



**CONSTRUCTION MATERIALS &
INDUSTRIAL MINERALS FOR
SOUTHERN AFRICA**

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**DETERMINATION OF QUANTUM
FOR FINANCIAL PROVISION
FOR MINE CLOSURE
REHABILITATION AT
Cape Lime (PTY) LTD**

WC 30/5/1/2/2/ 294MR

ACCORDING TO SECTION 24P OF NEMA AND REGULATION 54 OF THE REGULATIONS:
MINERALS AND PETROLEUM RESOURCES
DEVELOPMENT ACT (ACT NO 28 OF 2002)

05 December 2019

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For:

DMR Western Cape

Contents

Introduction.....	3
Existing Financial Provision:	3
Closure Objectives	4
Quantum calculation Methodology	5
Descriptions of mining operations.....	5
Step 1: Determine Primary Mineral and Saleable mineral by-products	7
Step 2: Determine the risk class associated with the mineral.....	7
Step 3: Determine the area Sensitivity.	7
Step 4:	7
Step 4.1: Determine level of information:	8
Step 4.2: Determine the closure components:	8
Step 4.3: Determine the Unit rates for closure components	9
Step 4.4: Determine and Apply weighting factor	9
Step 4.5: Identify areas of disturbance	10
Step 4.6: Quantum calculation for Rehabilitation.....	11
Conclusion.....	11

Introduction

According to section 24P of NEMA and the regulations set out in the Mineral and Petroleum Resources Development Act (Act No. 28 of 2002) (MPRDA), it is necessary for Cape Lime (PTY) LTD to compile a closure cost estimate for their existing dolomite mine, and to update this on a regular, specified basis. The financial provision for the environmental rehabilitation and closure of any mine and its associated mining operations forms an integral part of SECTION 24P OF NEMA AND MPRDA, and is addressed in Sections 41(1), 41(2), 41(3) and 45 of the Act. The cost updating process is based on the available figures as per the mine layout drawing (*Figure 1*) and Mine Description (*Chapter 3*) and additional Project information provided by Cape Lime (PTY) LTD

According to Regulation 56 (Principles for Mine Closure) of the MPRDA in the Government Gazette Vol. 466 No. 26275, the holder of a prospecting right, mining right, retention permit or mining permit must ensure that prospecting or mining operations are closed efficiently and cost effectively. According to South African legislation, regulations published in terms of the Minerals Act (Act No. 50 of 1991 (i.e. regulations 5.16.1 to 5.16.4) requires the holder of a mining authorization to:

- Compile Environmental Management Programmes that indicate adequate financial means in terms of both sufficient and acceptable pecuniary provision to the satisfaction of the DMR; and
- Annually, to the satisfaction of the DMR, and in consultation with an expert, determine the quantum of pecuniary provision.

The "***Guideline Document for the Evaluation for the Quantum of Closure Related to Financial Provision Provided by a Mine***"^h, was developed by the DMR in September 2004 (Report No. 5863-5900-2-P, Rev 1.6), and was updated in January 2005, in order to empower the personnel at Regional DMR offices to review the quantum determination for the rehabilitation and closure of mining sites. This document was used in the determination of the closure cost estimation for Cape Lime (PTY) LTD, together with Mine-specific data and quantities received from Cape Lime (PTY) LTD

Existing Financial Provision:

The mine has an existing rehabilitation fund in the form of a financial guarantee to the amount of R 1 600 000 (**One Million and Six Hundred Thousand Rand**)

Closure Objectives

The closure objective proposal for the end land use of the mining area is to rehabilitate the land to a non-hazardous waste disposal site or a recreational dam.



Locality Map: Vredendal Mining Area
DMR Reference Number: WC 30/5/1/2/2/294 MR



Quantum calculation Methodology

The "**Guideline Document for the Evaluation for the Quantum of Closure Related to Financial Provision Provided by a Mine**" was used as the primary guideline to quantify the Quarry's closure cost estimate. As mentioned above, technical data and infrastructure quantities were supplied by Cape Line (PTY) LTD Quarries. The guideline document is generic in nature and cannot answer all mining scenarios or deal with all situations relating to financial provision, rehabilitation and mine closure. Further advice and/or experience has been obtained from the existing Afrimat aggregates mining operations and based on circumstances that prevail at other mine sites, to fully assess the quantum for financial provision. The guideline document covers the most essential closure components that are generally required for the closure of a mine site. Site-specific conditions were also considered.

The following closure components are suggested by the DMR for determining the quantum for financial provision:

- Dismantling of process plant and related structures;
- Demolition of steel structures;
- Demolition of reinforced concrete buildings and structures;
- Rehabilitation of access roads;
- Demolition of housing facilities;
- Opencast rehabilitation including final voids and ramps;
- Sealing of vertical and incline shafts;

- Rehabilitation of overburden and spoil stockpiles;
- Rehabilitation of process waste deposits and evaporation ponds;
- Rehabilitation of subsided areas;
- General surface rehabilitation, including grassing of all denuded areas;
- River diversions;
- Fencing;
- Water management (separating clean and dirty water, management of polluted water and managing the impacts on groundwater); and
- Maintenance and aftercare

A master rate for each closure component is provided in the DMR guideline, and a multiplication factor is applied to the master rate (depending on the risk class and the area sensitivity). The master rate for each closure component is based on the "generally accepted closure methods". It is important to note that this rate was approved in 2005 and therefore needs to be updated based on appropriate CPIX.

The next step was to determine and apply the appropriate weighting factors, based on the specific mine location. The two applicable weighting factors include:

- **Weighting Factor 1 (dependent on the nature of the terrain where the mine is located)**
- this factor is applicable as it is more difficult (and hence more costly) to undertake work related to mine closure in areas that are undulating or rugged. As such, weighting factor 1 was applied to each of the closure components
- **Weighting Factor 2 (relates to the proximity of the mine to an urban centre)** - this factor is applicable as there will be increased costs to transport machinery, goods and personnel to more remote mine sites. As such, weighting factor 2 was applied to each of the closure components.

Descriptions of mining operations

The mining process entails removal of overburden to expose the ore before drilling and blasting takes place according to a structured mine plan. Excavation of blasted material is done by an Excavator and 18 ton trucks haul the material to the primary crushing plant. The primary crushing and screening facility produce feed stock for the fillers, glass dolomite and limestone processing plants. The rest of the material produced at the primary crushing facility is used for the aggregates markets. The limestone processing plant also produces feed for the fluid bed kiln. After calcining of the limestone in the kiln it is further processed and hydrated to service a variety of markets

The following steps are in accordance with the requirements of the DMR issued guideline to determine the rehabilitation fund quantum.

Step 1: Determine Primary Mineral and Saleable mineral by-products

Limestone
and Dolomite

Step 2: Determine the risk class associated with the mineral

C

Step 3: Determine the area Sensitivity.

low

The sensitivity of the area was classified as (as per table B.3 from the guidelines) due to the following reasons:

- Any Biophysical
- Any Social
- Any economical reason

Step 4:

Step 4.1: Determine level of information:

The information in place must be seen extensive as since;

- An Environmental Management Plan as part of an EMPR, as contemplated in section 39 of the MPRDA, has been approved
- A detailed closure plan, based on the EMP, that covers all aspects of rehabilitation and closure of the mine is approved, and
- A detailed breakdown of the costs envisaged for rehabilitation and closure, signed off by a competent person is with this document submitted.

Step 4.2: Determine the closure components:

The following table indicates the closure components considered in determining the quantum calculation for financial provision for immediate closure to obtain the above closure objectives

Applicant:	Cape Lime; WC 30/5/1/2/3/2/1 (294) MR	
No.	Description	Components
1	Dismantling of processing plant and related structures (including overland conveyors and power lines)	Applicable
2 (A)	Demolition of steel buildings and structures	Applicable
2(B)	Demolition of reinforced concrete buildings and structures	Not Applicable
3	Rehabilitation of access roads	Not Applicable
4 (A)	Demolition and rehabilitation of electrified railway lines	Not Applicable
4 (B)	Demolition and rehabilitation of non-electrified railway lines	Not Applicable
5	Demolition of housing and/or administration facilities	Not Applicable
6	Opencast rehabilitation including final voids and ramps	Applicable
7	Sealing of shafts adits and inclines	Not Applicable
8 (A)	Rehabilitation of overburden and spoils	Applicable
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	Not Applicable
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	Not Applicable
9	Rehabilitation of subsided areas	Applicable
10	General surface rehabilitation	Applicable
11	River diversions	Not Applicable
12	Fencing	Not Applicable
13	Water management	Not Applicable
14	2 to 3 years of maintenance and aftercare	Applicable
15 (A)	Specialist study	Applicable
15 (B)	Specialist study	Applicable
1	Preliminary and General	
2	Contingencies	

Step 4.3: Determine the Unit rates for closure components

Now, using risk class C and Medium Sensitivity, the unit rates for each applicable component is calculated from Table B.5 in the guideline. This consists of a Master rate for each component above multiplied by factor for risk class and sensitivity:

The revised master rates used for the closure cost analysis, are based on a compounded inflation rate from 2006 to 2016, as seen below

Year	CPIX
2005	3.4%
2006	4.6%
2007	7.2%
2008	11.5%
2009	7.1%
2010	4.3%
2011	5.0%
2012	5.8%
2013	5.8%
2014	5.8%
2015	6.1%
2016	4.6%
2017	6.4%
2018	4.6%
2019	4.7%

Step 4.4: Determine and Apply weighting factor

Weighting Factor 1:

The nature of the terrain where the mine is located is **FLAT** as per mine plans, therefor the factor used is **1.00**. This factor is applicable as it is more difficult (and hence more costly) to undertake work related to mine closure in areas that are undulating or rugged. Weighting Factor 1 is applied to each of the closure components.

Weighting Factor 2:

The proximity of the mine to an urban centre. This factor is applicable as there will be increased costs to transport machinery, goods and personnel to more remote mine sites. Weighting Factor 2 is applied to the Preliminary and General items only.

Step 4.5: Identify areas of disturbance

The following areas are measured from Google Earth and verified by site visit and is based on current situation. This calculation will be updated every year:

Disturbed area

No.	Description	Unit	Area 1
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m ³	640
2 (A)	Demolition of steel buildings and structures	m ²	0
2(B)	Demolition of reinforced concrete buildings and structures	m ²	0
3	Rehabilitation of access roads	m ²	0
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0
4 (B)	Demolition and rehabilitation of non-electrified railway lines	m	0
5	Demolition of housing and/or administration facilities	m ²	0
6	Opencast rehabilitation including final voids and ramps	ha	34
7	Sealing of shafts adits and inclines	m ³	0
8 (A)	Rehabilitation of overburden and spoils	ha	0.5
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0
9	Rehabilitation of subsided areas	ha	0
10	General surface rehabilitation	ha	5
11	River diversions	ha	0
12	Fencing	m	0
13	Water management	ha	0
14	2 to 3 years of maintenance and aftercare	ha	3
15 (A)	Specialist study	Sum	1
15 (B)	Specialist study	Sum	1

Step 4.6: Quantum calculation for Rehabilitation

The total financial provision to be made Cape Lime (PTY) LTD is: **R1 712 928.60 (One Million Seven Hundred and Twelve Thousand, Nine Hundred and Twenty-Eight Rand and Sixty cents)** including vat. The details of the costs are shown below.

5. Conclusion

Cape Lime (PTY) LTD must make an additional shortfall of **R 112 928.6 (One hundred and Twelve Thousand, Nine Hundred and Twenty-Eight Rand and Six Cents)**.

CALCULATION OF THE QUANTUM								
Applicant :		Cape Lime			Location:			Vredendal
Evaluator:		Tali Tshikhovhokhovho			Date:			Dec 2019
Reference :		WC 30/5/1/2/3/2/1 (294) MR						
		Environmental Parameters						
Risk Class		B						
Area sensitivity		Low						
Nature of terrain		Undulating						
Proximity to Urban Ara		Urban						
No.	Description	Unit	A Quantity	B Master Rate	C Multiplication factor	D Weighting factor 1	E=A*B*C*D Amount (Rands)	
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m3	640	R 15.87	1	1.1	R 11 170.11	
2 (A)	Demolition of steel buildings and structures	m2	0	R 221.02	1	1.1	R 0.00	
2(B)	Demolition of reinforced concrete buildings and structures	m2	0	R 325.71	1	1.1	R 0.00	
3	Rehabilitation of access roads	m2	0	R 39.55	1	1.1	R 0.00	
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	R 383.87	1	1.1	R 0.00	
4 (B)	Demolition and rehabilitation of non-electrified railway lines	m	0	R 209.38	1	1.1	R 0.00	
5	Demolition of housing and/or administration facilities	m2	0	R 442.03	1	1.1	R 0.00	
6	Opencast rehabilitation including final voids and ramps	ha	34	R 224 971.28	0.04	1.1	R 336 557.04	
7	Sealing of shafts adits and inclines	m3	0	R 118.65	1	1.1	R 0.00	
8 (A)	Rehabilitation of overburden and spoils	ha	0.5	R 154 478.73	1	1.1	R 84 963.30	
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0	R 192 400.46	1	1.1	R 0.00	
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0	R 558 822.15	0.55	1.1	R 0.00	
9	Rehabilitation of subsided areas	ha	0	R 129 352.67	1	1.1	R 0.00	
10	General surface rehabilitation	ha	5	R 122 373.21	1	1.1	R 673 052.65	
11	River diversions	ha	0	R 122 373.21	1	1.1	R 0.00	
12	Fencing	m	0	R 139.59	1	1.1	R 0.00	
13	Water management	ha	0	R 46 529.74	0.41	1.1	R 0.00	
14	maintenance and aftercare	ha	3	R 16 285.41	1	1.1	R 53 741.85	
15 (A)	Specialist study	Sum	1	R 27 917.84	1	1.1	R 30 709.63	
15 (B)	Specialist study	Sum	1	R 27 917.84	1	1.1	R 30 709.63	
						Sub Total 1	R 1 220 904.21	
1	Preliminary and General			R 146 508.50	weighting factor 2 1		R 146 508.50	
2	Contingencies			R 122 090.42			R 122 090.42	
						Subtotal 2	R 1 489 503.13	
						VAT (15%)	R 223 425.47	
						Grand Total	R 1 712 928.60	