

# REHABILITATION AND CLOSURE PLAN FOR PROSPECTING FOR COAL AT DUNDEE IN KWAZULU NATAL PROVINCE



**DMR Ref: KZN 30/5/1/1/2/10807 PR**  
**FOR PUBLIC REVIEW**

<b>BASIA ENVIRONMENTAL CONSULTANT</b>	<b>KE NYAKA BONA KA MAHLO TRADING</b>
Name: Mr Tshia Malehase (Pr.Sci.Na)	Name: Mrs Mary Phillips
Email: <a href="mailto:malehasat@gmail.com">malehasat@gmail.com</a>	Email: <a href="mailto:mary.phillips.co.za@gmail.com">mary.phillips.co.za@gmail.com</a>
Contact: 079 2630 597	Contact: 0716476822
Fax: 086 2264 397	Fax: 084 550 6723

## Executive summary

**Ke Nyaka Bona ka Mahlo Trading** appointed **Basia Environmental Consultant (BEC)** as the independent Environmental Assessment Practitioner (EAP) to compile a Rehabilitation and Closure Plan, as well as financial provision for its proposed prospecting activities. The prospecting activity will be undertaken in Dundee location in Kwazulu Natal province. The location is under Amajuba District Municipality on the following farm portions:

Portion 1, 2, 3, 4, 8, 9 & Remaining Extent of ALLETTA 4350 GT, Portion 7 of MORGENSTOND 3347 GT, Portion 1 & Remaining Extent of MOUNTAIN TOP 8954 GT, Remaining Extent of ST CUTHBERTS 12444 GT.

This document supplies the Department of Mineral Resources (DMR) with information pertaining to closure planning for the proposed prospecting as required in terms of the National Environmental Management Act 107 of 1998 (NEMA) and the Mineral and Petroleum Resources Development Act 28 of 2002.

The contents of this Rehabilitation and Closure Plan has been prepared as per the requirements of Appendix 5 of the NEMA EIA Regulations of 2014 (GNR 982 and GNR 327) and as stipulated under Appendix 4 of GNR 1147.

The proposed prospecting activities will be conducted in the following phases:

- Site Preparation
- Invasive drilling, trenching, pitting , bulk sampling and concurrent rehabilitation
- Final decommissioning, rehabilitation and closure

The proposed area is a typical farmsteads and rural settlement characterized by subsistence farming, an array of livestock farming. The soil agricultural potential of the area varies but may fall within six main ratings, ranging from high potential to very low potential land. However, the larger percentage of land, about 70% can be considered as moderate agricultural land, particularly with regards to crop production.

The aim for closure will be to return the disturbed prospecting target areas to their natural state. It is important to rehabilitate disturbed areas to ensure a safe and stable land use after prospecting for humans, wild animals and livestock.

## Summary of rehabilitation and closure actions

Rehabilitation actions for the proposed prospecting activities would be undertaken in two phases namely concurrent rehabilitation and afterwards final decommissioning and rehabilitation. Concurrent rehabilitation would include:

- Sealing of drill holes
- Backfilling of sumps, pits and trenches
- Clean up of surrounding areas, pollution and waste materials

- Spread overburden and topsoil evenly and re-vegetate disturbed areas to finalise the rehabilitation
- Inspect rehabilitated areas to monitor re-vegetation rate and remove alien invader species that may establish in the area;

Final decommissioning and rehabilitation:

- Remove all temporary infrastructure from the site camp and at prospecting sites
- Rip and seed disturbed areas
- Inspect rehabilitated areas to monitor re-vegetation rate as well as to remove alien invader species

It is recommended that concurrent rehabilitation is undertaken to improve the success of rehabilitation. The rehabilitated areas must be monitored to ensure that the objectives of rehabilitation are met and correct rehabilitation process is followed.

The 2018 financial provision estimate was calculated by means of the DMR standard method for assessment of closure. The cost for rehabilitation and closure of the proposed prospecting activities according to DMR methodology and rates is R 239 9993.00 including Preliminary and General, Contingency and Value added Tax (VAT). However, DMR will make the final determination of rehabilitation costs.

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## **1. Introduction**

Mine rehabilitation is a long-term process, which should ideally begin during the planning phase of a mine development. Mine closure should aim to achieve long-term site stability and the establishment of a self-sustaining ecosystem. The objective of the rehabilitation plan is to ensure activities associated with the mining activities will be designed to prevent, minimise or mitigate adverse long-term environmental and social impacts and create a self-sustaining ecosystem

Ke Nyaka Bona ka Mahlo Trading appointed Basia Environmental Consultant (BEC) as the independent Environmental Assessment Practitioner (EAP) to compile a Rehabilitation and Closure Plan, as well as financial provision for its proposed prospecting activities. The prospecting activity will be undertaken in Dundee location in Kwazulu Natal province. The location is under Amajuba District Municipality on the following farm portions:

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### **1.2. Project description**

Prospecting activities will include establishing a main prospecting site for drilling, sample storage, camping site etc. Prospecting at the area will include:

- 100 drill holes (drill pads, excavation, lining of drill water sump)
- Site camp, ablution facilities, site office, equipment storage

More details of the project are entailed in the BAR & EMP report.

## **2. Requirements for a Rehabilitation and Closure Plan**

Mining in South Africa is renowned as a key element of economic development. However, this significant economic development is shadowed by the environmental damage caused by the mining operations. The disturbance of the natural environment by the mining industry has triggered the South African government to formulate laws that dictate that miners should pay to remediate the damage they cause.

Relevant legislation governing mine rehabilitation, closure cost assessment (closure provision) and closure planning is described in the Mineral and Petroleum Resources Development Act (Act No. 28 of 2002) (MPRDA). Section 41 (1) of the Mineral and Petroleum Resources Development Act (MPRDA), (28 of 2002) states that, *“an applicant for a prospecting right, mining right or mining permit must, before the Minister approves the environmental management plan or environmental management programme in terms of section 39(4), make the prescribed “financial provision” for the rehabilitation or management of negative environmental impacts.”*

The sections 43(1), 43(4), 43(5), 43 (7) and 43(8) relate to the principles of rehabilitation and closure for any right issued under the MPRDA. The MPRDA regulation such as 51(a)(i), 54(1,2), 56(a-k) are also relevant.

In terms of the National Environmental Management Act 107 of 1998 (NEMA) section 24(P), as amended by the National Environmental Management Laws Amendment Act, 2014 (Act No 25 of 2014) (NEMLA) provides that the holder of a mining right must make financial provision for rehabilitation of negative environmental impacts.

In terms of Regulation GNR 940 promulgated on 31 October 2014 and GNR. 1147 of 20 November 2015, the scope of Financial Provision for Rehabilitation must comprise:

- Rehabilitation and remediation annually
- Decommissioning and closure activities at the end of prospecting
- Remediation and management of latent / residual environmental impacts which may become known in future

This report must be submitted with the Environmental Impact Report (EIR) and Environmental Management Programme (EMPr) for authorisation of the prospecting right activity. This document has been prepared in line with Appendix 5 of the NEMA EIA Regulations of 2014 (GNR 982 and GNR 327) and as stipulated under Appendix 4 of the Financial Provision Regulations of 2015 (GNR 1147).

## **2.2. Exploration drilling**

Exploration drilling methods considered include core drilling, reverse circulation or percussion drilling. Areas designated for drill holes, sumps and parking bays will be removed of vegetation and topsoil. The truck mounted drill rig will be placed on site. The drill unit is diesel powered and require storage a low volumes of diesel and oil next to the drill unit. Small sumps would be excavated and lined for the purposes of drilling water. Drill water will be trapped and stored in sumps for reuse in the drilling process. The target areas shall be fenced and temporary cooking and security facilities shall be established.

On completion, drill holes shall be capped by placing a steel casing to a suitable depth and concrete cap on top of the borehole.

## **2.3. Clearing and Stripping of Topsoil**

No plants/trees of conservation importance were observed but conservation important birds, butterfly and baboon spiders may occur onsite. Qualified personnel shall observe the targeted areas for the presence/absence of protected trees. They should be demarcated and protected against damage or destruction. Removal of large individual large tree species must be avoided; where it cannot be avoided, a permit for removal will be obtained from the relevant authority.

## **2.4. Access Roads to be established**

Existing access roads shall be used as far as possible. Single lane access tracks may be created for in and egress from the targeted areas. Minimal to no vegetation clearance shall be undertaken for these purposes. No access track shall be created through a wetland, stream or any riparian zone. Uphold a 50 metre buffer zone regarded a no-go area for prospecting to riparian areas and wetlands.

### **3. Rehabilitation and closure plan**

Prospecting Rehabilitation Plan aims to inform on the actions required to rehabilitate the prospecting right target areas to ensure a socially and environmentally safe and sustainable area. The Rehabilitation Plan consists of direct activities that will be done where natural area has been disturbed during prospecting activity.

#### **3.1. Aims and Objectives of Rehabilitation and Closure Plan**

Rehabilitation and closure is an integral part of all prospecting and mining operations and having a plan serves as a roadmap to direct, refine and implement closure at the end of prospecting/mining. It ensures that the integrity of the environment is sustained after prospecting/mining operations have ceased. The implementation of this concept also reduced the financial burden of rehabilitation and closure. The main objectives for rehabilitation and closure include:

- Make all areas safe for humans, wild animals and livestock;
- Prevent soil, surface and groundwater contamination by managing water on site;
- Minimise negative impacts;
- Establish a sustainable cover to prevent erosion and enhance ecological succession;
- Maintain and restore biodiversity levels to provide appropriate habitat for fauna utilisation;
- Protected drainage lines and watercourses
- Not leave any infrastructure onsite;
- Use approved sites for safe disposal of all wastes
- Maintain Traditional Owners access to areas of cultural & heritage significance
- Monitor key environmental variables (i.e. soils, erosion, vegetation) to demonstrate stability of rehabilitated areas
- Adhere to all statutory and other legal requirements

The closure aim would be to return the disturbed prospecting target areas to their natural state for conservation/grazing. It is important to rehabilitate disturbed areas to ensure a safe and stable land use after prospecting for humans, wild animals and livestock.

#### **3.2. Closure Period and Post Closure Requirements**

The closure period is the period between stopping of prospecting activities and the completion of active rehabilitation actions on the disturbed target areas. The nature of prospecting is of such that closure may be implemented for individual trenches and boreholes as and when analysis ends.

The closure options together with monitoring over a 2 year post closure period, will achieve the stipulated closure objective. This closure option is in line with the requirements of the MPRDA Regulations. Following successful completion of the closure actions it is suggested that a further post closure period of 2 years be assigned to monitor the success of closure. The post closure monitoring will include:

- Inspection of drill hole caps;
- Inspect and remedy any erosion around rehabilitated trench, drill sites
- Inspect rehabilitated areas re-vegetation rate
- Remove alien invader species

### **3.3. Rehabilitation and Closure**

The clearing of soil surface areas would be restricted to what is really necessary for prospecting and construction/establishment of infrastructure. During rehabilitation and closure of these sites, or where vegetation is lacking or compacted, the areas would be ripped or ploughed and levelled in order to re-establish a growth medium and if necessary fertilise to ensure the regrowth of vegetation and the soil ameliorated based on a fertiliser recommendation (soil sample analysed).

As the project progresses there will be an increase in topsoil surface area disturbed initially but also concurrent rehabilitation will take place which involves the replacement of topsoil on backfilled pits and trench areas. All drill holes and trenches will be rehabilitated after drilling and sampling activities have been completed to avoid risk of fauna, livestock falling into open drill holes and trenches.

The disturbed sites shall be returned as closely as possible to the original state.

### **3.4. Rehabilitation of access roads**

- Existing roads will be used as far as possible;
- Whenever the prospecting right is suspended/cancelled or lapses such access road shall be rehabilitated to the satisfaction of the Regional Manager;
- Any gate or fence set up by the holder shall be removed and situation restored to the pre-prospecting state;
- Any temporary roads created, single track or formal shall be ripped or ploughed, and where necessary fertiliser (based on soil analysis) applied to ensure the regrowth of vegetation;
- If reasonable assessment indicates that re-establishment of vegetation is unacceptably slow the Regional Manager may require that the soil be analysed and any deleterious effects on the soil arising from the prospecting operation, be correct and the area be seeded with seed mix to Regional Managers specification;

### **3.5. Rehabilitation of surface trenches/pits and drill holes**

On completion of operations, all structures or objects at the site camp shall be dealt with in accordance with Section 44 of the MPRDA. After all foreign matter has been removed from site; excavations shall be backfilled with subsoil, compacted and levelled with previously stored topsoil. No foreign matter such as cement or other rubble shall be introduced into such backfilling.

On completion of the prospecting operation, the areas shall be cleared of any contaminated soil. The surface shall then be ripped or ploughed to a depth of at least 300mm (Mispah soils limited in depth to 300mm) and the topsoil previously stored adjacent to excavations, shall be spread evenly to its original depth over the whole area. The area shall then be fertilised if necessary. The site shall be seeded with a vegetation seed mix adapted to reflect the local indigenous flora. Where sites have been rendered devoid of vegetation or where soils have been compacted by heavy machinery, the surface shall be scarified and ripped.

Drill holes shall be capped by placing a steel casing to a suitable depth and concrete cap on top of the borehole.

Photographs of the different prospecting target sites, before, during mining and after rehabilitation and closure, will be taken at selected fixed points and kept on record for regional manager's information.



Rehabilitation of the new landscape would be done in such a manner to blend in with the surrounding landscape and allow normal surface drainage to continue. Water control systems must be implemented to prevent erosion.

The visual impact would be addressed by means of:

- Re-vegetation with grasses
- Removal of any infrastructure, scrap, waste that would contribute to a negative impact.

### **3.6. Fertilising of Areas to be rehabilitated**

If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, it may be required that soil be analysed and any effects from prospecting be corrected and the area be seeded with a seed mix to his or her specification.

Please note that the Limpopo Ridge bushveld vegetation type has a poor ground layer in terms of grasses. Therefore seeding mixture would be derived from common grasses found in the Mopane Bushveld type.

### **3.7. Seeding of Grass Seed Mixture and planting of Woody Species**

The seed mix must therefore take into account the availability of indigenous grass seeds as per the above, different soil situations and the prevailing climatic conditions of the area. The herbaceous layer of the affected Northern KwaZulu-Natal Moist Grassland; KwaZulu-Natal Highland Thornville and the Low Escarpment Moist Grassland.

### **3.8. Demolition / Removal of infrastructure**

On completion of operations all structures or other infrastructure on the prospecting terrain shall be dealt with in accordance with Section 44 of the MPRDA.

### **3.9. Monitoring and Maintenance**

The post-monitoring period following decommissioning of prospecting activities must be implemented by a suitable qualified independent party for a minimum of 2 years unless otherwise specified by the DMR. The monitoring activities during this period would include:

- Inspection of drill hole caps
- Inspect and remedy of erosion around rehabilitated trench and drill sites
- Inspect rehabilitated areas re-vegetation rate
- Remove alien invader species

Provision must be made to monitor any unforeseen impact that may arise as a result of the proposed prospecting activities and incorporated into post closure monitoring and management.

### **3.10. Post Closure Monitoring and Maintenance**

Prior to decommissioning and rehabilitation activities, a monitoring programme shall be developed and submitted to the DMR for approval, as part of the Final Rehabilitation Plan. The programme is to include proposed monitoring during and after the closure of prospecting sites. It is recommended that post-closure monitoring include the following:

- Confirm all de-contaminated sites are free of latent pollution after decommissioning;
- Confirm all waste, wastewater or other pollutants generated as a result of decommissioning will be managed appropriately, as per requirements of the Final Rehabilitation Plan;
- Confirm acceptable cover has been achieved in areas where indigenous vegetation is re-established;
- Confirm that trench, pit and drill hole sites (all prospecting target areas) are safe and not a potential hazard for humans, wild animals or livestock.

Annual Environmental Report will be submitted to the DMR at least one year post decommissioning. The monitoring reports shall include a list of any remedial action required to ensure that the site remains safe and pollution free after infrastructure has been removed and alien invader species free.

#### 4. Environmental Indicators

Table 1: Measures to rehabilitate the affected environment

Activities	Phase	Size and scale of disturbance	Mitigation measures	Compliance with standard	Time period for implementation
Drill hole closure	Decommissioning and closure	Short-term and localised	<p>All prospecting drillholes should be plugged and sealed with cement.</p> <p>Cement and liquid concrete are hazardous to the natural environment on account of the very high pH of the material and the chemicals contained therein. As a result, the contractor shall ensure that</p> <p>Concrete shall not be mixed directly on the ground</p> <p>The visible remains of concrete either solid or from washings, shall be physically removed immediately and disposed of as waste. Washing of visible signs into the ground is not acceptable</p> <p>All excess aggregate shall also be removed</p>	NWA DWF BPG	Throughout decommissioning and closure
Removal of surface infrastructure	Decommissioning	Short-term and localised	<p>All infrastructure, equipment and other items used during prospecting will be removed from the site</p> <p>Compaction of soil must be avoided as far as possible. The use of heavy machinery must be restricted in areas outside of the proposed prospecting sites to reduce the compaction of soils</p>	MPRDA Rehabilitation Plan	Decommissioning
Removal of waste (General and hazardous waste)	Decommissioning	Small scale and localised	<p>Any excess or waste material or chemicals including drilling muds etc. must be removed from the site and must preferably be recycled (e.g. oil and other hydrocarbon waste products). Any waste materials or chemicals that cannot be recycled must be disposed of at a suitably licensed waste facility</p>	NWA DWF BPG	Decommissioning

Activities	Phase	Size and scale of disturbance	Mitigation measures	Compliance with standard	Time period for implementation
Monitoring	Post-operation	All rehabilitation	<p>The post-operational monitoring and management period following decommissioning of prospecting activities must be implemented by a suitable qualified independent party for a minimum of two (2) years unless otherwise specified by the competent authority</p> <p>The monitoring activities during this period will include but are not limited to:</p> <p>Biodiversity monitoring</p> <p>Re-vegetation of disturbed areas where required</p> <p>Provision must be made to monitor any unforeseen impact that may arise as a result of the proposed prospecting activities and incorporated into post closure monitoring and management</p>	MPRDA Rehabilitation Plan	Post -operation

## **5. Managerial Capacity**

The applicant will be responsible for ensuring compliance with all the provisions of the prospecting right and supporting plans. The Applicant must have the knowledge and understanding of the applicable legislation and guidelines. The applicant must where necessary appoint suitably qualified specialists, engineers and other internal and external resources to comply with the applicable commitments and requirements. The applicant must also ensure that suitable communication avenues are in place with local communities and relevant stakeholders.

An independent Environmental Assessment Practitioner shall be appointed to ensure compliance with requirements of the Final Rehabilitation, Decommissioning and Closure Plan and to undertake the following tasks:

- Conduct pre-closure environmental site assessment, risk assessment and landowner consultation
- Compile a site specific final closure and decommissioning plan;
- Conduct periodic compliance monitoring and reporting during closure.

Prospecting Contractor who has relevant experience in prospecting. The contractor must have experience in prospecting site closure as well as closure standards and guidelines. This contractor would be responsible for ensuring the closure plan is implemented and to ensure that environmental and social risks are prevented or minimised.

## **6. Relinquishment Criteria**

The end land use is natural / grazing as the study site is covered in pristine indigenous vegetation and is a declared nature reserve.

The relinquishment criteria therefore include:

- No waste materials must have remained on site
- The vegetation cover of the disturbed target sites must be consistent with the surrounding vegetation cover, biodiversity levels restored and no faunal mortalities due to prospecting.
- All complaints registered during the prospecting and closure must have been addressed

## **7. Closure cost calculation**

This Financial Provision Calculation has been undertaken as per the Department of Mineral Resource (DMR) "Guideline Document for Evaluation of the Quantum of Closure Related Financial Provision Provided by a Mine" published in January 2005. The DMR Guideline format makes use of a set template for which defined rates and multiplication factors are used. The multiplication and weighting factors which ultimately define the rate to be used are determined by amongst others the topography, classification of the mine according to the mineral mined, the risk class of the mine and its proximity to built-up or urban areas. The 2005 DMR Master Rates were updated and published by the DMR in 2012 however, due to inflation, these are no longer accurate. An average inflation of 6% was used to reflect 2018 costs.

## **7.2. DMR Classification**

The DMR Guideline Document classifies a mine/activity according to a number of factors which allows one to determine the appropriate weighing factors to be used during the quantum calculation which include:

- Mineral mined/explored
- Risk class of mine/operation
- Environmental sensitivity of site
- Type of operation proposed
- Geographic location

Once the risk class (Class A, B or C) and the sensitivity of the area where the mine is located (, High Medium, Low) had been determined using the appropriate tables the unit rates for the applicable closure components were identified. The primary risk class is categorised as Class A (High Risk), Class B (Medium Risk) or Class C (Low Risk). Prospecting sampling can be considered as Class C – Low Risk operation. The study site sensitivity was determined by establishing the overall sensitivity of the area by accepting the most sensitive of the three (biophysical, social, and economic).

In terms of biophysical the site is of low sensitivity due to it being largely natural with a vibrant fauna and flora and as it forms part of an overall ecological regime of conservation value. From a social perspective, the site is of medium sensitivity due to local communities being within sighting distance of some of the target areas. The overall activity class is to be Class C.

### 7.3. Summary of financial provision

Table 2: Financial Provision Calculation

No.	Description	Unit	A	B	C	D	E=A*B*C*D
			Quantity	Master Rate	Multiplication factor	Weighting factor 1	Amount (Rands)
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m3	0	13,77	1	1	0
2 (A)	Demolition of steel buildings and structures	m2	0	181,45	1	1	0
2(B)	Demolition of reinforced concrete buildings and structures	m2	0	267,39	1	1	0
3	Rehabilitation of access roads	m2	40	32,46	1	1	1298,4
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	315,14	1	1	0
4 (A)	Demolition and rehabilitation of non-electrified railway lines	m	0	172	1	1	0
5	Demolition of housing and/or administration facilities	m2	20	363	1	1	7260
6	Opencast rehabilitation including final voids and ramps	ha		184693	1	1	0
7	Sealing of shafts adits and inclines	m3	0,1	97,5	1	1	9,75
8 (A)	Rehabilitation of overburden and spoils	ha	0,2	126822	1	1	25364,4
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha		157954	1	1	0
8 ( C )	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0,2	458771	1	1	91754,2
9	Rehabilitation of subsided areas	ha	0	106194	1	1	0
10	General surface rehabilitation	ha	0,4	100464	1	1	40185,6
11	River diversions	ha	0	100464	1	1	0
12	Fencing	m	0	115	1	1	0
13	Water management	ha	0	38199	1	1	0
14	2 to 3 years of maintenance and aftercare	ha	0,5	13370	1	1	6685
15 (A)	Specialist study	Sum	0	100000	1	1	0
15 (B)	Specialist study	Sum	0	100000	1	1	0
Sub Total 1							172557,35

  

1	Preliminary and General	20706,882	weighting factor 2	20706,882
			1	
2	Contingencies		17255,735	17255,735
Subtotal 2				210519,97
VAT (14%)				29472,80
Grand Total				239993

## **8. Closure monitoring, auditing and reporting**

Monitoring is of ultimate importance as closure will only be obtained once evidence can be presented to the DMR that the closure objectives have been achieved and that closure plans have been effectively implemented and rehabilitation is sustained.

The mechanisms that will be applied to monitor the success of the EMPr include:

- Performance Assessment Report of the EMPr and Closure Plan
- Physical monitoring
- Compliance Audits
- Addressing external complaints, incident reporting

The Project Geologist, normally, will be responsible for daily monitoring. Internal monthly and annual performance assessment would be conducted of which records would be kept to inform an annual Performance Assessment Report of the EMPr and Closure Plan which will be submitted to the DMR. An external audit in the form of an EMPr Performance Assessment will be conducted every two years by an independent consultant and submitted to the DMR.

According to Regulation 34 of the NEMA EIA Regulations of 2014, the holder of an environmental authorisation must for the period during which the environmental authorisation, EMPr and Closure Plan remain valid:

- Ensure compliance with the conditions of the environmental authorisation and the EMPr and where applicable the closure plan, is audited and;
- Submit an environmental audit report to the relevant competent authority.

## **9. Recommendations**

### **9.1. Compliance with Closure Plan**

The closure objectives can only be achieved by fulfilling the responsibilities as set out in the rehabilitation plan. Closure objectives cannot be achieved if the actions of the rehabilitation plan are not complied with resulting in an unsuccessful closure plan.

### **9.2. Annual update requirements of the plan**

The closure plan must be reviewed annually and updated as and when major changes are effected to the Prospecting Works Programme.

### **9.3. On-site documents**

The closure plan must be available onsite as per the requirements of Regulation 26 (h) of NEMA EIA Regulations of 2014.