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CLOSURE AND FINANCIAL PROVISION ASSESSMENT OF SAVUKA 7A & 7B TSF'S AT MPONENG MINE, USING THE DMR GUIDELINES AS AT DECEMBER 2024

**ENVIRONMENTAL IMPACT
MANAGEMENT SERVICES (EIMS)**

P315_Savuka Closure Assessment Report

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1. INTRODUCTION

1.1. Background

MineLock Environmental Engineers (MineLock) was commissioned by Environmental Impact Management Services (EIMS) to develop a DME closure quantum for the Savuka 7a and 7b TSFs at the Golden Core Trade and Invest (Pty) Ltd. - Mponeng Operations (Harmony).

Golden Core Trade and Invest (Pty) Ltd. - Mponeng Operations (Harmony) owns and operates multiple gold mines and processing plants within the West Wits region of Gauteng Province. The Savuka Plant currently disposes of tailings at the Savuka 7a and 7b Tailings Storage Facilities (TSFs). These facilities are situated at coordinates 26°26'11.85"S; 27°21'11.38"E, as illustrated in Figure 1 below.



Figure 1: Google Earth image of the position of Savuka TSFs

The Savuka 7a and 7b TSFs are approaching their final, approved height, while the planned Life of Mine (LOM) for the West Wits region exceeds the current deposition capacity of these facilities. To address this, Harmony is conducting a feasibility assessment to increase the approved height of the Savuka 7a and 7b TSFs by 5 to 10 meters.

MineLock was appointed to assess the closure quantum specifically for the next lift of the Savuka 7A and 7B TSFs. The side slope areas for TSF 7A and 7B were provided by the client as approximately 14 903.15 m² and 6 995.25 m², respectively. A survey of the TSFs, received on 16 January 2025, was used to confirm the approximate area of the side slopes resulting from the first-year height increase (year 2025).

It was confirmed that the existing Savuka 7a and 7b TSFs are already accounted for in the current closure quantum. Therefore, this report focuses only on the additional area associated with the new lift of the TSFs for the year 2025.



2. MINE OVERVIEW

Table 1 presents the infrastructure and features associated with the Savuka 7a and 7b TSFs.

Table 1: Activities as per DMR Guidelines

Component	Description	Applicable
1	Dismantling of processing plant and related structures (incl. overland conveyors and Power lines)	N/A*
2 (A)	Demolition of steel buildings and structures	N/A*
2 (B)	Demolition of reinforced concrete buildings and structures	N/A*
3	Rehabilitation of access roads	N/A*
4 (A)	Demolition and rehabilitation of electrified railway lines	N/A*
4 (B)	Demolition and rehabilitation of non-electrified railway lines	N/A*
5	Demolition of housing and/or administration facilities	N/A*
6	Opencast rehabilitation including final voids and ramps	N/A*
7	Sealing of shafts, adits and inclines	N/A*
8 (A)	Rehabilitation of overburden and spoils	N/A*
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (basic, salt producing waste)	Unscheduled Scenario: Savuka 7a and 7b TSFs
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (acidic, metal-rich waste)	N/A*
9	Rehabilitation of subsided areas	N/A*
10	General surface rehabilitation	N/A*
11	River diversions	N/A*
12	Fencing	N/A**
13	Water management	N/A*
14	2 to 3 years of maintenance and aftercare	All disturbed areas

*assume that existing infrastructure is quantified in Harmony's yearly costing

3. CLOSURE COST ASSESSMENT

This section presents the basis of the calculation of the quantum for financial provisions for closure. The assessment and calculations are based on the 2005 DMR 'Guideline Document for the Evaluation of the Quantum of Closure-Related Financial Provision' provided by a Mine (Department of Mineral Resources, 2005).

3.1 Input parameters for quantum provision

No	Input data
1	Risk ranking for mine type and mineral by-product
2	Environmental sensitivity of the mining area



3	Level of information available
4	Type of mining operation
5	Geographical location of the mine
6	Closure components & Areas of disturbance (Components Map)

3.2 Primary Risk Class for type of minerals mined

Mineral	Ore	Size: Larger if > than (tpm)	Primary risk class			
			Large Mine		Small Mine	
			Mine and mine waste	Mine, mine waste, plant and plant waste	Mine and mine waste	Mine, mine waste, plant and plant waste
Gold		10 000	B	A	B	A

3.3 Risk Class

Determine risk class	
Class A	a high probability of the occurrence of the impact with a severe consequence,
Class B	a moderate probability of occurrence of the impact with a manageable consequence,
Class C	a low probability of occurrence of the impact with a negligible consequence.

3.4 Area Sensitivity

Sensitivity	Area sensitivity		
	Biophysical	Sensitivity criteria Social	Economic
Low	<ul style="list-style-type: none"> Largely disturbed from natural state. Limited natural fauna and flora remains. Exotic plant species evident. Unplanned development. Water resources disturbed and impaired. 	<ul style="list-style-type: none"> The local communities are not within sighting distance of the mining operation. Lightly inhabited area (rural). 	<ul style="list-style-type: none"> The area is insensitive to development. The area is not a major source of income to the local communities.
Medium	<ul style="list-style-type: none"> Mix of natural and exotic fauna and flora. Development is a mix of disturbed and undisturbed areas, within an overall planned framework. Water resources are well controlled. 	<ul style="list-style-type: none"> The local communities are in the proximity of the mining operation (within sighting distance). Peri-urban area with density aligned with a development framework. Area developed with an established 	<ul style="list-style-type: none"> The area has a balanced economic development where a degree of income for the local communities is derived from the area. The economic activity could be influenced by indiscriminate development.



High	<ul style="list-style-type: none"> • Largely in natural state. • Vibrant fauna and flora, with species diversity and abundance matching the nature of the area. • Well planned development. • Area forms part of an overall ecological regime of conservation value. • Water resources emulate their original state. 	<ul style="list-style-type: none"> • The local communities are in close proximity of the mining operation (on the boundary of the mine). • Densely inhabited area (urban/dense settlements). • Developed and well-established communities. 	<ul style="list-style-type: none"> • The local communities derive the bulk of their income directly from the area. • The area is sensitive to development that could compromise the existing economic activity.
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3.5 Closure components

Component No.	Main description	Applicable closure components for mine type		
		Open-cast	Under ground	Combination
1	Dismantling of processing plant and related structures (including overland conveyors and power lines)	No	No	No
2(A)	Demolition of steel buildings and structures	No	No	No
2(B)	Demolition of reinforced concrete buildings and structures	No	No	No
3	Rehabilitation of access roads	No	No	No
4(A)	Demolition and rehabilitation of electrified railway lines	No	No	No
4(B)	Demolition and rehabilitation of non-electrified railway lines	No	No	No
5	Demolition of housing and facilities	No	No	No
6	Opencast rehabilitation including final voids and ramps	No	No	No
7	Sealing of shafts, adits and inclines	No	No	No
8(A)	Rehabilitation of overburden and spoils	No	No	No



Component No.	Main description	Applicable closure components for mine type		
		Open-cast	Under ground	Combination
8(B)	Rehabilitation of processing waste deposits and evaporation ponds (basic, salt-producing waste)	No	No	Yes
8(C)	Rehabilitation of processing waste deposits and evaporation ponds (acidic, metal-rich waste)	No	No	No
9	Rehabilitation of subsided areas	No	No	No
10	General surface rehabilitation, including grassing of all denuded areas	No	No	No
11	River diversions	No	No	No
12	Fencing	No	No	No
13	Water management (Separating clean and dirty water, managing polluted water and managing the impact on groundwater, including treatment, when required)	No	No	No
14	2 to 3 years of maintenance and aftercare	No	No	Yes

3.6 Unit rates for closure components

The components in the DMR guideline that have multiplication factors different than 1 are listed below. It is, however, not necessarily applicable to the costing of this site.

Component 6 - Opencast Rehabilitation:

COMPONENT 6					OPENCAST REHABILITATION	
	UNIT			MASTER RATE		
	ha			R 273 528,48		
	Multiplication factor					
Risk Class (A, B or C)	A	0.04	0.52	1.00		
	B	0.04	0.52	1.00		
	C	0.04	0.52	1.00		
		Low	Medium	High		
	Environmental Sensitivity					

Component 8 (c) - Processing water deposits & Evaporation ponds:



COMPONENT 8 (C) PROCESSING WATER DEPOSITS & EVAPORATION PONDS				
	UNIT			MASTER RATE
	ha			R 679 436,83
	Multiplication factor			
Risk Class (A, B or C)	A	0.59	0.80	1.00
	B	0.55	0.76	0.90
	C	0.51	0.66	0.81
		Low	Medium	High
	Environmental Sensitivity			

Component 13 – Water Management:

COMPONENT 13			WATER MANAGEMENT	
	UNIT		MASTER RATE	
	ha		R 56 572,59	
	Multiplication factor			
Risk Class (A, B or C)	A	0.60	0.67	1.00
	B	0.41	0.60	0.67
	C	0.17	0.25	0.33
		Low	Medium	High
	Environmental Sensitivity			

3.7 Weighting Factor 1 and 2

Weighting factor 1 is applied to all closure components:

Nature of the Terrain/Accessibility	Flat	Undulating	Rugged
Weighting Factor 1	1.00	1.10	1.20

Weighting factor 2 is applied to preliminary and general item only:

Proximity to urban area where goods and services are supplied	Urban	Peri-urban	Remote
Weighting Factor 2	1.00	1.05	1.10

3.8 Escalation

In South Africa, the Consumer Price Index or CPI measures changes in the prices paid by consumers for a basket of goods and services and is published Stats SA (Consumer Price Index, Statistical Release P0141).

The master rates were updated (escalated) by multiplying the master rate of the previous year with the new (average) CPI value. The latest average CPI was published end of December 2024.

Table 2: Consumer price indices headline year-on-year rates

Year	Jan	Feb	March	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Average
2023	6.9	7	7.1	6.8	6.3	5.4	4.7	4.8	5.4	5.9	5.5	5.1	5.91
2024	5,3	5,6	5,3	5,2	5,2	5,1	4,6	4,4	3,8	2,8	2,9	3,0	4,43



3.9 Closure methods and assumptions

The DMR Guideline presents generally accepted closure methods, based on experience in the field, which have been used as the basis for determining the Master Rates for the various closure components in the “rules-based” approach. Where relevant, specific reference is made to the site conditions and requirements applicable to the closure of the Savuka 7a and 7b TSFs. In addition, the relevant mine structures and components requiring closure are listed.

3.9.1 Component 8B: Process plant waste: basic, salt-producing

Basic, salt-producing residue deposits are typical of the following mining activities:

- Base metals (copper, cadmium, cobalt, iron-ore, molybdenum, nickel and tin),
- Chrome,
- Diamonds and precious stones,
- Gold, silver and uranium,
- Phosphate,
- Platinum,
- Mineral sands (ilmenite, titanium, rutile and zircon), and
- Industrial sands (andalusite, barite, bauxite, cryolite and fluorspar)

The Master Rate for basic, salt-producing process plant waste includes shaping and grassing/vegetation of the dumps as well as establishing an armoured cover on the reshaped surface of the dump.

3.9.2 Component 14: Maintenance and aftercare

Maintenance and aftercare is planned for 2 to 3 years after mine production ceases, and covers:

- Annually fertilising of rehabilitated areas,
- Monitoring of surface and subsurface water quality surface,
- Control of wattle and all other alien plants, and
- General maintenance, including rehabilitation of cracks and subsidence.



3.9.3 Costs

The quantum for financial provisions for unscheduled closure was estimated using the rule-based approach defined in the DMR Guideline. Refer to Table 3 for a summarised breakdown of the unscheduled closure cost assessment estimate as of December 2024.

Table 3: Summary of the unscheduled closure cost for Savuka 7a and 7b TSFs

CALCULATION OF THE QUANTUM							
MINE: HARMONY GOLD MINING COMPANY LIMITED EVALUATORS: MINELOCK ENVIRONMENTAL ENGINEERS (PTY) LTD				LOCATION: Carletonville DATE: 2025/01/17			
NO	DESCRIPTION	UNIT	A QUANTITY	B MASTER RATE DEC 2024	C MULTIPLICATIO N FACTOR	D WEIGHTING FACTOR	AMOUNT RAND DEC 2024
1	Dismantling of processing plant and related structures (Including overland conveyors and power lines)	m ³	-	R 19,29	1,00	1,00	R 0,00
2(A)	Demolition of steel buildings and structures	m ²	-	R 268,72	1,00	1,00	R 0,00
2(B)	Demolition of reinforced concrete buildings and structures	m ²	-	R 396,01	1,00	1,00	R 0,00
3	Rehabilitation of access roads Including all haul roads	m ²	-	R 48,09	1,00	1,00	R 0,00
4(A)	Demolition and rehabilitation of electrified railway lines	m	-	R 466,73	1,00	1,00	R 0,00
4(B)	Demolition and rehabilitation of non-electrified railway lines	m ²	-	R 254,58	1,00	1,00	R 0,00
5	Demolition of housing and/or administration facilities	m ²	-	R 537,45	1,00	1,00	R 0,00
6	Opencast rehabilitation including final voids and ramps	ha	-	R 273 528,48	0,52	1,00	R 0,00
7	Sealing of shafts, adits and inclines	m ³	-	R 144,26	1,00	1,00	R 0,00
8(A)	Rehabilitation of overburden and spoils	ha	-	R 187 821,00	1,00	1,00	R 0,00



CALCULATION OF THE QUANTUM							
MINE: HARMONY GOLD MINING COMPANY LIMITED EVAULUATORS: MINELOCK ENVIRONMENTAL ENGINEERS (PTY) LTD				LOCATION: Carletonville DATE: 2025/01/17			
NO	DESCRIPTION	UNIT	A QUANTITY	B MASTER RATE DEC 2024	C MULTIPLICATIO N FACTOR	D WEIGHTING FACTOR	AMOUNT RAND DEC 2024
8(B)	Rehabilitation of processing waste deposits and evaporation ponds (basic, salt-producing waste)	ha	2,19	R 233 927,66	1,00	1,00	R 512 264,15
8(C)	Rehabilitation of processing waste deposits and evaporation ponds (acidic, metal-rich waste)	ha	-	R 679 436,83	0,80	1,00	R 0,00
9	Rehabilitation of subsided areas	ha	-	R 157 271,81	1,00	1,00	R 0,00
10	General surface rehabilitation	ha	-	R 148 785,91	1,00	1,00	R 0,00
11	River diversions	ha	-	R 148 785,91	1,00	1,00	R 0,00
12	Fencing	m	-	R 169,72	1,00	1,00	R 0,00
13	Water management	ha	-	R 56 572,59	0,67	1,00	R 0,00
14	Maintenance and aftercare	ha	2,19	R 19 800,41	1,00	1,00	R 43 359,73
15(A)	Specialist study	Sum	-	R 0,00	1,00	1,00	R 0,00
15(B)	Specialist study	Sum	-	R 0,00	1,00	1,00	R 0,00
Sub Total 1							R 555 623,88
Weighting factor 2 (1)							R 555 623,88
1	Preliminary and general	12% of Sub Total 1					R66 674,87
Sub Total 2							R 622 298,75
2	Contingencies	10 % of Sub Total 1					R55 562,39
Grand Total 3 (Excluding VAT)							R677 861,13



4. CONCLUSION

The financial provision for rehabilitation and closure for Savuka 7a and 7b TSFs at Harmony is documented in this Report. All information was provided by EIMS and Harmony. No site visits were conducted and, in those cases, where information was not available, estimates / assumptions were made based on experience.

The Master Rates was escalated with an average CPI published until end of December 2024.

Notwithstanding the above, the closure quantum documented in this Report reflects the costs for closure costs provision in December 2024 aligned with the Harmony current approved EMPR.

5. RECOMMENDATIONS

Aspects that require further attention have been identified. These aspects may improve the accuracy of future closure cost estimates.

- To ensure that the financial provision is up-to-date and in accordance with the NEMA requirements, annual revision of closure costing is recommended. This will also assist in accommodating changes in the closure cost due to any facilities that were constructed or demolished as well as any changes in the closure approach.

6. REFERENCES

Department of Mineral Resources. (2005). *Guideline Document for The Evaluatuon of The Quantum of Closure-Related Financial Provision Provided by a Mine*.

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