areas and techniques and successes experienced in the rehabilitation of these will be brought to bear on final rehabilitation of the site. Soils in the area have generally very low nutrient status and are very sandy. Efforts will be made to improve the quality of replaced soils through the use of soil conditioners and

soil forming material developed from bentonite mud (to increase cation exchange capacity and water retention) and organic matter from composted material (to add nutrients and improve soil structure). Particular efforts will be made in the rehabilitation of the few natural or semi natural habitats such as wetland or riparian zones areas affected, such as stream crossings and the Loeme pump house, to ensure successful, appropriate, revegetation of these areas. Experience from the implementation of the Biodiversity Management Plan will also be used in this regard, and the input of local communities, local government and other organisations such as the Ramsar authority will be sought in the development of the ecological aspects of the closure plan.

As far as possible, closure technologies will be selected which allow 'walk away', and where this is not possible, 'passive after care' will be selected over 'active after care'. As there are no significant surface deposits or excavations as in a conventional mining project, it is believed that no active care will be required in the longer term and that the site can, if required, be returned to its pre-mining land use.

#### **4. CONSIDERATION OF CLOSURE ALTERNATIVES**

Once the alternatives have been considered according to the criteria outlined above, consultations will be held with key members of the local community including local government, customary authorities and community groups in a multi-stakeholder process.. Their views and aspirations for post-mining land uses will be sought that incorporate realistic cost effective and sustainable beneficial end uses.

The feasibility of different end uses will be considered in terms of:

- Engineering aspects;
- Monitoring requirements;
- Implications of return periods of for example rainfall and flood events;
- Reliability of technology;
- Capital costs;
- Any ongoing costs;
- Community health and safety;
- Sustainability of land use.

End uses that may be considered include:

- Industrial development, *i.e.* a single large scale development, or a series of light industrial units using existing infrastructure;
- Housing (in appropriate areas);

- Recreational facilities;
- Plantations for fuel wood;
- Agricultural land (subject to suitability assessments including the potential for contamination of crops);
- Semi-natural vegetation.

It is recognised that land use pressures may change significantly over the life of the Project with population growth and technological development of the city of Pointe-Noire, *i.e.* a move away from rural economy.

In the last few years before the mining operations cease discussions will be held with the authorities and the local population as to the best use for the infrastructure when the mine closes.

Agreements will be reached with the authorities and the local population in this regard, although this will be an ongoing process. The relevant authorities will be contacted through the correct channels and their final approval will be sought, as closure approaches.

This procedure assumes the mining activities are decommissioned as scheduled. However, in the event of an early or premature closure, these discussions will need to be initiated immediately the closure decision is taken, either through the Public Liaison Committee or the Foundation (if it is operating effectively at the time of closure).

## **5. PROGRESSIVE REHABILITATION DURING THE LIFE OF THE PROJECT**

At the end of the 1990s, organisations which finance mining projects highlighted the lack of regulation relating to the rehabilitation of mining sites. Since then, several governments have legislated to this end and UNEP has published a document<sup>1</sup> on the good practices to adhere to, in order to ensure suitable rehabilitation of mining sites, and stressed the design for closure philosophy. The closure, rehabilitation and post-closure monitoring of sites are now an integral part of the lifecycle of a mining project. More recently, ICMM have produced a document *Planning for Mine Closure: Toolkit* in 2008 which updates and expands upon the UNEP document.

### **5.1 *During Project Development and Construction***

Within the framework of the Project, the infrastructure has been designed to minimise relocation of the population and deforestation, and to optimise the use of existing infrastructure, such as roads, railway and port.

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<sup>1</sup> Mining for closure – Policies and guidelines for sustainable mining practices and closure of mines; UNEP, UNDP, NATO, OSCE, 2005.

From the construction phase onwards, the top soil will be put aside and protected from erosion to ensure its future use. The soils will also be used as a platform for revegetation trials.

The slopes generated during construction work will immediately be reduced to avoid the anticipated soil erosion, and covered again with vegetation to ensure their physical stability. Places such as roadsides, banks of watercourses and borrow pits will be particularly closely supervised to this end.

MagMinerals has been working with a specialist company based in South Africa, but which works widely throughout sub-Saharan Africa, to develop techniques and methodologies to revegetate the surfaces exposed during site earthworks which have involved destumping and removing the top soil and some subsoil from the plant site and other areas which will be used during construction. A detailed proposal has been received but the work has not been implemented due to uncertainty about the timing of the next phase of work, i.e. platform preparation. The proposal includes the establishment of a local plant nursery, in the communities, which will be used to provide the plants needed for some aspects of the revegetation and which will include Vetiver grass, widely used in the revegetation of highly erodible soils in many parts of the world due to its very deep roots.. Other areas will be hydroseeded with a mixture of seeds, alginates, fertilizer and fibres which create the ideal conditions for the rapid germination and establishment of a vegetative cover. These techniques will be documented and used for the on-going rehabilitation of areas no longer needed for construction, such as pipeline corridors, landfill cells etc, as well as non-active areas of platforms once drilling is complete.

## **5.2 During Operations**

Operating a cavern will last an average of two years and some twenty-five to thirty caverns will be in operation simultaneously. During the operations, NaCl will be produced that will be slurried to the ocean for 2 years, then returned to the caverns to backfill the void created by the leaching of the carnallite and thus ensure the physical stability of the surface and the chemical stability of the groundwater. No caverns will be available for backfilling during the first 2 years of operations.

The surface installations on the cavern sites which have been backfilled in this way will be dismantled and used for another group of caverns; the tracks will be scarified and the soils levelled and replanted with vegetation.

Revegetation trials will be carried out on the stored soils and on the surface of the first caverns where operations have been completed. This programme will aim at identifying the species which are most suitable to the local growing conditions, and will also draw on experiences gained during any earlier revegetation work.

The possibility of returning the well head platforms to the community for fields has been discussed at length, but there are a number of health and safety issues of concern, not least the ongoing traffic movements in the brine field for work-over purposes during the operational phase of each cavern. At the moment, it is planned for the drill/well head platforms located within the eucalyptus plantations to be replanted with eucalyptus following the next harvesting cycle. A Management Agreement will be put in place between MPC and EFC to ensure that this takes place in accordance with this and other management plans.

Periodic surveys of the brine outfall area during the life of the project will allow an assessment to be made of the extent of the long term impacts, if any, of the brine discharge on the marine benthic fauna. Natural recolonisation of the area may be expected to occur over time once the brine discharge ceases; however, the presence of the pipeline itself is expected to provide a new substrate for certain types of marine fauna. Species diversity may actually increase with time, rather than decrease, in what is an area of already very low diversity and relative unimportance as a marine habitat.

Throughout these operations, installations which will have completed their life cycle, such as the temporary camp for the construction workers, will be dismantled and the land levelled and replanted with vegetation. The dismantled materials will be sorted for reuse internally, offered to the population or disposed of. The materials offered to the population will be clean and checked to avoid any injury or contamination to the users or their families. The materials which will be disposed of will undergo this process in compliance with the site's waste management procedure.

## **6. REVIEW AND DEVELOPMENT OF THE CLOSURE PLAN**

This conceptual Closure and Rehabilitation Plan will be reviewed and updated during the detailed design phase and early construction when the details of what will be built are better understood, and developed into a detailed plan during the early years of operations (ref IFC Mining EHS Guidelines).

Thereafter, the plan will undergo a high level review each year, to verify the financial provisions and to ask key questions relating to material issues in relation to the plan, such as:

- Has the mine plan changed?
- Has the life of mine increased or decreased?
- Have new environmental issues been identified?
- Has the legislative framework changed?
- What lessons have been learned from progressive rehabilitation?
- Has the project foot print changed?

If significant differences in any aspect of the plan are identified as a result of this high level review, the relevant section of the plan will be reviewed and updated. Thereafter, detailed technical reviews and updates will take place in years 6, 12 and 18 of operations, up to the permanent closure decision, when the Closure and Rehabilitation Plan will be further developed ready to be implemented ahead of closure.

## 7. IMPLEMENTATION OF CLOSURE PLAN

When the decision is made to permanently cease the operations, the Closure and Rehabilitation Plan will include a full description of the infrastructure in place, of the decisions which will need to be taken to determine which installations will be dismantled, and which installations may be offered to the communities or local governments. The final use(s) of the site will be discussed in an ongoing process with the communities and local governments as outlines above, to ensure that the final afteruse is compatible with local and regional needs and that the best use is made of available resources.

The Plan will be implemented within the framework of the ESMS which will be in place at the site. This includes the following Management Plans:

- Water
- Waste
- Soil and Erosion Control
- Hazardous Materials
- Biodiversity
- Air quality and noise
- Occupational Health and Safety
- Stakeholder Engagement
- Labour and Human Resources
- Community Health and Safety
- Risk, including Emergency Preparedness and Response
- Malaria Management

Each of these plans will be revised to take account of the closure process in the two years prior to planned closure, or immediately on enforced closure. Each of these plans is supported by Standard Operating Procedures (SOPs) and contain clear responsibilities, reporting lines and record keeping. Adjusting these plans specifically for the closure activities will ensure that the project continues to operate within carefully prescribed limits and in accordance with company and legislative requirements.

All the buildings and infrastructure which are not useful to a future non-mining use of the site will be dismantled. The inert underground brine pipeline will stay in place after flushing, but any pipeline that might contaminate the soil or groundwater will be removed. The brine outfall

and marine section of the brine pipeline will be evaluated as a habitat for marine benthic fauna before any decision is made about its removal, partial removal or whether it should be made safe and left in situ. The electricity lines and substations which are of no use to a future site user will be dismantled; however a future site user may also wish to make use of the power generation facilities at the site. The line to the water supply point could remain, as could the power supply to the port, should the future use of the site require rail access to the port rather than road access.

Specific mining related equipment with a commercial value may be sold. All dry materials from the dismantling which are reusable will be sent for recovery whilst obsolete dry materials will be gathered together in the excavations left by the foundations, or in a designated area of the solid waste disposal facility, then covered with loose material. The hazardous waste will be removed in a way which complies with local regulations if they exist, or in accordance with recognised good practices.

A summary characterisation of the soils with the potential to be contaminated with hydrocarbons will be carried out, in particular around the reservoirs, mechanical workshops and warehouses. It is certain that regular activities and occasional incidents will inevitably lead to contamination of a certain quantity of soil. Using the management system which will be set up, regular maintenance will be carried out and the majority of these soils will be collected as work progresses. The soils contaminated with hydrocarbons at the end of the operations will be removed in accordance with good practices in the field.

The storage tanks not required by a future user and belonging to a supplier, will be recovered at the time of closure; the others will be cleaned and sold if possible, or dismantled and sent for recovery of materials or disposal.

The roads to be closed will be scarified and the culverts removed.

The basins will be emptied, cleaned, if appropriate, and levelled. The final levelling will be carried out in such a way as to create a drainage pattern, which will avoid accumulation of stagnant water and will direct precipitations to a main discharge point. The surfaces will then be replanted with vegetation.

The surface water and the groundwater along with the vegetation growth will be the subject of environmental monitoring for several years after closure. The frequency and duration of this monitoring will be determined in discussion with the authorities.

At the end of the operations, the majority of the brine field must be levelled, cleaned and replanted with vegetation. The NaCl temporary storage basin would have to be emptied. The remaining installations on the mining sites will be dismantled, the reusable materials will be sent for recovery whilst obsolete dry materials will be gathered together in the excavations

left by the foundations, then covered with loose granular material. The hazardous waste will be removed in a way which complies with local regulations, if existing, and if this is not the case, in accordance with recognised good practices.

All waste other than the demolition waste and the hazardous waste will be disposed of in the landfill site used during the operations. If appropriate, the landfill site will be closed at the end of the rehabilitation activities, and this will be done in compliance with recognised industry good practices.

## 8. SOCIAL ASPECTS

According to the World Business Council for Sustainable Development ([www.wbcsd.org](http://www.wbcsd.org)), companies are responsible for contributing to sustainable economic development by working with staff, their families, the local communities and society in general to improve their quality of life. Closure of a company is a hardship for a community and this phase in the lifecycle of the mining project must therefore be planned for in the same way as for the previous phases. MagMinerals Potasse Congo (MPC) / will develop strategies for mitigation of the social impacts of the closure.

Mitigation measures will be proposed to address all of the impacts identified in Section 3 above. In general, the mitigation measures may include the following:

- Implement measures to provide access to alternative employment opportunities;
- Ensuring that local government takes responsibility for infrastructure development and service delivery facilitation;
- Promoting collective and sustainable action to raise general levels of economic activity and service provision;
- Recognising the cumulative social impacts generated by other mining ventures, and linking with these to enhance the continuation of mining-related social and economic benefits.

Approximately three years before the foreseeable end of operations, a social management programme for the closure will be set up. This programme will be developed through collaboration between the company's management and the Public Liaison Committee. Amongst other things, the programme will aim to:

- help staff to find another job or to set up in business;
- find uses for infrastructure which are in good condition;
- establish a post-closure social monitoring programme.

The setting up of social practices by the mining industry contributes to the reduction of poverty in regions neighbouring the mining projects, but so that what has been acquired remains after closure of the operations, social programmes must continue to be implemented and their effectiveness must continue to be monitored. The Stakeholder Engagement Plan (SEP) and Community Development Plan (CDP) benefits shall be highlighted and most beneficial programmes should be transferred to local management.

## **9. TEMPORARY CLOSURE – MORE THAN 3 MONTHS**

In the case of a temporary/enforced cessation of activities, a guard force will continue to make sure access to the site is restricted only to those people who are authorised. The method of storage of chemicals will remain the same as during operations, but the various buildings where they are stored will be locked out.

All accesses to the mining areas will be locked out. The environmental sampling will continue at the same frequencies as during normal activities if it is safe for staff to do so.

Visual inspection of the installations will be carried out on a daily basis. Related security protocols to cover this will be more thoroughly detailed in the company's Risk Management Plan.

## **10. EARLY CLOSURE**

If an early closure were to occur for any reason,, the communities and authorities would be advised and consultation could take place if conditions allow it.

Depending on the reason for early closure and time allowed to leave the country, should evacuation procedures be put in place, the temporary closure measures or final closure measures would be applied.

The minimal closure activity is to secure the , the potash plant and power plant.

## **11. SITE MONITORING AT AND POST CLOSURE**

Closure monitoring will be conducted to confirm the effectiveness of reclamation activities. The intent of both the physical and chemical monitoring program is to demonstrate stable or improving conditions with time.

Closure monitoring will be conducted over a 5-year period. Years 1 and 2 represent active decommissioning of the site infrastructure. Years 3 to 5 represent the "post" closure period, or the period following the decommissioning of the site. Criteria will be developed for release from monitoring activity based on conditions that are better than during operations.

It is expected that portions of the site that will be closed-out progressively could be released from the monitoring program before mining operations cease, after establishment of a stable state.

### **11.1 Physical Monitoring**

Physical monitoring will involve a review of cavern closure, reclamation and revegetation efforts to identify subsidence and erosion concerns and evaluate the sustainability of the vegetation. Geophysical and visual monitoring will be done every second month with site inspections. In addition, annual survey from the air or by the use of satellite imagery will validate and complete the data gathering. Corrective measures will be implemented as soon as possible.

### **11.2 Chemical Monitoring**

Sampling and analysis will be conducted for both surface and ground water. Ground water will be monitored annually at existing wells. Surface water will be monitored on a monthly basis. Analyses will include the following parameters:

- pH
- conductivity
- total hardness
- suspended solids
- total metals, such as As, Fe, Cu, Pb, Zn, K, Mg, Na

During years 1 and 2 operational monitoring stations will be sampled. During years 3 to 5, sampling will be reduced. Water quality results will be reviewed on an annual basis and the monitoring program modified as required. Procedures to be followed are detailed in the Water Management Plan and its related SOPs.

## **12. RESPONSIBILITIES**

The HSEC Department and the Engineering Department will work together on both the review and development of the closure plan, but also its implementation., with HSEC taking the lead in plan development and the Engineering department in implementation. Progressive rehabilitation will likewise be led by the HSE section but in collaboration with the drilling department, who will be responsible for implementing the rehabilitation of the platforms and other areas where work has ceased.

The organogramme is as shown in the ESMP. The organogramme for the closure phase will be developed when the closure plan is developed in more detail during the early years of operations, The detailed plan will include a schedule of activities, programme and detailed budgets and responsibilities.

### **13. COMMUNICATION**

The HSEC Department will be responsible for communicating the plan within the company and with stakeholders, including local communities and regulatory agencies. The methods of communication will follow those developed and documented in the Stakeholder Engagement Plan (SEP) which will be developed in time to cover the detailed consultations required around closure planning and closure itself. Feedback from meetings, workshops etc will be recorded and taken into account in developing the detailed plan.

An outcome of this process will result in a document which will be submitted to government for or regulatory approval.

### **14. CLOSURE BUDGET ESTIMATE**

Presently, the total cost for dismantling and physical rehabilitation of the potash plant and the solution mining infrastructure is calculated at approximately USD 14.7 M. This amount includes the decontamination of the diesel storage and transformers areas, landscaping and revegetation, and credits for some equipment and scrap metal recovery. These figures have been developed by the engineers who have designed the project and who therefore have a very detailed knowledge of the project components, and who are familiar with costing closure. The estimates of closure and rehabilitation costs have been calculated to exclude works that will be carried out during the development and operational phases of the Project.

The estimated costs of the mitigation and rehabilitation plan have been summarised below, assuming that closure is as projected, at the end of the 20 year Project. This shows the main tasks associated with closure such as demolition, preparing land for rehabilitation and carrying out revegetation where appropriate. The costs of items such as demolition and revegetation include all associated costs such as staff costs, materials, waste disposal, etc. as it is assumed that these will be carried out by contractors.

**Table 3 Estimated Closure Costs.**

Area	Status	Estimated cost (USD Q2-2009)
<i>Buildings</i>		
Admin Building (or Trailers), Operator Camp	Remove	782,000
Maintenance & Spare Parts Bldg	Remove	386,000
Guard house, fire fighting Bldg	Remove	63,000
Rail car maintenance Bldg & Spur Line	Remove	465,000
<i>Utilities</i>		
Gas Turbine	Remove	180,000
ES-1	Remove	140,000
Boiler & Steam Dist'n	Remove	218,000
Raw water & potable treatment & de-min	Remove	295,856
Compressed air & dist'n	Remove	118,000
Cooling tower & Dist'n	Remove	435,000
Fuel Gas & Flare	Remove	128,000
Sanitary water treatment	Remove	88,000
Emergency generator & Dist'n	Remove	99,000
Diesel Storage & Dist'n	Remove	23,949
	Diesel Decontamination	480,000
Process piping on piperack to Crystallization	Remove	27,300
Process piping on piperack to Compaction	Remove	9,300
Process Bldgs & Equip		
Compaction Plant & Equipment & ES-3	Remove	1,429,371
	Transfer Oil Decontamination	80,000
RailCar Loading Bldg & Equipment	Remove	125,850
KCl Conveyor	Remove	11,600
Emergency Storage Bldg & Equipment	Remove	320,000
Solids Separation Bldg & Equipment & ES-2	Remove	1,546,075
	Transfer Oil Decontamination	80,000
Crystallizers & Structure	Remove	591,510
Evaporators & Structure	Remove	1,470,781
Crystallization tanks & concrete	Remove	260,897
<i>Process Support Areas</i>		
Salt Re-slurry system	Remove	24,000
NaCl and Feed Brine Storage berm & membrane	Remove	320,200
Process storage tanks & pumps	Remove	152,597
Stormwater collection basin	Remove	42,000
<i>Off-Site Areas</i>		
Dockside storage Building & Equipment	Remove	320,000
Dockside Admin Bldg	Remove	50,000
Shiploader	Remove	20,000
Solution mining piping - Main headers & remaining strands	Remove	116,760
Solution mining area - Remediation of last areas in operation	Remove	971,712
MgCl <sub>2</sub> disposal line	Remove surface piping	60,000
Pump House & Water Line	Remove	Incl. in Raw Water
Power Line to Pump House	Remove	Incl. in Raw Water
Power Line to Dockside	Disconnect at both ends and at junction point only	Incl. in MgCl <sub>2</sub> Disposal Line
Allowance for landscaping, vegetation		3,200,000
Credit for removed equipment-scrap value		-440,821
<b>Total</b>		<b>14,690,937</b>
Area	Status	Estimated cost (USD Q2-2009)

**15. PROVISION OF FUNDING FOR CLOSURE.**

IFC Performance Standards (and therefore EP) contain little detail on Closure as an issue. The EHS Guidelines for Mining dated Dec 10 2007 do contain a short section on Mine Closure and Post Closure. However, ICMM has a few papers which refer to closure. One of these, a Guidance Paper on Financial Assurance for Mine Reclamation and Closure, identifies the closure ‘standard’ (which can change during mine life), calculation of closure costs, and the flexibility and cost effectiveness of assurance requirements as the key issues. The paper identifies that closure costs can often be over-estimated to the detriment of the finances of the operation. Some of the aspects of cost calculations are listed:

- The application of a wide range of safety factors, including protection against highly unlikely events;
- Cost calculations based on closure execution managed by a third-party rather than internally, regardless of the likelihood that a third-party will be required;
- Calculations based on the ultimate development (maximum footprint) of the mine site rather than the costs of reclamation at a given stage of the mine life;
- Lack of recognition of liability reduction as a result of progressive reclamation;
- Failure to consider the remaining operating life of the mine;
- Inadequate flexibility to consider innovative closure technologies that might reduce costs; and
- The use of blanket formulae that do not give adequate consideration of site-specific features that affect the cost of closure and reclamation.

Annex 1 of the document contains some options for financial assurance:

Options	Description	Advantages	Disadvantages
Third Party Guarantee	Includes unconditional bank guarantee and insurance bonds. All are required to be unconditional and/or irrevocable.	Relatively inexpensive (usually between 1 and 1.5% of amount) for the operator to establish Has full backing of financial institution (funds available ‘on demand’) Transparent and operationspecific Cannot normally be unilaterally withdrawn by the issuer Can be altered as requirements change	Often considered by financial institution to be part of working capital, thereby reducing available operating funds

<p>Cash deposit</p>	<p>Normally deposited direct with government and only usually accepted for "small" operations.</p>	<p>Provides an advantage to the government which has direct control over funds and has sole responsibility for making funds available if required The cash is returned to the company, normally on completion of closure works</p>	<p>Providing cash 'upfront' is a financial impediment to the operator and potential loss of income through interest on funds If operator goes bankrupt cash may be classed as a company asset and available to all creditors Government must have a system to ensure segregation of funds for their intended use</p>
<p>Letter of credit</p>	<p>A form of third party guarantee which normally has a one year term, usually extended following review by the issuer. If not extended the beneficiary (government) is notified and has the option of drawing down the full value.</p>	<p>Relatively inexpensive for the operator to establish</p>	<p>Can be unilaterally withdrawn by the issuer at the end of the credit term May restrict company access to other credit</p>
<p>Trust fund</p>	<p>Administered by a third party trustee with a defined investment policy. Intended to cover the costs of a specific closure plan through a structured series of contributions. Surplus funds are returned to the operator.</p>	<p>The Fund is visible to government (and the public) Any surplus after the completion of the closure/ decommissioning plan are returned to the operator</p>	<p>A transition period is required to allow the operator to build up the fund Administrative requirements (similar to a pension fund) can be cumbersome</p>
<p>Insurance policy</p>	<p>Several jurisdictions nominate this as an acceptable method of providing financial assurance..</p>	<p>Relatively inexpensive for the operator to establish Less administration required than with a cash trust fund</p>	<p>Only valid if annual premium paid Recourse to financial assurance often takes place some years after the operator becomes inactive and is unable to pay the premium</p>

'Soft' options	Examples of soft options include: Financial strength rating (where a company is rated as investment grade); Self-funding; Financial test (e.g. balance sheet test); Corporate guarantee based on financial grade; Parent company guarantees; Pledge of assets.	Does not involve direct costs Relatively inexpensive for the operator to establish	Does not provide the same level of security as hard forms of assurance
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In terms of standard accounting and reporting practices applicable to listed entities, the Project is required to recognise a provision for the restoration, rehabilitation and environmental costs arising from damage caused by the development and ongoing production related activities associated with the Project. Accounting standards make a distinction between decommissioning costs and restoration costs as follows:

- Decommissioning costs are those costs which must be incurred to make good the environmental damage caused at the pre-production stage; and
- Restoration costs which are those costs related to making good damage associated with the ongoing operation of the Project.

The project will follow appropriate accounting guidelines for recognizing liabilities and asset retirement obligations. Furthermore the project will develop a schedule for recognizing the incurrence of closure obligations, and a schedule for retiring the obligations. MPC is required to follow the OHADA rules of accounting practice.

During the construction phase and before income is produced, MPC will provide insurance to cover the costs of closure. This will cover the period up until the second half of 2012 according to the Financial Model.

Once net earnings (or net income, the terms are synonymous), other provisions will be made.

The Potash Investment Agreement (PIA) is an agreement between the Republic of Congo, MagIndustries and the operating company MPC which sets out the legal framework for and the conditions under which the Project will operate.

There are two requirements for funding provisions for rehabilitation identified in the PIA which was signed on 22<sup>nd</sup> December 2008.

Section 14 of the PIA is concerned with the Protection of the Environment and Cultural Heritage. Clause 14.1 states:

*“For the purpose of the complete rehabilitation of the Mining and Industrial Zones, the Operating Company is authorised to create a provision for the rehabilitation being an annual fixed sum which shall be set out by the board of directors and deductible from the net operation results calculated before income tax deductions. The Operating Company is authorised to open a bank account at the Bank of Central African States (BCAS) and/or a leading bank established in the Republic of Congo where it shall be entitled to transfer the corresponding amount.”*

These figures have been agreed with the Government as 1% per year to a max of \$2.5M. The decommissioning deposit only needs to start (as per a contractual obligation with the government) after year 10 of production. The total decommissioning deposits are \$23.4 million over years 10-20 of the project.

Section 28 relating to Tax provisions, clause G, states:

***“Provision for the protection of the environment:*** *The Operating Company shall constitute a provision for the protection of the environment pursuant to Article 162, para 5 of the Mining Code; such provision shall not exceed two million dollars per accounting year. Payments of 2.5% of the net earnings from the marketing of the Marketable Products calculated after the payment of CIT shall be opened in the name of the Operating Company, in the Republic of Congo or abroad which may be pledged or otherwise become the object of security in favour of the Lenders. The amounts drawn on this account shall be used solely for the purposes of financing the protection and rehabilitation of the environment.”*

In the current financial model the 2.5% is set at a maximum of \$2M every year, therefore \$40M is contributed over the operating life of the project.

There is also \$150K per year for “training” contributed to the government which totals \$3M over the 20 year project life

The requirements for Closure funding imposed by the PIA are far greater than estimated closure costs, even with inflation. The balance of this money, which may amount to the whole of the 2.5% payments, will be used to address issues such as the social aspects of closure and to continue the activities of the Foundation beyond the life of the mine.

As this is a conceptual closure plan and none of these payments will be made until after construction, over three years from now, the specific details relating to these funds have not yet been developed. The accounting requirements and uses of these funds will be developed by MPC internally in due course, as the remainder of the issues in the PIA are addressed.

## 16. REFERENCES

IFC Environmental, Health, and Safety Guidelines Mining, Dec 10 2007

ICMM Guidance Paper on Financial Assurance for Mine Reclamation and Closure 2006

ICMM Planning for Integrated Mine Closure :Toolkit 2008

Mining for closure – Policies and guidelines for sustainable mining practices and closure of mines; UNEP, UNDP, NATO, OSCE, 2005.

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