APPENDIX H: FINANCIAL PROVISION

REHABILITATION, DECOMMISSIONING AND MINE CLOSURE PLAN FOR THE PROPOSED EXPANSIONS AT MOKALA MANGANESE MINE

FY2021

[GNR 1147 – APPENDIX 4]

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DOCUMENT CONTROL

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AUTHOR/S:	Closure Plan: Jeanette Erasmus – Environmental Manager Closure Cost Estimation: Leon Koekemoer – Estimator
REVIEWER/S:	Jeanette Erasmus – Environmental Manager

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2	Draft Report	Mavisha Nariansamy	SLR Sr. Environmental Consultant	30 September 2021
3	Final Report	Mavisha Nariansamy	SLR Sr. Environmental Consultant	21 January 2022
F	Final Report	Mavisha Nariansamy	SLR Sr. Environmental Consultant	9 February 2022

DETAILS OF PRACTITIONERS

NAME	EXPERIENCE / PROFESSIONAL REGISTRATION
Jeanette Erasmus *Director & Environmental Manager*	Jeanette obtained her B.Sc. Honours degree in Geography and Environmental studies in 2005, during that time, she worked as a Research Assistant at the Research Focus Area for Environmental Science and Management at the North-West University. She obtained her M.Sc. degree in Environmental Management, Cum Laude, in 2006 while working as an Environmental Consultant. Since then, she is working as an Environmental Manager. Jeanette is a member of the Land Rehabilitation Society of Southern Africa (LaRSSA) and is registered as a Professional Natural Scientist with the South African Council for Natural Scientific Professions (SACNASP). Her key experience includes the compilation of closure plans, risk assessments and gap analyses for closure planning as well as the project management of projects for mine closure planning, rehabilitation and remediation of disturbed areas. She also assists clients with facilitation of onsite workshops and training in understanding the mine closure planning process and management of associated liabilities.
Leon Koekemoer *Director & Estimator*	Leon has a National Diploma in Building (N. Dip. Building) and is an Associate Member of the Association of South African Quantity Surveyors (ASAQS), registration no. 29649790 and a member of the Land Rehabilitation Society of Southern Africa (LaRSSA). He was a Senior Project Manager for Beckers Building Contractors from 2005 – 2011, where his key roles included project management, cost control and quality control. Leon specialises in the development of closure liabilities and models as well as assisting and advising in the closure planning process for mining and industrial sites. His key experience includes the calculation of environmental liabilities and the representation thereof in closure models. His expertise allows him to address all categories associated with liabilities such as closure liability cash flows, rehabilitation cash flows, auditing of liabilities and operational closure costing.
Pieter Vlok *Civil Engineering Technologist*	Pieter is a qualified engineer (BTech – Engineering Civil) and obtained his B-Tech degree in 2012 and B.Sc. Honours (Water Resources) in 2015. Pieter is registered with ECSA, registration no 201670282 and is a member of SAICE. He has been involved in the field of construction,

NAME	EXPERIENCE / PROFESSIONAL REGISTRATION
	project management and design of various projects within the construction industry since 2012. He joined E-TEK Consulting in 2016 as a Civil Technologist where his current focus is mainly on compiling stormwater management plans, the onsite implementation and supervision of these projects as well as client liaison. Pieter is also involved with Rehabilitation projects, designs and modelling, where his key responsibilities is to optimize the dumping profile and estimate the rehabilitation cost required by legislation.
Joani Taljaard *Quantity Surveyor*	Joani Taljaard graduated with a B. Sc Quantity Surveying (Hons) (Cum Laude) in 2015 from the University of Pretoria. She was a student Quantity Surveyor at Matla Quantity Surveyors (Pretoria) from 2014 to 2015, a junior Quantity Surveyor at Tronkon Construction (Potchefstroom) from 2016 to 2018 and a Candidate Quantity Surveyor at QS Africa Construction Consultants (Klerksdorp) from 2018 to 2021 where she managed the Potchefstroom office. She worked on a wide range of projects, including commercial developments, residential dwellings, health facilities, educational facilities, and insurance claims. She obtained experience from a construction and professional perspective in the six stages of a construction process: inception, concept and viability, design development, documentation and procurement, construction, and close out. She was employed by E-TEK Consulting in 2021 where she focusses on the calculation of closure liability estimates for scheduled and unscheduled closures as well as the annual updating of the liability estimates.

NEMA (ACT NO. 107 OF 1998): FINANCIAL PROVISIONING REGULATIONS, 2015 (NO. R. 1147)

&

REFERENCE IN THIS DOCUMENT

THE REGULATIONS APPENDIX 4	DESCRIPTION OF MINIMUM REQUIRED CONTENT	SECTION IN THIS DOCUMENT
(a)(i) (a)(ii)	Detail of Practitioner/s which compiled the Plan, including professional registrations, qualifications and experience	**Pages ii - iv**
(b)	The context of the project	**0 and 2**
(b)(i)	Material information and issues that have guided the development of the plan	
(b)(ii)	An overview of: (aa) environmental and (bb) social context That may influence, or be influenced by, the closure activities and post-mining land use	**4**
(b)(iii)	Stakeholder issues and comments that have informed the plan	**9**
(b)(iv)	The mine plan and schedule for the full approved operations, which includes: (aa) appropriate description of the mine plan; (bb) drawings and figures to indicate how the mine develops; (cc) what areas are disturbed; and (dd) how infrastructure and structures develop during operations	**2**
(c)	Findings of an environmental risk assessment leading to the most appropriate closure strategy, including:	**8**
(c)(i)	A description of the risk assessment methodology including risk identification and quantification (all areas)	

THE REGULATIONS APPENDIX 4	DESCRIPTION OF MINIMUM REQUIRED CONTENT	SECTION IN THIS DOCUMENT
(c)(ii)	An identification of indicators that are most sensitive to potential risks and the monitoring of such risks (to inform rehabilitation and remediation activities)	
(c)(iii)	An identification of conceptual closure strategies to avoid, manage and mitigate the impacts and risk	
(c)(iv)	Reassessment of the risks to determine whether, after the implementation of the closure strategy, the latent or residual risk has been avoided and / or how it has resulted in avoidance, rehabilitation and management of impacts and whether this is acceptable to the mining operation and stakeholders;	
(c)(v)	An explanation of changes to the risk assessment results, as applicable in annual updates to the plan	
(d)	Design principles	**7**
(d)(i)	The legal and governance framework and interpretation of these requirements for the closure design principles;	**3**
(d)(ii)	Closure vision, objectives and targets, which must reflect the local environmental and socio-economic context and reflect regulatory and corporate requirements and stakeholder expectations;	**5**
(d)(iii)	Description and evaluation of alternative closure and post closure options (where these exist, that are practicable within which the operation is located)	**7**
(d)(iv)	A motivation for the preferred closure action within the context of the risks and impacts that are being mitigated;	
(d)(v)	A definition and motivation of the closure and post closure period, taking cognisance of the probable need to implement post closure monitoring and maintenance for a period sufficient	

THE REGULATIONS APPENDIX 4	DESCRIPTION OF MINIMUM REQUIRED CONTENT	SECTION IN THIS DOCUMENT
	to demonstrate that relinquishment criteria have been achieved;	
(d)(vi)	Details associated with any on-going research on closure options;	
(d)(vii)	A detailed description of the assumptions made to develop closure actions (in absence of detailed knowledge on site conditions, potential impacts, material availability, stakeholder requirements and other factors for which information is lacking)	
(e)	A proposed final post-mining land use which is appropriate, feasible and possible of implementation, including:	**6**
(e)(i)	Descriptions of appropriate and feasible final post-mining land use for the overall project and per infrastructure or activity and a description of the methodology used to identify final post-mining land use, including the requirements of the operations stakeholders;	
(e)(ii)	A map of the proposed final post-mining land use;	
(f)	Closure actions, including:	**7**
(f)(i)	The development and documenting of a description of specific technical solutions related to infrastructure and facilities for the preferred closure option or options, which must include all areas, infrastructure, activities and aspects both within the mine lease area and off of the mine lease area associated with mining for which the mine has the responsibility to implement closure actions;	
(f)(ii)	The development and maintenance of a list and assessment of threats and opportunities and any uncertainties associated with the preferred closure option, which list will be used to identify and define any additional work that is needed to reduce the level of uncertainty;	

THE REGULATIONS APPENDIX 4	DESCRIPTION OF MINIMUM REQUIRED CONTENT	SECTION IN THIS DOCUMENT
(g)	A schedule of actions for final rehabilitation, decommissioning and closure	**10**
(g)(i)	Scheduled to be linked to the mine works programme, if greenfields, or to the current mine plan, if brownfields;	
(g)(ii)	Schedule to include assumptions and schedule drivers;	
(g)(iii)	Including a spatial map or schedule, showing planned spatial progression throughout operations;	
(h)	An indication of the organisational capacity that will be put in place to implement the plan, including:	
(h)(i)	Organisational structure as it pertains to the plan;	
(h)(ii)	Responsibilities;	
(h)(iii)	Training and capacity building that may be required to build closure competence;	
(i)	An indication of gaps in the plan, including an auditable action plan and schedule to address the gaps;	**7**
(j)	Relinquishment criteria for each activity or infrastructure in relation to environmental aspects with auditable indicators;	
(k)	Closure cost estimation procedure, which ensures that identified rehabilitation, decommissioning, closure and post-closure costs, whether ongoing or once-off, are realistically estimated and incorporated into the estimates, on condition that:	**11**
(k)(i)	Cost estimates for operations, or components of operations that are more than 30 years from closure will be prepared as conceptual estimates with an accuracy of ± 50 per cent. Cost estimates will have an accuracy of ± 70 per cent for operations, or components of operations, 30 or less years (but more than	

THE REGULATIONS APPENDIX 4	DESCRIPTION OF MINIMUM REQUIRED CONTENT	SECTION IN THIS DOCUMENT
	ten years) from closure and ± 80 per cent for operations, or components of operations ten or less years (but more than five years) from closure. Operations with 5 or less years will have an accuracy of ± 90 per cent. Motivation must be provided to indicate the accuracy in the reported number and as accuracy improves, what actions resulted in an improvement in accuracy;	
(k)(ii)	The closure cost estimation must include: (aa) an explanation of the closure cost methodology; (bb) auditable calculations of costs per activity or infrastructure; (cc) cost assumptions;	
(k)(iii)	The closure cost estimate must be updated annually during the operation's life to reflect known developments, including changes from the annual review of the closure strategy assumptions and inputs, scope changes, the effect of a further year's inflation, new regulatory requirements and any other material developments;	
(l)	Monitoring, auditing and reporting requirements (which relates to the risk assessment, legal requirements and knowledge gaps as a minimum) and must include:	**12**
(l)(i)	A schedule outlining internal, external, and legislated audits of the plan for the year, including: (aa) the person responsible for undertaking the audit(s); (bb) the planned date of audit and frequency of audit; (cc) an explanation of the approach that will be taken to address and close out audit results and schedule;	
(l)(ii)	A schedule of reporting requirements providing an outline of internal and external reporting, including disclosure of updates of the plan to stakeholders;	

THE REGULATIONS APPENDIX 4	DESCRIPTION OF MINIMUM REQUIRED CONTENT	SECTION IN THIS DOCUMENT
(I)(iii)	A monitoring plan which outlines: (aa) parameters to be monitored, frequency of monitoring and period of monitoring; (bb) an explanation of the approach that will be taken to analyse monitoring results and how these results will be used to inform adaptive or corrective management and/or risk reduction activities;	
(m)(i)	Motivations for any amendments made to the final rehabilitation, decommissioning and mine closure plan, given the monitoring results in the previous auditing period and the identification of gaps as per 2(i).	**12**

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TERMS AND ABBREVIATIONS

TERMS & ABBREVIATIONS	DESCRIPTION
BoQ	Bill of Quantities
Closure	This involves the application for closure certificate and initiation of transfer of on-going care and maintenance to third parties
DEA	Department of Environmental Affairs
DMR	Department of Mineral Resources
DWS	Department of Water and Sanitation
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
EMP	Environmental Management Plan
E-TEK	E-TEK Consulting (Pty) Ltd
GDP	Gross Domestic Product
GG	Government Gazette
ICMM	International Council on Mining and Metals
I&APs	Interested and Affected Parties
KPIs	Key Performance Indicators
LoM	Life of Mine or Scheduled closure that happens at the planned date and/or time horizon
Post-closure	The period after mine closure
Premature or Un-scheduled Closure	Immediate closure of a site, representing decommissioning and reclamation of the site in its present state
Rehabilitation	The return of a disturbed area to its original state, or as close as possible to this state
ROM	Run of Mine
SEP	Stakeholder Engagement Plan
SLP	Social and Labor Plan

TERMS & ABBREVIATIONS	DESCRIPTION
SOE	State of Environment
SWMP	Stormwater Management Plan
The Regulations	The Financial Provisioning Regulations, 2015, published under Government Notice No. R. 1147 of 20 November 2015
WHO	World Health Organization
WRD	Waste Rock Dump
WUL	Water Use License
ZOI	Zones of Influence

EXECUTIVE SUMMARY

Project Description

E-TEK Consulting (Pty) Ltd (E-TEK) was appointed by SLR Consulting (Pty) Ltd (SLR) to assist Mokala Manganese Pty (Ltd) (Mokala) with the necessary documentation to guide their closure planning process for the proposed expansions and integrate it as part of the future operational and rehabilitation activities at the Mokala Manganese Mine.

Mokala is an opencast manganese mine on the remaining extent of the farm Gloria 266, located approximately 4 km north-west of the town Hotazel in the Joe Morolong Local Municipality in the Northern Cape province.

This document is referred to as the Final Decommissioning, Rehabilitation and Mine Closure Plan for the proposed expansions at Mokala Manganese Mine. This is Appendix 4, as stated in the Financial Provisioning Regulations, 2015 published under Government Notice No. R 1147 of 20 November 2015 (referred to hereafter as GNR 1147) as well as Section 24 of the National Environmental Management Act 107 of 1998.

Purpose and Approach

This document supports the following activities as part of the Environmental Impact Assessment (EIA) and is not to be considered as a site-wide document:

- Proposed opencast expansion (including mining of Kalagadi barrier pillar, on Kalagadi Mine property south of Mokala Mine);
- Proposed Waste Rock Dump expansion;
- Proposed New Waste Rock Dump;
- Proposed Topsoil Stockpile;
- Extended area for the Run of Mine (RoM) and Product footprint area;
- Top-up stockpile areas at the weighbridge (for ROM and product);
- Construction of a water pipeline, to be connected to the Sedibeng water pipeline on Gloria Farm 266, Portion 1 (on Assmang Manganese Mine's property)

The main purpose is to provide Mokala with a document that can act as a guideline document during operational and rehabilitation activities and thereby assist them in its closure planning process and managing of the liability estimate.

The development of this plan is mainly guided by:

- Section 3: Statutory and Corporate related requirements to ensure legal compliance;
- Section 4: The State and context of the surrounding Bio-Physical - and Social Environment in which the operations are located;
- Section 5: Closure objectives and targets;
- Section 6: Post-Mining Land use/s;
- Section 7: Design principles, Closure activities and Technical solutions (Rehabilitation and Closure criteria)
- Section 8: Closure Risk assessment (following a risk-based approach);

The approach included a comprehensive literature review of all the applicable Mokala rehabilitation and closure documentation, onsite investigations, as well as discussions, meetings and workshops with Mokala personnel.

Closure Objectives and Post-Mining Land Use

Closure objectives and targets are being considered as part of the ongoing Mine Closure planning process and reflects the underlying principles for the Closure vision.

These principles deal with the local environmental context, socio-economic context, regulatory and corporate requirements as well as stakeholder expectations.

In order to identify a post-mining land use, the following were considered:

- A proposed final post-mining land use which is appropriate, feasible and possible of implementation; and
- Descriptions of appropriate and feasible final post-mining land use for the overall project and per infrastructure or activity and a description of the methodology used to identify final post-mining land use, including the requirements of the operations stakeholders.

As per the current Environmental Management Plans (EMPs), there are a number of land uses which may be influenced by the proposed project and associated potential environmental impacts. It should however be noted that areas within and surrounding the proposed project site have already been significantly influenced through mining and related infrastructure, road networks, powerlines, Telkom lines, railway networks and grazing activities.

The post-mining land use should fit into the surrounding land uses, in order to ensure long-term sustainability of the rehabilitated mining areas. When taking the State of Environment into consideration and the feasibility of the implementation of the proposed land use at Mokala, the proposed project site is primarily classified as grazing. Refer to Section 6.

Rehabilitation and Closure Criteria & Risk Assessment

All potential risks, associated with the closure of the Mokala Manganese Mine operations, were identified during desktop studies of the site, as well as discussions with operational personnel. Rehabilitation and Closure criteria or mitigation measures were established for each of these risks.

The risks were individually evaluated in terms of a risk matrix and ranked for the closure scenarios before and after implementation of the Rehabilitation and Closure criteria or mitigation measures. Refer to Section 7 for the Rehabilitation and Closure criteria sheet and Section 8 and Appendix B for the detailed Closure Risk Assessment.

All risks identified during the Risk Assessment Process can be mitigated with no associated residual activities or risks, therefore no risks were identified as having a significant or high-risk post-mitigation.

Current and Post-closure Monitoring

There are current Monitoring programmes in place at Mokala Manganese Mine which were approved as part of previous EMPs, and the closure liability / costs are not included for this document again. Only Care and Maintenance is included for this liability.

Closure Cost Estimation

The financial provision has been updated and re-evaluated to support the minimum requirements of GNR 1147. This report provides the financial provision required for a closure scenario based on FY2021.

The following table presents a list of all the proposed closure components, and which represents a liability:

Table 1: List of Closure Components

CLOSURE COMPONENTS		APPLICABLE
1	INFRASTRUCTURAL ASPECTS	
1.1	Plant and Related Structures	No
1.2	Shafts, Adits and Declines	No
1.3	Supporting Infrastructure	No
1.4	Underground Infrastructure	No
1.5	Social Infrastructure	No
1.6	Off-Site Infrastructure	No
1.7	Linear Items	No
1.8	Waste Disposal	No
1.9	River Diversion	No

CLOSURE COMPONENTS		APPLICABLE
2	MINING ASPECTS	
2.1	Opencast / Pit Areas	Yes
2.2	Waste Rock Dumps - Overburden and Spoils	Yes
2.3	Coarse Residue Deposits - Processing Waste	No
2.4	Fine Residue Deposits - Processing Waste	No
3	BIO-PHYSICAL CLOSURE ASPECTS	
3.1	Water Resources	No
3.2	Climate Change	No
3.3	Sensitive Habitats and Biodiversity	No
3.4	Land Use and Land Capability	No
3.5	Soil	No
3.6	Other; Air Quality and Topography	No
4	SOCIAL CLOSURE ASPECTS	
4.1	Employees	No
4.2	Interested and Affected Parties	No
4.3	Government	No
5	GENERAL ASPECTS	
5.1	General Surfaces	No
5.2	Post-Closure Monitoring and Maintenance	Yes
5.3	Specialist Studies	No

The following should be noted:

The mine is currently operational, Mokala is in the process to obtain environmental authorization for the following facilities:

- Proposed opencast expansion (including mining of Kalagadi barrier pillar, on Kalagadi Mine property south of Mokala Mine);
- Proposed Waste Rock Dump expansion;
- Proposed New Waste Rock Dump;
- Proposed Topsoil Stockpile;
- Extended area for the Run of Mine (RoM) and Product footprint area;
- Top-up stockpile areas at the weighbridge (for ROM and product);
- Construction of a water pipeline, to be connected to the Sedibeng water pipeline on Gloria Farm 266, Portion 1 (on Assmang Manganese Mine's property)

A dedicated site visit and workshop with Mokala management was conducted to understand the current on-site conditions and the relevant closure criteria for the proposed activities.

All relevant information supporting the financial provision was sourced from Mokala and rates were obtained from E-TEK's existing database. In consultation with demolition and earthworks contractors these rates represent market conditions for Y2021.

The costing model that has been utilized to calculate the financial provision is aligned to the **closure components** as set out in Table 1.

The financial provision for Mokala proposed activities were calculated based on the requirements of Appendix 4 of GNR 1147. The requirements of GNR 1147 indicates that the financial provision should be for the greatest number out of the 10 Year forecast. Table 2 indicates the calculated 1–10-year closure forecast is based on the following timelines:

- Year 1 – Premature Closure (FY2021); and
- Year 2 – 10 Closure Forecast (FY2022 – FY2030).

Based on the calculations it was determined that Mokala will be required to financially provide for **FY2029 out of the closure forecast.** The closure forecast considers the following factors:

- Current proposed mine plan; and
- Dumping and or deposition strategies.

The total **financial provision required** for the Mokala proposed activities (including P&G's, Contingencies and VAT) has been estimated to be **R145 872 076,65** (Refer to Appendix D for the detail cost breakdown per component and closure forecast).

Table 2: Financial Provision Summary

MOKALA MANGANESE MINE EIA - FINANCIAL PROVISION SUMMARY												
ESTIMATED CLOSURE COST ESTIMATES (INCLUDES P&G'S, CONTINGENCIES AND VAT AND EXCLUDES ESCALATION)			Premature Closure	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast
CLOSURE COMPONENTS			2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
1	**INFRASTRUCTURAL ASPECTS**		**R 100 000,00**	**R 100 000,00**	**R 100 000,00**	**R 100 000,00**	**R 100 000,00**	**R 100 000,00**	**R 100 000,00**	**R 100 000,00**	**R 100 000,00**	**R 100 000,00**
1,1	PLANT AND RELATED STRUCTURES		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
1,2	SHAFTS, ADITS AND DECLINES		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
1,3	SUPPORTING INFRASTRUCTURE		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
1,4	UNDERGROUND INFRASTRUCTURE		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
1,5	SOCIAL INFRASTRUCTURE		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
1,6	OFF-SITE INFRASTRUCTURE		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
1,7	LINEAR ITEMS		R 100 000,00	R 100 000,00	R 100 000,00	R 100 000,00	R 100 000,00	R 100 000,00	R 100 000,00	R 100 000,00	R 100 000,00	R 100 000,00
1,8	WASTE DISPOSAL		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
1,9	RIVER DIVERSION		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
2	**MINING ASPECTS**		**-R 4 276 594,86**	**R 78 349 695,28**	**R 82 308 766,10**	**R 97 251 138,82**	**R 101 235 166,53**	**R 103 522 125,49**	**R 102 296 968,90**	**R 103 429 104,34**	**R 104 874 335,35**	**R 103 084 245,45**
2,1	OPENCAST / PIT AREAS		-R 7 584 407,03	R 75 041 883,12	R 79 000 953,93	R 93 943 326,65	R 97 927 354,36	R 100 214 313,32	R 98 989 156,73	R 100 121 292,17	R 101 566 523,18	R 99 776 433,28
2,2	WASTE ROCK DUMPS - OVERBURDEN AND SPOILS		R 3 307 812,17	R 3 307 812,17	R 3 307 812,17	R 3 307 812,17	R 3 307 812,17	R 3 307 812,17	R 3 307 812,17	R 3 307 812,17	R 3 307 812,17	R 3 307 812,17
2,3	COARSE RESIDUE DEPOSITS - PROCESSING WASTE		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
2,4	FINE RESIDUE DEPOSITS - PROCESSING WASTE		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
3	**BIO-PHYSICAL CLOSURE ASPECTS**		**R -**	**R -**	**R -**	**R -**	**R -**	**R -**	**R -**	**R -**	**R -**	**R -**
3,1	WATER RESOURCES		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
3,2	SENSITIVE HABITATS & BIODIVERSITY		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
3,3	LAND USE & LAND CAPABILITY		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
3,4	SOIL		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
3,5	OTHER: AIR QUALITY & TOPOGRAPHY		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
4	**SOCIAL CLOSURE ASPECTS**		**R -**	**R -**	**R -**	**R -**	**R -**	**R -**	**R -**	**R -**	**R -**	**R -**
4,1	EMPLOYEES		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
4,2	INTERESTED AND AFFECTED PARTIES		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
4,3	GOVERNMENT		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
5	**GENERAL ASPECTS**		**R 3 441 529,25**	**R 3 431 847,96**	**R 3 572 630,03**	**R 4 103 971,38**	**R 4 245 640,90**	**R 4 326 963,72**	**R 4 283 397,92**	**R 4 323 655,94**	**R 4 375 047,45**	**R 4 311 392,98**
5,1	GENERAL SURFACES		R 2 543 535,65	R 2 543 535,65	R 2 543 535,65	R 2 543 535,65	R 2 543 535,65	R 2 543 535,65	R 2 543 535,65	R 2 543 535,65	R 2 543 535,65	R 2 543 535,65
5,2	POST CLOSURE MONITORING AND MAINTENANCE		R 897 993,60	R 888 312,31	R 1 029 094,37	R 1 560 435,73	R 1 702 105,25	R 1 783 428,06	R 1 739 862,27	R 1 780 120,29	R 1 831 511,80	R 1 767 857,33
5,3	SPECIALIST STUDIES		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
	SUB-TOTAL 1		**-R 735 065,61**	**R 81 881 543,25**	**R 85 981 396,13**	**R 101 455 110,20**	**R 105 580 807,43**	**R 107 949 089,20**	**R 106 680 366,82**	**R 107 852 760,28**	**R 109 349 382,79**	**R 107 495 638,43**
	Weighted Preliminary and General	6%	-R 44 103,94	R 4 912 892,59	R 5 158 883,77	R 6 087 306,61	R 6 334 848,45	R 6 476 945,35	R 6 400 822,01	R 6 471 165,62	R 6 560 962,97	R 6 449 738,31
	Weighted Contingencies	10%	-R 73 506,56	R 8 188 154,32	R 8 598 139,61	R 10 145 511,02	R 10 558 080,74	R 10 794 908,92	R 10 668 036,68	R 10 785 276,03	R 10 934 938,28	R 10 749 563,84
	SUB-TOTAL 2 FOR P&G's AND CONTINGENCIES		**-R 117 610,50**	**R 13 101 046,92**	**R 13 757 023,38**	**R 16 232 817,63**	**R 16 892 929,19**	**R 17 271 854,27**	**R 17 068 858,69**	**R 17 256 441,65**	**R 17 495 901,25**	**R 17 199 302,15**
	SUB-TOTAL 3		**-R 852 676,10**	**R 94 982 590,17**	**R 99 738 419,51**	**R 117 687 927,83**	**R 122 473 736,61**	**R 125 220 943,48**	**R 123 749 225,51**	**R 125 109 201,93**	**R 126 845 284,04**	**R 124 694 940,58**
	VAT	15%	-R 127 901,42	R 14 247 388,53	R 14 960 762,93	R 17 653 189,18	R 18 371 060,49	R 18 783 141,52	R 18 562 383,83	R 18 766 380,29	R 19 026 792,61	R 18 704 241,09
	GRAND-TOTAL		**-R 980 577,52**	**R 109 229 978,69**	**R 114 699 182,43**	**R 135 341 117,01**	**R 140 844 797,11**	**R 144 004 085,00**	**R 142 311 609,34**	**R 143 875 582,22**	**R 145 872 076,65**	**R 143 399 181,66**

Rehabilitation and Closure Plan Overview

It is important to understand that this document is the product of a dynamic approach and should therefore be reviewed regularly to ensure that all aspects and associated costs are taken into consideration. Furthermore, it is important that all the information be incorporated into all mining strategies, planning and operational processes. This will ensure that the objectives set out within the document are reached and will also provide potential opportunities to reduce closure costs.

Gaps and Way Forward

For future updates of the closure plan for Mokala Mine as a whole, the following gaps need to be addressed:

- For future updates of the rehabilitation and closure planning documents, Appendix 3 and Appendix 5, should be undertaken as per the GNR 1147 regulation as stated in the Financial Provisioning Regulations, 2015 published under Government Notice No. R 1147 of 20 November 2015. This means that an Annual Rehabilitation plan (Appendix 3) as well as a Latent and Residual Risk assessment (Appendix 5) should be compiled and should take the entire site into consideration.
- This Rehabilitation, Decommissioning and Mine Closure Plan document (which is Appendix 4 as per the GNR 1147 regulation), should also be updated with a site-wide approach.
- Rehabilitation and Closure criteria need to be refined and confirmed for the entire site, through onsite-learnings and implementation of trial sites.
- In terms of monitoring, post-closure monitoring points need to be confirmed and included in the next update of the closure plan for the entire site.
- Timeframes for monitoring and reporting need to be formulated and defined.
- Final site performance criteria need to be clearly formulated and defined to ensure outcomes are measurable.

1. INTRODUCTION

Regulations Reference: (b) & (b)(i)	This Section deals with the context of the project, as well as the material information and issues that have guided the development of the plan.

1.1. PROJECT DESCRIPTION AND CONTEXT

Mokala Manganese (Pty) Ltd (Mokala) is a South African company of which Ntsimbintle Mining (Pty) Ltd owns 51%, with the remaining 49% owned by Blue Flacon 222 Trading (Pty) Ltd.

Mokala is proposing to expand their operations at the opencast manganese mine on the remaining extent and portion 1 of the farm Gloria 266 as well as on the farms Kipling 271 and Umtu 281, located 4 km north-west of the town Hotazel in the Joe Morolong Local Municipality, Northern Cape Province (SLR, 2015).

The proposed expansions and additional areas for the context of this project include the:

- Proposed opencast expansion (including mining of Kalagadi barrier pillar, on Kalagadi Mine property south of Mokala Mine);
- Proposed Waste Rock Dump expansion;
- Proposed New Waste Rock Dump;
- Proposed Topsoil Stockpile;
- Extended area for the Run of Mine (RoM) and Product footprint area;
- Top-up stockpile areas at the weighbridge (for ROM and product);
- Construction of a water pipeline, to be connected to the Sedibeng water pipeline on Gloria Farm 266, Portion 1 (on Assmang Manganese Mine's property).

1.2. APPROACH AND CLOSURE PLANNING

Mokala is committed to implementing standards and statutory requirements pertaining to Mine Closure Planning and the associated Financial Provision. As a way of complying with all the drivers, the need is to review the current Rehabilitation and Closure plans for all operations and update it accordingly.

E-TEK Consulting (Pty) Ltd was requested by SLR Consulting (SLR) to conduct a liability assessment for the new proposed project expansion at the Mokala Manganese Mine. The closure liability assessment needs to comply with the National Environmental Management

Act No 107 of 1998 (GNR 1147), previously governed by the Mineral Petroleum Resources Development Act.

The detail of the approach may be different for diverse operations / mines and are most likely influenced by:

- Legislative and corporate requirements;
- Opportunities and constraints; and
- Needs and expectations of stakeholders.

Documentation was aligned and compiled towards identifying the most appropriate post-mining land use/s and closure-related performance objectives to guide the transition of operations within the expanded mining areas to closure as seamlessly as possible.

It should also ensure compliance to the Legal framework for Mine closure in South-Africa. Refer to the applicable sections in this plan, for the detail information that have guided the development of this plan.

The following are key drivers:

- Section 3: Statutory and Corporate related requirements to ensure legal compliance;
- Section 4: The State and context of the surrounding Bio-Physical - and Social Environment in which the mine is located;
- Section 6: Post-Mining Land uses;
- Section 7: Design principles, Closure activities and Technical solutions;
- Section 8: Closure Risk assessment.

2. MINE SITE CONTEXT

Regulations Reference: (b)(iv)	This Section describes the regional and local setting of the mine, as well as the site description and mine plan for the full approved operations.

2.1. REGIONAL AND LOCAL SETTING

The Mokala Manganese Mine is located on the farm Gloria 226 approximately 4 km north-west of the own within the town Hotazel in the Joe Morolong Local Municipality and the John Taolo Gaetsene District Municipality, Northern Cape Province (see Figure 1 for the regional setting and Figure 2 for the local setting of the mine).

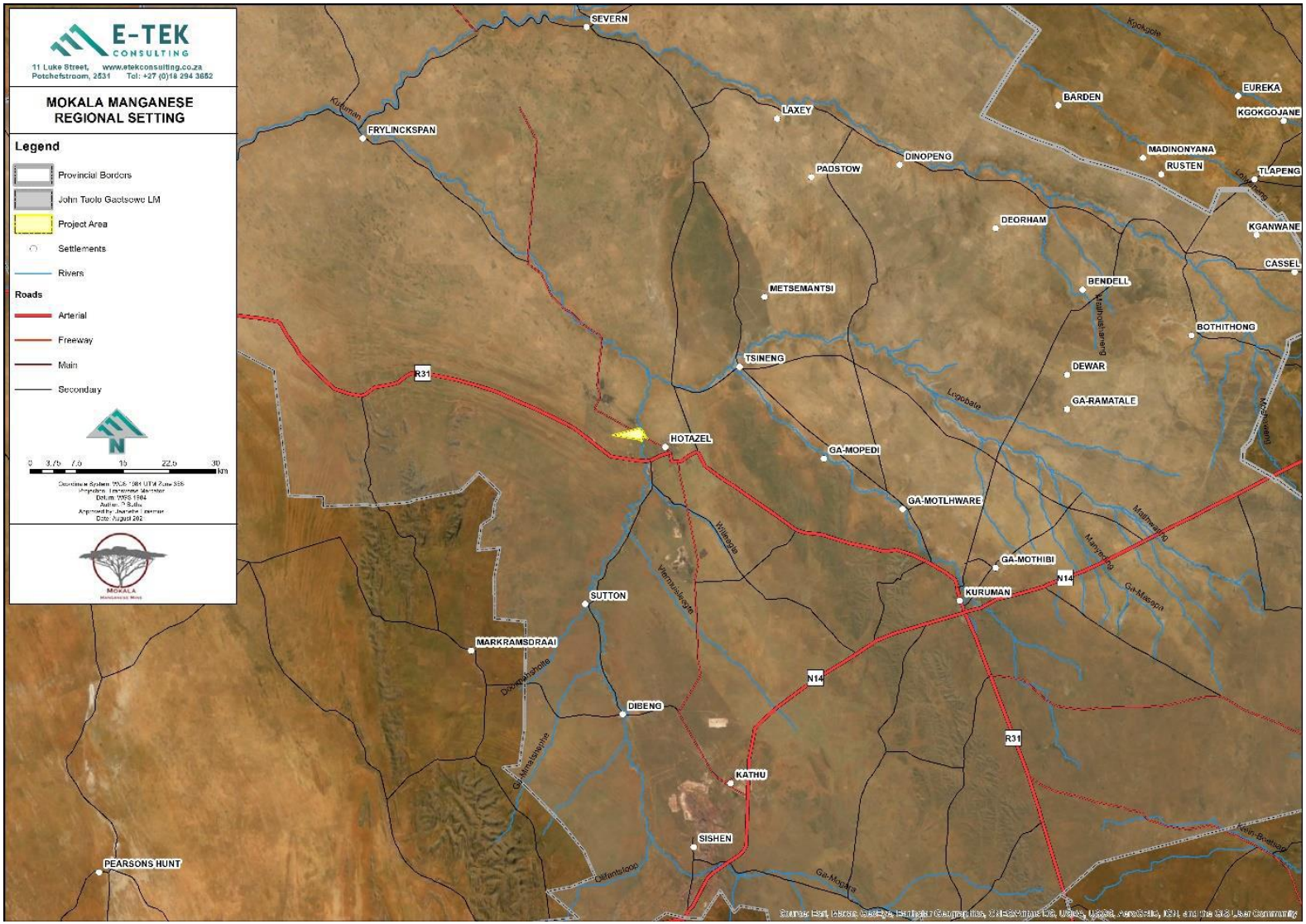

Figure 1: Regional setting of Mokala Manganese Mine

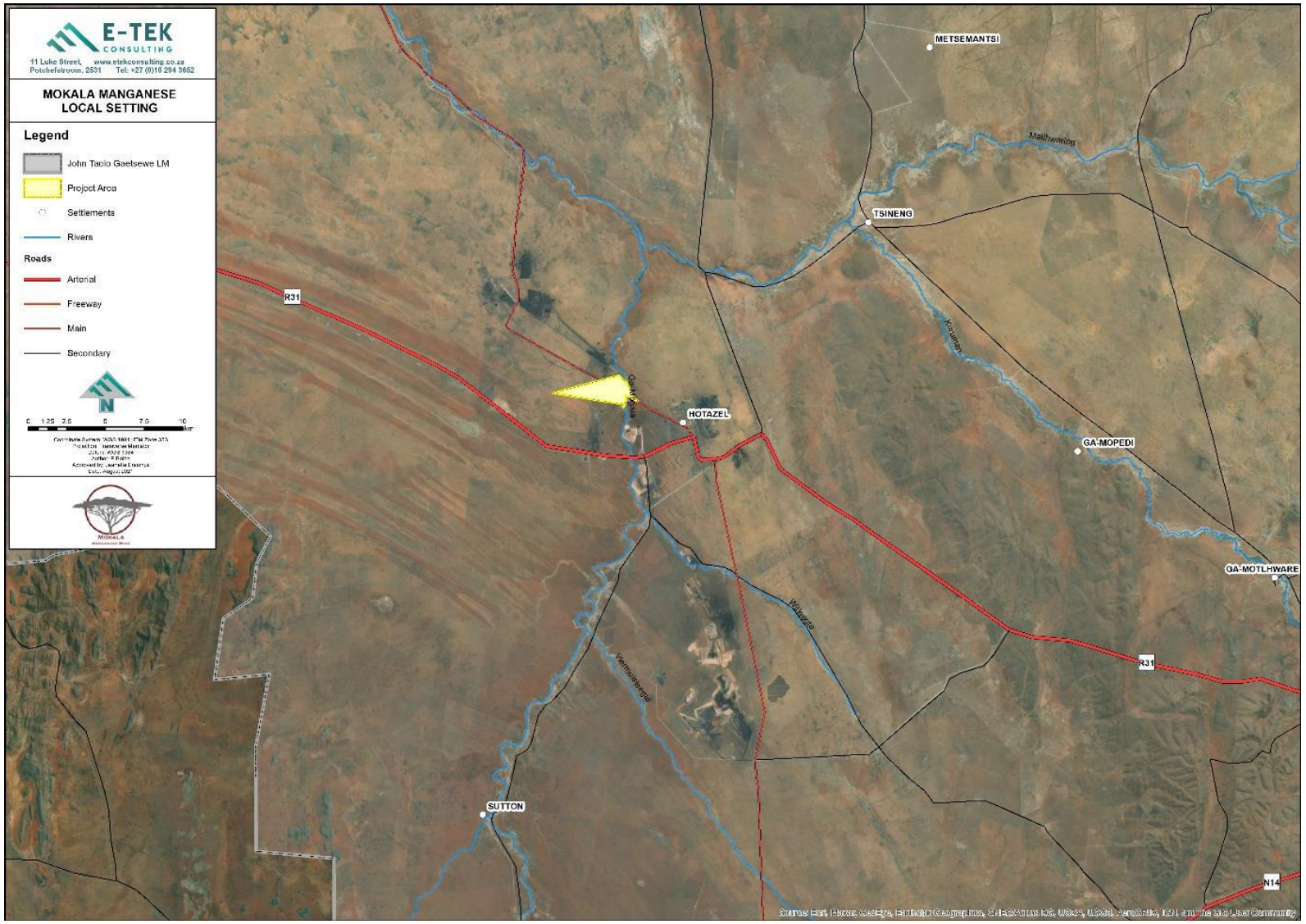

Figure 2: Local setting of Mokala Manganese Mine

2.2. SITE DESCRIPTION AND MINE PLAN

Refer to the Mine Site Layout plan in Appendix A1 for the detail of the site and future planned operations.

As per the approved Mokala Manganese Mine EIA and EMP (SLR, 2015), in broad terms the Mokala Manganese mining project comprises of open cast activities, a dry crushing and screening plant, temporary overburden rock dumps, product and run-of mine stockpiles, topsoil stockpiles, mine related facilities such as workshops, stores and various support infrastructure and services. Further to this, the proposed project includes:

- Expansion of the open pit
- Increase in capacity of the approved WRD and thus an increase in the WRD footprint
- Establishing of an additional WRD (west of the project area)
- Establishment of additional topsoil stockpiles
- Relocation of stormwater management infrastructure
- Increase in capacity of the product stockpiles (ROM stockpiles and product stockpiles)
- Mining of the barrier pillar between the Kalagadi Mine and Mokala Mine

No Bio-physical and Socio-economic closure components are currently relevant to Mine Closure Planning for the expansion at the Mokala Manganese Mine. The State of the Environment (SOE) are however outlined in Section 4.

2.3. DETAIL OF MINE OWNER AND MINING AUTHORISATION HOLDER

Mokala Manganese (Pty) Ltd (Mokala Manganese), is a South African company of which Ntsimbintle Mining (Pty) Ltd owns 51%, with the remaining 49% owned by Blue Flacon 222 Trading (Pty) Ltd. The mining right allows the mining of manganese on the remaining extent and portion 1 of the farm Gloria 266 as well as on the farms Kipling 271 and Umtu 281.

Name and Address of Mokala Manganese: Mokala Manganese (Pty) Ltd

Address: 39 Melrose Boulevard

Melrose Arch

Sandton

2196

Phone:

General Manager Details:

The following are the details for the General Manager at the time of compilation of this closure plan:

Name: Mr Basie van Wyk

Address: Farm Gloria 266 (Remaining Portion)
R380 Road

Phone: T: +27 53 004 0122
C: +27 83 303 7904

3. STATUTORY AND CORPORATE RELATED REQUIREMENTS

Regulations Reference: (b), (b)(i) & (d)(i)	**This Section deals with the context of the project, as well as the material information and issues that have guided the development of the plan.** **It also outlines the Legal and Governance framework and interpretation of the requirements for the closure design principles.**

3.1. MOKALA MANGANESE RELATED CONTEXT

3.1.1. Mine Lease Agreement

Currently Mokala is an established opencast manganese mine on the remaining extent of the farm Gloria 266. The mining right application was submitted by Mokala to the DMRE on 03 July 2015. A single scoping report and EIA and EMP report supporting the new mining right application and associated infrastructure were submitted to the Department of Mineral Resources and Energy (DMRE) for decision making (SLR, 2015). The mining right was granted in 2017 (NC30/5/1/2/2/10090 MR).

Mokala Manganese (Pty) Ltd (Mokala Manganese), is a South African company of which Ntsimbintle Mining (Pty) Ltd owns 51%, with the remaining 49% owned by Blue Flacon 222 Trading (Pty) Ltd. Mokala currently holds a prospecting right (NC30/5/1/1/2/1250PR) over the remaining extent of the farm Gloria 266. Mokala is still undertaking prospecting related activities on the remaining extent of the farm Gloria 266. Assmang (Pty) Ltd currently holds an environmental authorization (NC/EIA/JTG/ASS/HOT/2010 / NCP/EIA/0000030/2011) in terms of NEMA on the remaining extent of the farm Gloria and the farm Kipling 271. Kudumane has submitted an application for environmental authorization (NC/EIAl05/JTG/HOT/KUD/2013 / NCP/EIAl0000219/20I3) in terms of NEMA on the farm Kipling 271 and Hotazel 280. This environmental authorization is still pending (SLR, 2015).

3.1.2. Environmental Management Programme

The Mokala Manganese EMP (SLR, 2015) addresses the legal requirements for EIAs and EMPs on Pages i – v, which also includes the historical requirements relating to the objectives and specific goals for mine closure (as set out in GNR 527). The EMP describes the post-mining land use and aligned with environmental objectives for closure, to restore the land to a

useful land use not dissimilar to the pre mining land use (SLR, 2015). The pre-mining land use within the project areas include mining activities and infrastructure associated with neighbouring mines, road and Telkom line infrastructure, historical mined out areas and ad-hoc game and cattle grazing (Terra Africa Environmental Consultants, 2015). The EMP furthermore sets out potential impacts and mitigation options for closure and post closure but indicates that more detailed plans and options should be contained within the final closure plans, if and when required in future.

3.1.1. Mokala Agreements

Mokala Manganese (Pty) Ltd, has an agreement in place with Assmang Manganese, Black Rock Mine Operations, in terms of their permission to commence preparatory activities in relation to the construction of a water pipeline connection to the Sedibeng Water pipeline on Gloria Farm 266, Portion 1. This agreement was signed on 9 July 2021 (Mokala Pipeline Permission Letter). The agreement only serves as formal correspondence between the parties.

The Land use agreement application between the parties was submitted to the African rainbow Minerals Legal Division to initiate the process for consideration, drafting and approval.

This process is still pending or in progress at the time of compilation of this closure plan documents. A list of terms and conditions were set out and should be agreed to in terms of the outcome of this matter and the authorisation by the regulatory authorities. These terms and conditions also stipulate that the environmental authorisation shall be obtained by Mokala.

No specific agreements were in place with Kalagadi Mine for the mining of the barrier pillar at the stage of compiling this closure plan.

3.2. SOUTH AFRICAN LAWS AND REGULATIONS

Table 3: South African laws and regulations applicable to mine closure

LEGISLATION	OBJECTIVE AND RELEVANCE TO CLOSURE
Acts of parliament: **Constitution of the Republic of South Africa of 1996**	Provides inter *alia* for the right to an environment that is not harmful to human health or wellbeing, and to secure ecologically sustainable development.
Companies Act 71 of 2008	Deals inter alia with registration and liquidation of companies and thus the regulation of mining company rights and liabilities with regards to mine closure

LEGISLATION	OBJECTIVE AND RELEVANCE TO CLOSURE
National Environmental Management Act 107 of 1998	Framework law giving effect to the constitutional environmental right. Provides the framework for regulatory tools in respect of environmental impacts, including mining and mine closure.
Minerals Act 50 of 1991	Repealed by the MPRDA below, however still relevant as holders of old order rights issued in terms of this act are still haled liable for ensuring sustainable mine closure and rehabilitation.
Minerals and Petroleum Resources Development Act 28 of 2002, as amended	Main legislative provision for the granting of mineral rights. Also, the relinquishment of such rights and associated closure liabilities after successful closure and rehabilitation. Introduces the various financial vehicles which may be used to provide for closure and rehabilitation funding.
Mineral and Petroleum Resources Development Act 49 of 2008	Amendment of the above act, which started to align environmental and mining law provisions so as to avoid duplication and to allow for one system of regulation and authorisation.
Income Tax Act 58 of 1962	Regulates the payment of taxes by inter *alia* mining companies. Relevant in respect of the financial provisions required by the MPRDA above so as to ensure that sufficient funds are available to rehabilitate and close mining operations as well as providing for certain tax exemptions in respect of funds related to rehabilitation.
National Water Act 36 of 1998	Regulates the protection of the water resources and the use of water on *inter alia* mining areas. Furthermore, contains provisions relevant to mine closure with regard to water resource protection form pollution and environmental degradation.
Water Services Act 108 of 1997	Deals with the provision of *inter alia* drinking water services and quality to people, and furthermore regulates the situations where mines have undertaken to provide such services. Relevant in terms of mine closure as such

LEGISLATION	OBJECTIVE AND RELEVANCE TO CLOSURE
	services are often required despite closure of a specific site.
Mine Health and Safety Act 29 of 1996	Deals with the health and safety of employees throughout the entire mining life cycle including closure and rehabilitation operations.
Nuclear Energy Act 46 of 1999	Regulates the management and safety of nuclear or radioactive sources including naturally occurring radioactive matter, e.g., certain tailings facilities as well as contaminated mining plant and equipment.
Hazardous Substances Act of 1973 (Group IV Hazardous Substances)	Regulates the management and safety of sealed nuclear sources throughout the entire mining life cycle, including decommissioning and disposal at the time of closure.
National Environmental Management: Waste Act 59 of 2008 as amended by the	Regulates *inter alia* the generation, storage, management, transport and disposal of waste including mining waste such as residue deposits and residue stockpiles. Furthermore, regulates the rehabilitation of contaminated land and waste disposal facilities including mining waste facilities.
National Environmental Management Laws Amendment Act 26 of 2014	Introduces amendments in line with the MPRDA amendment act above to align the regulation and authorisation of mining activities between different acts and government departments such as the Department of Forestry, Fisheries and Environment (previously DEA) and Department of Mineral Resources and Energy (previously DMR).
National Environmental Management: Biodiversity Act 10 of 2004	Regulates the protection of biodiversity and the use of alien and invasive species on mining sites
National Environmental Management: Protected Areas Act 57 of 2003	Prohibits mining in certain protected areas.

LEGISLATION	OBJECTIVE AND RELEVANCE TO CLOSURE
National Environmental Management: Air Quality Act 39 of 2004	Regulates activities which may have a detrimental effect on ambient air quality including certain processes and dust generating activities such as tailings deposition.
Conservation of Agricultural Resources Act 43 of 1983	Regulates the eradication of weeds and invader plants on mining sites
National Heritage Resources Act 25 of 1999	Regulates the protection and conservation of the country's heritage resources, including mining related heritage where applicable.
Other legal measures **Land Use Planning Ordinances (provincial government level).**	Regulates the zoning of land for mining purposes, as well as the re-zoning of mining land post closure
Local by-laws (local municipality level).	Regulates a variety of issues on mine sites in terms of local regulations
Common law/case law.	Regulates issues such as nuisance, neighbour law, and all possible issues which may emanate from mine closure processes.
Regulations **GNR 1147 in Government Gazette (GG) 39425, 20 November 2015. Regulations pertaining to the financial provision for prospecting, exploration, mining or production operations.**	The primary regulations pertaining to the provisions of finances for the closure and rehabilitation of mine sites, throughout the lifecycle of the mine.
GNR 982, 983, 984 and 985 as amended in GG 38282 of 4 December 2014. Environmental Impact Regulations and Listed Activities.	Lists certain activities which require an environmental assessment and authorisation before they may be undertaken. Mine closure is specifically listed and is thus subject to an environmental assessment and the issuance of an environmental authorisation with approved closure plan.
GNR 632 in GG 39020 of 24 July 2015. Regulations for the	Sets out the regulatory framework for the management of residue deposits and stockpiles as well as the closure and rehabilitation of such facilities.

LEGISLATION	OBJECTIVE AND RELEVANCE TO CLOSURE
management of residue deposits and residue stockpiles.	
MPRDA: GNR 527 in GG 26275, 23 April 2004. Chapter 2: 'Mineral and Petroleum, Social and Environmental Regulations'.	Provided for the substantive regulations to give effect to the provisions of the Mineral and Petroleum Resources Act. Included several provisions relating to mine closure and rehabilitation
GNR 704 in GG 20119 of 4 June 1999, "Regulations of Use of Water for Mining and Related Activities aimed at the Protection of Water Resources".	Regulates the use of water on mining areas and introduces controls to prevent and mitigate the pollution of water resources within mining areas. Also regulates the management of residue deposits and residue stockpiles so as to prevent water resource pollution.
GNR 331 in GG 37603, 2 May 2014 "National Norms and Standards for the Remediation of Contaminated Land and Soil Quality".	Regulates the remediation of contaminated land including land contaminated by mining activities.
Regulations 847, 848 of 1994 of the Nuclear Energy Act 46 of 1999.	To be read with the Nuclear Energy Act above.
Other measures: accords, policies and strategies: The 1970 Fanie Botha Accord stated that mines that closed before 1956 are the responsibility of government, with those that closed afterwards to be remediated by the responsible company (Johannesburg Inner City Business Coalition (JCBC), undated).	The accord has for all intents and purposes been negated by the promulgation of the 2008 amendments to the Mineral and Petroleum resources act, which infers liability for closure to historic sites despite the 1956 cut off.
A Strategic Framework for Implementing Sustainable Development in the South African Minerals Sector: Towards Developing Sustainable Development Policy and	[Self-explanatory]

LEGISLATION	OBJECTIVE AND RELEVANCE TO CLOSURE
Meeting Reporting Commitments (DME, 2007 & DME, 2009).	
White Paper: A Minerals and Mining Policy for South Africa (the Minerals White Paper) N 2359/1998 in Government Gazette No 19344, 20 October 1998).	Sets out government policy for the exploitation of minerals in the country with specific focus on sustainability and equity.
White Paper on Environmental Policy for South Africa (The CONNEP White Paper) (Department of Environment Affairs and Tourism, 1997).	Government policy regarding the achievement of South Africa's environmental right and the regulation of activities which may have a detrimental impact on the environment, which by implication includes mining and mine closure.
White Paper on Integrated Pollution and Waste Management for South Africa: A Policy on Pollution Prevention, Waste Minimisation, Impact Management and Remediation March 2000. GN R227 GG 20978 of 17 March 2000 (DEAT, 2000).	Commits South Africa to a regulatory approach which implements inter alia the waste management hierarchy, and by implication applies to mining waste which includes residue deposits and residue stockpiles.
Water Conservation and Water Demand Management Strategy for the Industry, Mining and Power Generation Sector, August 2004.	[Self-explanatory]
National Water Resource Strategy II of 2013.	South Africa's strategy for the integrated management of the country's water resources, including the protection of water resources form pollution sources such as mine sites.

3.3. GOVERNMENT/INDUSTRY GUIDELINES AND PRACTICES

Table 4: Closure specific guidelines, Policies and Best practices

DOCUMENT DESCRIPTION	OBJECTIVE AND RELEVANCE TO CLOSURE
Environmental protection and rehabilitation • Evaluation of the Quantum of Closure-Related Financial Provision Provided by a Mine, • DME Guideline document 2004 available at http://www.dmr.gov.za/publications/summary/21-mineral-policy/588-guideline-document-for-the-evaluation-of-the-quantum-of-closure.html. • Handbook of Guidelines for Environmental Protection, Chamber of Mines (CEM (SA)) (Chamber of Mines of South Africa, 1979) Volume 1/1983: The design, operation and closure of metalliferous and coal residue deposits. • Volume 2/1979: The vegetation of residue deposits against water and wind erosion • Volume 3/1981: The rehabilitation of land disturbed by surface coal mining in South Africa. • Volume 5/1982: The Chamber of Mines erosion tester (comet) instrument (for determining the erodibility of slime). • Volume 7: Statutory requirements for environmental management. • Guidelines for the Rehabilitation of Mined Land (DMR: Chamber of Mines and Coaltech Research Association, 2007). • Template guide for: “Environmental Management Plan for Small-Scale Mining”. (DMR, 1998). • Mine Residue – Code of Practice (SABS 0286:1998). • Anglo American Mine Closure Toolbox Version 1 (AAplc) (Botha & Coombes, 2007). • Anglo American Mine Closure Toolbox Version 2 (AAplc) (Anglo American Plc, 2013).	Several guidelines have been published in South Africa relating to the protection of the environment as well as mine site rehabilitation. Although not being law these guidelines provide for substantive considerations which may be used by either regulators or mines in pursuing sustainable mine closure and rehabilitation.

DOCUMENT DESCRIPTION	OBJECTIVE AND RELEVANCE TO CLOSURE
Soil, waste and biodiversity • Framework for the Management of Contaminated Land DEA 2010. • Minimum Requirements for Waste Disposal by Landfill; Handling, Classification and Disposal of Hazardous Waste; Water Monitoring at Waste Management Facilities (DWAF, 1998). • Mining and Biodiversity Guideline – Mainstreaming biodiversity into the mining sector of 2013 (DEA, DMR, CM, South African Mining and Biodiversity Forum and South African National Biodiversity Institute, 2013).	As above, these guidelines pertain to particular aspects of protection of the environment relevant to mine site rehabilitation.
Water • Water Conservation and Water Demand Management (WC/WDM) Guideline for the Mining Sector in South Africa, June 2011 (DWA, 2011). • Guideline Document for the implementation of Regulations on use of water for Mining and related activities aimed at the protection of Water Resources, Second Edition, May 2000. • Best Practice Guidelines for Water Resource Protection in the South African Mining Industry (Department of Water Affairs, 2006): • Series A: Best Practice (BP) Guideline A1.1: Small Scale Mining Practices, Aug. 2006. • Series A: BP Guideline A1: Small Scale Mining, Aug. 2006. • Series A: BP Guideline A2: Water Management for Mine Residue Deposits, Jul. 2008 • Series A: BP Guideline A3: Hydrometallurgical Plants, Jul. 2007 • Series A: BP Guideline A4: Pollution Control Dams, Aug. 2007 • Series A: BP Guideline A5: Water Management for Surface Mines, Jul. 2008 • Series A: BP Guideline A6: Water Management for Underground Mines, Jul. 2008.	A series of guidelines drafted by the Department of Water Affairs with several relating specifically to mining and mine closure activities. The aim behind the guidelines being to ensure practices consistent with the National Water Act and the National Water Resource Strategy discussed above and in so doing ensuring protection of the water resource.

DOCUMENT DESCRIPTION	OBJECTIVE AND RELEVANCE TO CLOSURE
• Series G: BP Guideline G1: Storm Water Management, Aug. 2006. • Series G: BP Guideline G2: Water and Salt Balances, Aug. 2006. • Series G: BP Guideline G3: Water Monitoring Systems, Jul. 2007. • Series G: BP Guideline G4: Impact Prediction, Dec. 2008. • Series G: BP Guideline G5: Water Management Aspects for Mine Closure, Dec. 2008 • Series H: BP Guideline H1: Integrated Mine Water Management, Dec. 2008. • Series H: BP Guideline H2: Pollution Prevention & Minimization of Impacts, Jul. 2008. • Series H: BP Guideline H3: Water Reuse & Reclamation, Jun. 2006. • Series H: BP Guideline H4: Water Treatment, Sep. 2007.	
Socio-economic • Guideline Document for the Evaluation of the Quantum of Closure Related Financial Provision Provided by a Mine (DME/DMR, 2005). • The Socio-Economic Aspects of Mine Closure and Sustainable Development: Guideline for the Socio-Economic Aspects of Closure of 2010 (see Stacey *et al.*, 2010).	Socio economic guidelines for the closure mines, providing substantive guidance on mine closure costing and socio-economic impact mitigation for closure.

3.4. THE LEGAL FRAMEWORK APPLICABLE TO MINE CLOSURE IN SOUTH AFRICA.

Historically, the MPRDA[1] obligated the holder of rights or permits (here after the holder) to rehabilitate the environment to its natural state; or a predetermined state; or a land use which conforms to the generally accepted principle of sustainable development (South Africa, 2002: Swart, 2003). It also states that 'the holder is responsible for any environmental damage,

[1] Section 38(d) of the Minerals and Petroleum Resources Development Act 28 of 2002

pollution or ecological degradation inside and outside of its boundaries.'[2] It is also required that holders of rights must: 'give effect to the general objectives of integrated environmental management laid down in Chapter 5 of National Environmental Management Act'; and 'must consider, investigate, assess and communicate the impact of the mining activity on the environment in terms of s. 24(7) of NEMA'[3].

Notwithstanding the relevant provisions of NEMA, mining companies were at the time required by the MPRDA to undertake an Environmental Impact Assessment (EIA) process, and to submit an Environmental Management Plan (EMP) for approval by the DMRE.[4] The EMP was required to include the environment, socio-economic conditions and cultural heritage affected by the prospecting or mining operations, as well as baseline information to determine protection and mitigation measures.(Limpitlaw, 2005:Joughin, 1997) [5] Additionally, the EMP had to describe "…the manner in which the holder intends to: (i) modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; (ii) contain or remedy the cause of pollution or degradation and migration of pollutants; and (iii) comply with any prescribed waste standard or management standards or practices."[6] The EMP furthermore had to include the environmental objectives and goals for mine closure rehabilitation as well as a closure plan as outlined in Government Notice Regulation 527 regulation 62;[7] management of identified environmental risks and liabilities and financial provision, i.e. both the methods of determining the provision and the quantum thereof [8].

In theory, the estimation of financial provisions, as provided for in the MPRDA,[9] should have been in sync with the EMP and may have been based either on rehabilitation and closure cost estimation models developed by the mining concern or the DMRE guidelines (DMR, 2005). Methods of financial provision for the rehabilitation, management, and remediation of negative environmental impacts included: an approved contribution to a trust fund; a financial guarantee from a South African registered bank, or any other bank, or financial institution approved by the Director-General; a deposit into the account specified by the Director-General; and any

[2] Section 38(e) of the Minerals and Petroleum Resources Development Act 28 of 2002

[3] Section 38(a)-(b) of the Minerals and Petroleum Resources Development Act 28 of 2002

[4] Section 39(1) of the Minerals and Petroleum Resources Development Act 28 of 2002

[5] Section 39(a)-(b) of the Minerals and Petroleum Resources Development Act 28 of 2002

[6] Section 39(3d) of the Minerals and Petroleum Resources Development Act 28 of 2002

[7] Reg 62 in GN R527 in GG 26275 of 1 May 2004

[8] Reg 52 in GN R527 in GG 26275 of 1 May 2004

[9] Section 41 of the Minerals and Petroleum Resources Development Act 28 of 2002

other methods as the Director-General may determine.[10] Mining companies were required to annually assess their environmental liability and increase their financial provision in line with such an assessment.[11] Ministerial powers to recover costs in event of urgent remedial measures, and to remedy environmental damage were and are still provided for.[12] Finally, if a permit renewal was needed, the MPRDA[13] obligates the holder to report his or her environmental performance, rehabilitation to be completed and estimated cost thereof. In July 2013 s38-42 were repealed pending the much-anticipated move of the regulation of environmental considerations across to the NEMA dispensation. This created a temporary lacuna in the law, yet these sections were at the time still implemented as if still in force by the regulator.[14] Some months later in 2013 it was revealed that NEMA s24 (discussed below) would cater for these provisions.

At present the application for closure of a mine is regulated by both the provisions contained within the MPRDA s43[15] and those contained in NEMA[16] as discussed below. Mindful of the proposed amendments to s43 as contained within the MPRDA amendment Bill 2013, the current regulation of mine closure is discussed. [17] In terms of the MPRDA mine closure is largely regulated by section 43 as stated above. Section 43 provides an outline of the process which should be followed by regulatory bodies to grant closure certificates. Section 43(1) states that the holder of a mining right remains responsible for any environmental liability, pollution or ecological degradation, and the management thereof, until the Minister has issued a closure certificate. Section 43(4) of the MPRDA outlines the requirements which should be adhered to when applying for mine closure, as well as the submission process. Fundamentally, section 43(5) of the MPRDA stipulates that no closure certificate may be issued unless the Chief Inspector and each government department charged with the administration of any law which relates to any matter affecting the environment have confirmed in writing that the provisions pertaining to health and safety and management of potential pollution to water resources, the pumping and treatment of extraneous water and compliance to the conditions of the environmental authorisation have been addressed.

[10] Reg 53(1) in GN R527 in GG 26275 of 1 May 2004

[11] Section 41(3) of the Minerals and Petroleum Resources Development Act 28 of 2002

[12] Section 45-46 of the Minerals and Petroleum Resources Development Act 28 of 2002

[13] Section 24(2) of the Minerals and Petroleum Resources Development Act 28 of 2002

[14] National Environmental Management Act No 107 of 1998

[15] Section 43 of the Minerals and Petroleum Resources Development Act 28 of 2002

[16] National Environmental Management Act No 107 of 1998

[17] Minerals and Petroleum Resources Development Amendment Bill in GG 36523 of 31 May 2013

In assisting the Department of Water Affairs and Sanitation (DHSWS, previously DWA and DWs) in reaching such confirmation, the Best Practice (BP) Guidelines as listed above have been published (DWS, 2006). The above provisions of the MPRDA as amended, have extended the scope of the original section 43(1). These extended liabilities included in s43(1) now state that the holder of inter alia a mining right, remains responsible, apart from the original provisions relating to health, safety and water pollution for any: environmental liability; pollution; ecological degradation; the pumping and treatment of extraneous water; compliance to the conditions of the environmental authorisation, and; the management and sustainable closure thereof, until the Minister has issued a closure certificate in terms of the MPRDA. Inter alia the Department of Environmental Affairs has to be approached for comment as per the dictum of section 43(1).[18] This is a departure from the original prescription that only the DMRE and the DWS be consulted with regard to mine closure. The MPRDA also requires that the Council of Geoscience confirms in writing that all requisite reports in terms of section 21(1) have been compiled and submitted before a closure certificate is issued.[19]As noted above, the 8th of December 2014 saw a shift in terms the regulation of environmental impacts emanating from mining activities. Accordingly, provisions relating to the closure of mines are now contained within NEMA, specifically section 24 and accompanying regulations. At present all environmental considerations and impacts on mines are regulated in terms of the NEMA. The regulating authority, however, still remains DMRE, albeit that they now have to apply the NEMA rules. In accordance with section 24 N of NEMA, an Environmental Management Programme (EMPr) is required for any EIA submitted in relation to mining activities 24N(1A). Such an EMPr must contain measures regulating responsibilities for any environmental damage, pollution, pumping and treatment of extraneous water or ecological degradation as a result of prospecting or mining operations or related mining activities which may occur inside and outside the boundaries of the operations in question. In effect giving credence to the requirements of the MPRDA as discussed above.

Similar to the provisions contained within the repealed MPRDA sections, these requirements serve to hold mines liable for environmental pollution and degradation emanating from their mining activities. In order to ensure that such liabilities can be covered by the mine in question, section 24O of NEMA prescribes that when considering an application, the competent authority must consider the applicants ability to comply with the prescribed financial

[18] Section 43(1) of the Minerals and Petroleum Resources Development Act 28 of 2002

[19] Section 21(1) of the Minerals and Petroleum Resources Development Amendment Act no 49 of 2008. The MPRDAA deals with data in respect of reconnaissance and prospecting, as well as the keeping of records, and submission of information relating thereto to the Council of Geoscience.

provisions.[20] The financial provision referenced in section 24O is detailed in section 24P of NEMA, which requires that an applicant for an authorisation pertaining to mining or related activities must comply with the prescribed financial provision for the rehabilitation, closure and on-going post decommissioning management of negative environmental impacts.[21] This financial provision must be annually assessed on the basis of the mines environmental liability to the satisfaction of the minister of mineral resources. An annual independent audit is furthermore required in order to illustrate the adequacy of the financial provision.[22] Such a financial provision has to be maintained until such time as the minister issues a mine with a closure certificate.[23] The minister does, however, maintain the prerogative to retain any part of the financial provisions as is deemed fit so as to rehabilitate the closed mining or prospecting operation in respect of latent or residual environmental impacts. Further provisions with regard to the financial provisions for mine closure in terms of NEMA are contained within the regulations pertaining to the financial provision for the rehabilitation, closure and post closure of prospecting, exploration, and mining or production operations.[24] Section 24R of NEMA deals with environmental liabilities and states that the holder of a right, holder of and old order right, or holder of works (the listing of the different types of rights spanning the history of mining rights in South Africa, thus implying retrospectively of this section) remains responsible for any environmental liability, pollution, or ecological degradation, the pumping and treatment of extraneous water, the management and sustainable closure thereof, until the minister of mineral resources has issued a closure certificate in terms of the MPRDA. In effect, 24R applies a retrospective liability on mines, even those which were closed before the enactment of the MPRDA. This liability is also contained within section 28 of NEMA, albeit indirectly. In gearing up for the implementation of the NEMA provisions in so far as they relate to mining, and particularly mine closure, the DEA have drafted a number of regulations to flesh out the regulatory provisions as discussed above. These regulations deal with inter alia the financial provision for mine closure, as discussed above, and the management of residue deposits and

[20] Section 24O1(b)(iiiA) of the National Environmental Management Act No 107 of 1998

[21] Section 24P(1) of the National Environmental Management Act No 107 of 1998

[22] Section 24P(3) of the National Environmental Management Act No 107 of 1998

[23] Section 24P(5) of the National Environmental Management Act No 107 of 1998

[24] GNR 1147 in GG 39425 of 20 November 2015.

residue stockpiles.[25] This provision, namely 24R, read in accordance with the proposed perpetual liability amendment provision as contained in section 43 of the MPRDA bill 2013,[26]

One of the most significant changes to the regulatory regime is the requirement as of December 2014 for mines to conduct an EIA for closure. A closure certificate is thus required in terms of s43 of the MPRDA, along with an Environmental Authorisation in terms of s24 of NEMA, before a mine is deemed to have closed. The result being two authorisations, issued by the same ministry, along with approval from all other ministries related to the environment as discussed above. The required EIA in terms of Section 24 and GNR 983, must be accompanied by an approved closure plan in terms of GNR 982, which stipulates which closure activities will be undertaken, and how any adverse or negative environmental impacts will be mitigated.

It is against this background that the following closure plan has been drafted in accordance with GNR 1147 and the requirements stipulated therein for closure plans.

[25]The Regulations Regarding the Planning and Management of Residue Stockpiles and Residue Deposits from a Prospecting, Mining, Exploration or Production Operation were published in GNR 632 of 24 July 2015 in GG 39020.

[26] Section 43 of the Minerals and Petroleum Resources Development Amendment Bill in GG 36523 of 31 May 2013

4. STATE OF THE ENVIRONMENT

Regulations Reference: (b)(ii)	**This Section gives an overview of the environmental and social context that may influence, or be influenced by, the closure activities and post-mining land use.**

4.1. BIO-PHYSICAL ENVIRONMENT

This section of the Rehabilitation and Closure Plan gives a broad description of the regional state of the environment, as per the latest approved EMP (SLR, 2015), within which the mine expansion will be developed and will be closed. It should therefore be read within the context of mine closure.

The description of environmental and social aspects allows for proactive decisions to be made in line with sustainability principles while also keeping closure in mind.

Refer to the approved 2015 EMP (SLR, 2015) for detailed management or sector plans for the different components (geology, soils, biodiversity etc.). As part of the proposed expansion, a compilation of updated specific management plans should be included in future updates of this closure plan. The following sections should be updated accordingly as more recent information becomes available.

4.1.1. Water Resources

According to the Department of Water Affairs (2012), freshwater is becoming scarcer due to unsustainable use, climate change, resource pollution, increased demand and wastage. The increase in water abstraction has also led to the decline in biodiversity and ecosystem productivity in certain areas. Wetland areas are being destroyed and some rivers are drying up, contributing to the increase in endangered fish species. Settlements, mining, agriculture and industrial activities all have the potential to negatively affect the surface and ground water quality, it is therefore important to monitor and maintain water resources (Department of Water Affairs, 2012).

4.1.1.1. Surface water

The project area for the proposed expansion falls within the Lower Vaal water management area. The major rivers associated with this water management area include the Molopo River, Harts River and the Vaal River which ultimately drain into the Orange River. In this regard, all runoff from the project area for the proposed expansion is eventually drained westward into the Orange River (SLR Consulting, 2015).

The project area for the proposed expansion falls within the quaternary catchment D41K which has a gross total catchment area of 4216 km2, with a net MAR of 1.92 million cubic meters (mcm).

The major river within quaternary catchments D41K is the Ga-Mogara drainage channel which flows through the project area. The Ga-Mogara drainage channel forms a tributary of the Kuruman River. The Kuruman River flows west joining the Molopo River approximately 250 km from the confluence of the Ga-Mogara drainage channel and Kuruman River. The Molopo River drains in a southerly direction eventually joining the Orange River (SLR Consulting, 2015).

The Ga-Mogara drainage channel is located on the eastern boundary of the proposed project site. Any natural runoff from the proposed project site will drain in an easterly direction towards the Ga-Mogara drainage channel. Several minor non-perennial rivers form tributaries of the Ga-Mogara drainage channel in the broader Hotazel area; these include the Dooimansholte, Ga-Mmatshephe, Vlermuisleegte, Witleegte Rivers and various other unknown non-perennial rivers. Most notably the Witleegte River forms a confluence with the Ga-Mogara immediately upstream of the site (SLR Consulting, 2015).

A perched water table was identified at least 15 m beneath the Ga-Mogara drainage channel, the depth of which indicates that the river loses surface water flow to ground water as opposed to gaining water from a shallow water table. As there is no shallow water table beneath the riverbed, and very flat riverbed gradients of less than 0.17 %, there is no significant subsurface (base) flow in the Ga-Mogara drainage channel (SLR Consulting, 2015).

No water sampling within the proposed project site has been conducted because there are no permanent surface water features (SLR Consulting, 2015). Also, no wetlands are present within or immediately adjacent to the project area (Ecological Management Services, 2015).

Refer to the EIA (SLR, 2015) for detailed discussions on flow peaks and flood lines.

4.1.1.2. Groundwater

Groundwater is defined as water found beneath the ground surface between rock/soil pores and/or fractures (IUCN, 2016). The permeable layer (including the rock/soil pores and/or fractures) which transports the groundwater are referred to as aquifers (Monroe, Wicander, & Hazlett, 2007). The polluting of groundwater resources through for example the handling of hazardous waste can lead to losses to both the environment as well as third party users. Future dewatering due to mining may also lead to a decrease in the available water in the neighbouring areas (SLR, 2015).

Two aquifers are found underneath the project area for the proposed expansion, namely a shallow unconfined Kalahari aquifer and a deep confined fractured aquifer. Based on the DWA Aquifer Classification map, the project area for the proposed expansion falls in the "poor" aquifer region. This is defined as a " low to negligible yielding aquifer system of moderate to poor water quality". This refers to the shallow Kalahari bed aquifer, however, the yield in the deeper aquifer is also expected to be low (SLR Consulting, 2015).

An unconfined, shallow/perched aquifer occurs in the sediments and calcretes of the Kalahari Formation or on the contact with Kalahari clay or the underlying Dwyka Formation. The thick clay bed acts as a confining layer. While the sediments and calcretes could have a moderate hydraulic conductivity, the clay is relatively impermeable. Lithological logs and test pumping data indicate that there is a limited groundwater body accessed in these boreholes. This groundwater body is likely to be perched on low permeability layers and is of limited extent. It is consistent with the groundwater elevations showing a regional groundwater flow pattern towards the northeast. This suggests that the groundwater body accessed in these boreholes is the unconfined Kalahari aquifer. There is no significant aquifer associated with the Ga-Mogara drainage channel (SLR Consulting, 2015).

The fractured aquifer is present in the bedrock formations below the Kalahari Formation. These formations consist of low permeability hard rock. Groundwater occurrence is dependent on secondary faults and fractures, joints and other discontinuities. Although borehole yields in the deeper aquifer are generally low, structural features such as faults and fractures can produce higher yielding boreholes. It is however important to note that initially high borehole yields may decrease under sustained pumping, since water will be required to drain from the surrounding rock or connected fracture systems which have a lower yield (SLR Consulting, 2015).

Within the proposed expansion project area, the fractured aquifers are considered to occur in the Dwyka Formation, the Hotazel Formation and the Ongeluk Formations. Water levels associated with the proposed project site deepen towards the west and are shallower towards the east of the Ga-Mogara River where the Kalahari is underlain by lava or the Ongeluk Formation (SLR Consulting, 2015).

In terms of groundwater use and as part of the groundwater investigation conducted in 2015 (SLR Consulting, 2015), a total of fifteen boreholes were identified as part of the hydro census undertaken. As part of the hydro census (including pumping tests), a total of 13 groundwater quality samples were taken within and surrounding the project area for the proposed expansion. All boreholes sampled showed elevated concentrations of various elements. The pumping tests indicated that the groundwater yield potential of the aquifers at Mokala is

generally low (yield for shallow aquifer system was much lower than 1 L/s, while the yield for the deep aquifer was approximately 1 L/s) (SLR Consulting, 2015).

4.1.1.3. Biomonitoring

Biomonitoring can be defined as biologically orientated measurements with the aim of protecting, preserving, and correcting the biological integrity of natural systems. Biological integrity is in turn defined as “the maintenance of community structure and function characteristic of a particular locale” (de Zwart, 1995).

As per the approved EMP, it was recommended that a comprehensive monitoring programme of the protected trees within the area must be undertaken. An alien/invasive/weed management programmes will (wording in EMP) be implemented to control the spread of these plants onto and from disturbed areas (SLR, 2015). As these measures were only mentioned to be operational, no recommendations have been made in terms of post-closure monitoring.

As per the approved EMP (SLR, 2015), currently no biomonitoring is done at Mokala Manganese Mine, however it is recommended that this be done in future.

4.1.2. Climate and Climate Change

The project area for the proposed expansion falls within the Northern Steppe Climatic Zone, as defined by the South African Weather Bureau. This is a semi-arid region characterised by seasonal rainfall, hot temperatures in summer, and colder temperatures in winter (SLR, 2015).

The project area for the proposed expansion is characterised by hot summers and cool winters with rain generally occurring in the form of thunderstorms that last for short periods at a time during rainy periods. High evaporation rates reduce infiltration, while rainfall events can increase the erosion potential and the formation of erosion gullies. On average, wind speeds are below 5.3 m/s and not able to carry all types of dust particles (Airshed, 2015).

Monthly rainfall data for the Winton, Milner and Kuruman weather stations including rainfall data for quaternary catchment D41K was collected and analysed. The mean annual precipitation (MAP) for the catchment is 344 mm while the MAP from the Winton station is 335 mm (Table 5). Based on reliability, the adopted MAP for the proposed project site is 335 mm (SLR, 2015).

Detailed descriptions on the daily rainfall and evaporation data are provided within the EIA (SLR, 2015).

Table 5: Average Monthly Rainfall

Month	Rainfall (mm) – Winton (392148 W)
January	56.3
February	63.5
March	62.7
April	34.2
May	16.4
June	5.1
July	3.4
August	5.5
September	6.2
October	14.7
November	24.5
December	42.3
Annual	335

Reed and Stringer (2015) defines climate as “a statistical description of the weather, taking into account variables including temperature, wind speed and direction, and rainfall, over a long time period”.

Different models have been used to predict the increase in temperature, and studies that have used these models have indicated that the annual mean surface temperature could increase by 2 to 6 ºC by 2050. The rise in temperature will possibly lead to changes in the hydrological cycle (thus changes in evapotranspiration, precipitation, soil moisture and runoff) and possibly cause the inland areas of large continents to experience further drying (Verstraete & Schwartz, 1991; Ragab & Prudhomme, 2002).

The above mentioned should be considered as operations move closer to the closure and rehabilitation phase as this will affect the success of the rehabilitation activities with regards to vegetation establishment, growth and sustainability thereof.

4.1.3. Geology and Soils

4.1.3.1. Regional

Geology

The world’s largest land based sedimentary manganese deposit is contained in the Kalahari Manganese Field, situated 47 km north-west of Kuruman in the Northern Cape. The Kalahari

Manganese Field comprises five erosional, or structurally preserved, relics of the manganese bearing Hotazel Formation of the Paleoproterozoic Transvaal Supergroup. These include the Mamatwan-Wessels deposit (also known as the main Kalahari Basin), the Avontuur and the Leinster deposits, and the Hotazel and Langdon Annex/Devon deposits (SLR Consulting, 2015).

Within the main Kalahari Basin (from which the resources will be mined) is the largest of the five deposits in the Kalahari Manganese Field, comprising a basin with a strike length of approximately 56 km and a width varying between 5 and 20 km (SLR Consulting, 2015).

4.1.3.2. Local

Geology

The project area for the proposed expansion is located on the south-western outer rim of the Kalahari Manganese Field. Mokala intends to exploit the manganese from the Hotazel Formation (Transvaal Supergroup). The manganese deposits of the Kalahari Manganese Field represent structurally preserved erosional relics of the Paleoproterozoic Hotazel Formation of the Voelwater Subgroup (Transvaal Supergroup) along the axis of the Dimoten Syncline. The strata of the Hotazel Formation dip gently towards the west at about 5° to 8°. The Formation consists of Superior type iron-formation interbedded with manganese ore in three sedimentary cycles of which the lowermost unit is the most economically viable (SLR Consulting, 2015).

At the proposed project site, the Hotazel Formation is unconformably overlain by Early Permian Dwyka diamictite (tillite) of the Karoo Supergroup or Cenozoic Kalahari calcrete, clay and windblown sand. The Hotazel Formation is underlain by hyaloclastic, pillow and massive lavas of the Ongeluk Formation (Transvaal Supergroup) (SLR Consulting, 2015).

Refer to the EIA and EMP for Mokala Manganese Mine for detailed discussions on the geochemistry analyses in terms of leachate potential and mineralogy (SLR, 2015).

Soils

In general soils (Witbank, Molopo, Brandvlei and Clovelley) located within the project area for the proposed expansion are deep, well-drained sandy soils which allows for high infiltration rates and low organic content. These soils are therefore highly erodible. The Kinkelbos soil located within the Ga-Mogara drainage channel has a higher clay content when compared to the Witbank, Molopo, Brandvlei and Clovelley soil forms. It follows that water infiltration is slower in the Kinkelbos soil form resulting in a higher organic content and is less erodible than

the remainder of the soil forms located within the project area for the proposed expansion (Terra Africa Environmental Consultants, 2015).

Soil fertility within the project area for the proposed expansion is generally good, however due to the hot, dry climate and rapid drainage nature of the soils there is limited to no agricultural and irrigation potential (Terra Africa Environmental Consultants, 2015).

4.1.4. Land Capability and Usage

The current land capability within the project areas is a mixture of grazing, wilderness and wetland potential. The land capability within the project area will be changed with the placement of infrastructure. Therefore, impact management and rehabilitation planning are required to achieve acceptable post rehabilitation land capabilities (Ecological Management Services, 2015).

The specific soil properties and related potential govern the land classification of an area and with mining being able to transform the land capability. Mining can potentially affect the land capability if unmanaged and it is therefore important to understand all potential impacts. Land capability is divided into different classes including arable land, wetland, grazing and wilderness as per the classification system of the South African Chamber of Mines Land Capability Rating System (Ecological Management Services, 2015).

The specific land capability classes within the area include (Ecological Management Services, 2015):

- Wilderness/Conservation – Due to the historical borrow pit activities, the Molopo, Witbank and Brandvlei soil forms have wilderness land capability due to the **shallow soils found within the area**;
- Grazing – The proposed project site is primarily classified as **grazing**. These areas are mostly confined to the deeper soil form of the Clovelly soil form (could be suitable for dryland crop production if rainfall were higher).
- Wetland – Even though the Kinkelbos soil from is associated with wetland type capabilities, no wetland-based plant species were located within the project area for the proposed expansion (which was confirmed by soil samples and testpit data).

4.1.5. Biodiversity

4.1.5.1. Regional

The project area for the proposed expansion falls within the Kathu Bushveld and the Gordonia Duneveld which falls within the savanna biome. The Kathu Bushveld can be described as an open savannah while the Gordonia Duneveld consists of undulating dunes which is characterised by open shrubland with grasslands on the dune ridges (Mucina & Rutherford, 2006).

The project area for the proposed expansion falls within the Griqualand West Centre of Endemism which is an area with a high concentration of plant species with very restricted distribution. The Griqualand West Centre of Endemism is one of the 85 centres of endemism and one of 14 centres in southern Africa, and these centres are of global conservation significance. The Griqualand West Centre of Endemism is considered a priority in the Northern Cape, as the number of threats to the area is increasing rapidly and it has been little researched and is poorly understood. Furthermore, this centre of endemism is extremely poorly conserved, and is a national conservation priority. Centres of endemism are important because it is these areas which if conserved would safeguard the greatest number of plant species (Ecological Management Services, 2015).

4.1.5.2. Local

The project area for the proposed expansion falls within the Griqualand West Centre of Endemism and areas considered to have a high sensitivity include the Ga-Mogara drainage channel (Ecological Management Services, 2015).

Protected species in accordance with the National Forests Act of 1998 (Act 84 of 1998) (NFA) located within the proposed project area include *Acacia erioloba* (Camel thorn) and *Acacia haematoxylon* (Grey camel thorn). The *Vachellia erioloba* (Camel Thorn) is also listed as declining in terms of the International Union for Conservation of Nature (IUCN). Other red data species that are likely to occur within the project area for the proposed expansion in terms of the Northern Cape Nature Conservation Act (Act No 9 of 2009) (NCNCA) include *Harpagophytum procumbens* (Devils Claw), *Moraea longistyla*, (Goldblatt), *Moraea pallida* (Yellow Tulip), and *Babiana hypogaea* (Geelbobbejaantjie) (Ecological Management Services, 2015).

The project area has already been disturbed due to historical borrow pit activities, the old crusher yard, historical farming practices and on-going prospecting activities and the existing R380 traverses the proposed project site (Ecological Management Services, 2015).

A total of five alien and invasive species has been identified within the project area. These plants should be removed to be able to comply with the amendments to the regulations under the Conservation of Agricultural Resources Act, 1983 as well as Section 28 of the National Environmental Management Act, 1998 (Ecological Management Services, 2015).

In terms of fauna, farming practises and mining activities surrounding the project area for the proposed expansion have disturbed the local faunal population and as such very few faunal species were identified within the project area for the proposed expansion (Ecological Management Services, 2015).

Refer to the EIA (SLR, 2015) for detailed discussions on the ecological sensitivity of the proposed project site.

4.1.6. Air Quality

4.1.6.1. Regional

Particulate matter is the main pollutant of concern which may affect human health negatively. Exposure to elevated levels of particulate matter (PM10) can lead to cardiovascular and respiratory problems and have been correlated with a reduction in life expectancy (Aneja, Isherwood, & Morgan, 2012)

The total suspended particulate (TSP) matter as well as “particles with an equivalent aerodynamic diameter less than 10 µm (PM_{10})” can be released into the atmosphere due to mining activities. This can lead to increased mortality rates in addition to decreasing the visibility and impacting plants and animals in the area (Andrade, da Luz, Campos, & de Lima, 2016). It is, therefore, important to monitor the particulate matter being released to be able to make predictions and to mitigate the negative impacts (Chaulya, et al., 2003).

The project area for the proposed expansion is situated within a region that is surrounded by activities and infrastructure that contribute towards sources of emissions such as dust fallout and PM10. The proposed project will present additional sources of pollutants that may influence existing pollutant concentrations (Airshed, 2015).

4.1.6.2. Local

Dust emissions can be divided into two broad categories, namely process sources from industrial operations which changes the chemical or physical characteristics of the feed material and fugitive dust sources from solid particles which are spread by wind or emitted when machinery is used on exposed material. The amount of dust fall also differs due to weather conditions as well as changes in the source characteristics (Airshed, 2015).

Wind speed determines the potential of dust generation, the distance of downwind transport as well as the rate of dilution of pollutants (Airshed, 2015).

Refer to the EIA (SLR, 2015) for detailed discussions on the air quality and emission sources for the project area.

4.1.7. Topography, Visual Environment and Heritage

As per the EMP, the pre-mining topography can be described as relatively flat with a gentle slope towards the east where the Ga-Mogara flows along the eastern boundary of the proposed project site. The elevation on site varies between 1087 m to 1107 m above mean sea level (mamsl) (SLR, 2015).

The landscape has been described by the EIA (SLR, 2015) as the following:

"*The proposed project area lies in a flat, open area characterised by semi-arid vegetation and ephemeral drainage lines. Livestock and game farms and associated isolated farmsteads are typical of the region. To the south, north and southeast of the proposed project site, the landscape is characterised by scattered operational and closed mining operations and supportive infrastructure such as rail and road networks, powerlines, and the residential and business centre of Hotazel*".

Currently the topography has been disturbed by operations through the establishment and operation of the Waste Rock Dump (WRD). Project infrastructure and other mining activities constructed to date has also altered the natural topography of the site.

Historical borrow pit activities has disturbed the natural topography of the proposed project site, specifically on the eastern boundary of the proposed project site (SLR, 2015).

In terms of heritage/cultural resources, a number of heritage resources were identified at the Mokala Mine site. Results from two previous independent Heritage Impact Assessments (HIAs) recorded five Stone Age sites within the general area, however none of these sites will be impacted by the current expansion. Of the five sites identified, one heritage site is in the process of being removed (to allow for the realignment of the R380). Of the four remaining heritage sites, only site has been deemed low to medium heritage significance while the other three sites were classified as low heritage significance (SLR, 2021).

The palaeontological sensitivity of the project area was found to moderate based on the South African Heritage Resources Information Services (SAHRIS), however there is a possibility that the Hotazel Formation manganese ore body could contain stromatolites. Undisturbed areas around the Ga-Mogara River could be considered as heritage sensitive due to the arid nature

of the study area and that human occupation would historically be concentrated in these types of areas. Taking this into consideration, an additional specialist study was undertaken and concluded that it would be extremely unlikely that significant heritage and fossil resources may be found at the proposed project site (Bamford, 2021). Should something however be found, these resources are protected by the National Heritage Resources Act (No 25 of 1999) and may not be affected (demolished, altered, renovated, removed) without approval (PGS, 2015; Groenewald, 2013).

4.2. SOCIO-ECONOMIC ENVIRONMENT

All socio-economic aspects should be considered with closure in mind. The Mokala Manganese Mine should be aware of the impacts of closure on the socio-economic environment and should plan ahead, investigate sustainable options post-closure and limit dependency on the mine.

4.2.1. Population, Demography & Settlement Patterns

The Northern Cape Province has a population number of 1 145 861. The John Taolo Gaetsewe District Municipality (JTDGM) has a population number of 224 797 while the Joe Morolong Local Municipality (JMLM) has a total population of 89 531 people. The Hotazel community has a total of approximately 1 755 people (MTS, 2015).

As per the Social and Labour Plan (MTS, 2015), within the population profile of the Northern Cape Province, JTGDM and JMLM demonstrates a consistent average household size of four people per household despite the significant decline in population numbers between the regional levels. The local community of Hotazel has a slightly more favourable household size with an average of three members per household. These results are relatively typical of rural or semi-rural developing communities, however the low household density within Hotazel may be attributed to the fact that the town is largely a mining community established for and servicing surrounding mines. In general, Hotazel is well formalised in terms of basic services. This may be attributed to the Hotazel area being more urbanized having been developed and supported by surrounding mines in recent years (MTS, 2015).

4.2.2. Socio-economics

4.2.2.1. COVID-19 Pandemic

The novel coronavirus disease 2019 (COVID-19) was first discovered in November 2019 within China. As the virus spread rapidly over the globe, the World Health Organisation (WHO) declared COVID-19 as a global pandemic on 11 March 2020. On 1 March 2020, South Africa

recorded its first case whereafter a national state of disaster was declared and gazetted on 15 March 2020 with several restrictions being put in place. On 26 March 2020, a nationwide lockdown level 5 was enforced bringing most economic activities to a standstill. Since then, the lockdown levels varied with the current level at the time of compilation of this document being on an adjusted level 1.

When the pandemic started, the South African economy was already under considerable strain. Economic growth decreased from 3% in 2010 to 1.5% in 2019 with unemployment reaching 29.1% by the third quarter of 2019. The pandemic has since led to lower incomes for all households and a decrease in the Gross Domestic Product (GDP) (Chitiga-Mabugu, Henseler, Mabugu, & Maisonnave, 2021).

The specific impact, on mining globally, is still largely uncertain mostly due to the different mitigation measures implemented within the different countries. However, mining was brought to a temporary halt in South Africa in 2020 (Jowitt, 2020). Legislated limits on the number of staff were imposed on 26 March 2020 and intra-provincial travel restrictions also posed limitations within the mining sector.

4.2.2.2. Economy and Education

Its real economy has been dominated by iron ore and ferro alloys, with the mines linked to the coast by significant investments in rail transport. As a result, its economy has been closely linked to the price of iron ore, with rapid growth during the commodity boom and a significant slowdown since then. The province has seen significant out-migration over the past 20 years. The largest real-economy sector was mining, at 22% of the provincial economy, followed by agriculture at 7%, manufacturing at 3%, and construction at 2% (Municipalities of South Africa, 2017).

With regards to employment within the Northern Cape, the majority of the population within JGDM and JMLM are not economically active, while 48% of the Hotazel population is employed (MTS, 2015).

4.2.3. Health and Wellness

4.2.3.1. Overall

The life expectancy in South Africa for 2020 was estimated at 62.5 years for men and 68.5 years for woman with the infant mortality rate being 23.6 per 1000 live births. In South Africa, the overall HIV prevalence rate is estimated at 13.0% of the population, the total number is approximately 7.8 million people in 2020. Adults (aged between 15-49 years) living with HIV is estimated at 18.7% of the population (Statistics SA, 2020).

In the Northern Cape Province specifically, the leading causes of death include HIV, tuberculosis (TB), lower respiratory infections, diarrhoeal diseases and hypertensive heart disease. The leading causes of young adult (15-44 years) mortality in the Northern Cape Province can be attributed to HIV/AIDS followed by TB, homicide and road traffic accidents. Among the older adults (49-59), tuberculosis, ischaemic heart disease and stroke were the leading causes for both men and women. Chronic obstructive pulmonary disease and HIV/AIDS were the next leading causes and in the case of women, cervical cancer also featured (SAMRC, 2000).

4.2.3.2. COVID-19 Pandemic

COVID-19 had an immense impact on the health system of South Africa, however with the roll-out of the current vaccination program, the number of daily cases may decrease further within the future.

With regards to the total amount of COVID-19 cases, the Northern Cape Province had, at the time of compilation of this plan, 60 767 registered cases which is approximately 2.87% of the total cases in South Africa. Deaths due to COVID-19 amounted to 1 440 in Northern Cape and total recoveries amounted to 54 389 on 7 July 2021 (National Department of Health, 2021).

4.2.4. General Infrastructure and Services

In general, despite the relatively formalized housing infrastructure, basic services infrastructure appears to be far less formalized. The majority of the Northern Cape Province have access to flush toilets and Hotazel primarily utilising the flush toilets, however the JTGDM and the JMLM mostly make use of pit toilets. Hotazel have access to piped water inside dwellings and yards, however a large percentage of households rely on piped water to community stands at varying distances from their dwellings in both the JTGDM and the JMLM (MTS, 2015).

The Hotazel Town Planning Board with input from BHP Billiton are planning on extending the Hotazel residential area onto the farms Hotazel 280 and Kipling 281 in a westerly and northerly direction respectively. However, these plans have not yet been signed off (SLR, 2015).

Only a total of 64% of the households in the Northern Cape Province have their waste removed by the local municipality or a private company once a week. The occurrence of refuse removal by the JTGDM and JMLM constitutes only 26% and 6% of households respectively, however Hotazel is largely (96%) receiving the required services (MTS, 2015).

5. CLOSURE VISION AND UNDERLYING PRINCIPLES

Regulations Reference: (d)(ii)	**This Section describes the Closure vision, objectives and targets, which take into account the local environmental and socio-economic context, regulatory and corporate requirements as well as stakeholder expectations, where applicable for this plan.**

5.1. METHODOLOGY

"The aims of the closure plan are set out through its underlying vision, principals and objectives" according to the ICMM's Integrated Mine Closure Good Practice Guide (2nd ed.).

The ICMM's Integrated Mine Closure Good Practice Guide (2nd ed.) further states that "while the closure vision provides direction for closure, and the principals offer a general framework, the closure objectives provide concrete, site-specific, and typically measurable statements.

Both the closure vision and closure objectives should be informed by the knowledge base, particularly the mine's zone of influence (ZoI), socio-economic and environmental context, stakeholder relationships, country-specific requirements and other external drivers. These factors should lead to a closure vision and closure objectives that are aligned with the characteristics of the corporation and the mine and appropriate to the socio-economic setting".

The aforementioned was therefore considered when formulating the closure vision and closure objectives and targets for Mokala Manganese Mine.

5.2. CLOSURE VISION

By using the outcome of the closure workshops, consultations and applicable guidelines and policies as well as considering the specific commitments and targets of Mokala, the following preliminary Closure Vision was formulated:

"Mokala Manganese Mine is committed to responsible rehabilitation and mine closure and strives to leave a post closure land use which is safe, non-polluting and sustainable through transparent and comprehensive consultation with all relevant stakeholders."

5.3. CLOSURE OBJECTIVES AND TARGETS

This closure plan is prepared in terms of GNR 1147 of the National Environmental Management Act, 1998 (Act No. 107 of 1998). The following **principles for sustainability** as set out in this Act were considered and can be used as a guideline with mine closure in mind:

NEMA SECTION	DESCRIPTION OF PRINCIPLES OF SUSTAINABILITY
(4)(a) Sustainable development requires the consideration of all relevant factors including the following	
(a)(i)	*"That the disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied;*
a)(ii)	*That pollution and degradation of the environment are avoided or, where these cannot be altogether avoided are minimised and remedied;*
a)(iii)	*That the disturbance of landscapes and sites that constitute the nation's cultural heritage is avoided, or when it cannot be altogether avoided; is minimised and remedied;*
a)(iv)	*That waste is avoided; or, where it cannot be altogether avoided; minimised and re-used or recycled where possible and otherwise disposed of in a responsible manner*
a)(v)	*That the use and exploitation of non-renewable natural resources is responsible and equitable, and takes into account the consequences of the depletion of the resource*
a)(vi)	*That the development, use and exploitation of renewable resources and the ecosystems of which they are part do not exceed the level beyond which their Integrity is jeopardised*
a)(vii)	*That a risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions*
a)(viii)	*That negative impact on the environment and on people's environmental rights be anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied*
(4)(b)	Environmental management is integrated acknowledging that all elements of the environment are linked and interrelated, and it takes into account the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option

NEMA SECTION	DESCRIPTION OF PRINCIPLES OF SUSTAINABILITY
(4)(c)	Environmental justice must be pursued so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person particularly vulnerable and disadvantaged persons;
(4)(d)	Equitable access to environmental resources, benefits and services to meet basic human needs and ensure human well-being must be pursued and special measures may be taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination;
(4)(e)	Responsibility for the environmental health and safety consequences of a policy, programme, project, product, process, service or activity exists throughout its life cycle
(4)(f)	The participation of all interested and affected parties in environmental governance must be promoted and all people must have the opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation, and participation by vulnerable and disadvantaged persons must be ensured
(4)(g)	Decisions must take into account the Interests, needs and values of all interested and affected parties, and this includes all forms of knowledge, including traditional and ordinary knowledge
(4)(h)	Community well-being and empowerment must be promoted through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means
(4)(i)	The social, economic and environmental impacts of activities, including costs and benefits are considered, assessed and evaluated, and decisions are appropriate in the light of such consideration and assessment
(4)(j)	The right of workers to refuse work that is harmful to human health or the environment and to be informed of dangers must be respected and protected
(4)(k)	Decisions are taken in an open and transparent manner, and access is provided to information in accordance with the law
(4)(l)	There is intergovernmental co-ordination and harmonisation of policies, legislation and actions relating to the environment
(4)(m)	Actual or potential conflicts of interest between organs of state should be resolved through conflict resolution procedures;
(4)(n)	Global and international responsibilities relating to the environment must be discharged in the national interest

NEMA SECTION	DESCRIPTION OF PRINCIPLES OF SUSTAINABILITY
(4)(o)	The environment is held in public trust for the people, the beneficial use of environmental resources must serve the public interest and the environment must be protected as people's common heritage;
(4)(p)	The costs of remedying pollution, environmental degradation and consequent adverse, health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects are paid for by those responsible for harming the environment;
(4)(q)	The vital role of women and youth in environmental management and development must be recognised and their full participation therein must be promoted
(4)(r)	Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure".

It is also important to take section 43(3) (d) of the Mineral and Petroleum Resources Development Act (MPRDA 28 of 2002) into account as it includes the following **objectives for closure:**

- "Rehabilitate disturbed areas, excluding the tailings dam and return water dam, to their pre-mining land capability and use potentials. The rehabilitation of disturbed land will be to the extent that it is within compliance of current national environmental quality objectives;
- Limit the short- and longer-term impacts of pollution on surface and ground water and related biodiversity;
- Control the further generation of dust;
- Minimize the visual impact of the permanent features at the mine e.g., tailings dam;
- Ensure that people and animals are not harmed by falling off or into hazardous excavations or steep slopes. The management objectives for these are to minimize safety risks to the public and livestock;
- Limit the impact on staff whose positions become redundant on closure of the mine;
- Keep relevant authorities informed of the progress of the decommissioning phase;

- Submit monitoring data to the relevant authorities;
- Build and maintain meaningful relations with all stakeholders (I&AP's)".

According to the Economic and Land use Sustainability assessment (*Mercury Financial Consultants, October 2015*), as well as the current EMPs, the following closure objectives are considered for Mokala:

- To maintain a relatively flat topography;
- To maintain a functioning ecosystem;
- Moderate groundwater quality;
- Stable water table providing groundwater as a water supply source for domestic livestock watering;
- Quiet rural/urban environment;
- Environmental damage is minimized to the extent that they are acceptable to all parties involved;
- The land is rehabilitated to achieve a condition approximating its natural state, or so that the envisaged end use of wilderness and grazing is achieved;
- Backfilling of the open pit will take place on a concurrent basis;
- All surface infrastructure, excluding the realignment of the R380 road will be removed from site after rehabilitation and the open pit will be completely backfilled;
- Once the Ga-Mogara drainage channel has been permanently realigned, the design and establishment of the Ga-Mogara drainage channel permanent realignment will focus on replicating aspects of existing Ga-Mogara drainage channel. This will include the following closure objectives:
    - Natural flow will be allowed to continue when this occurs;
    - The design of the realignment will incorporate curves;
    - Vegetation within the realigned drainage channel will consist of plant and animal species endemic to the proposed project area; and
    - The design will incorporate natural soils.
- Mine closure is achieved efficiently, cost effectively and in compliance with the law; and

- The social impacts resulting from mine closure are managed in such a way that negative socio-economic impacts are minimized.

6. POST-MINING LAND USE/S

Regulations Reference: (e), (e)(i) & (e)(ii)	**This Section describes the proposed final post-mining land use, which is appropriate, feasible and possible of implementation for the overall project and per infrastructure or activity.** **It also gives a description of the methodology used to identify the final post-mining land use, including the requirements of the operations stakeholders, where applicable for this plan.**

6.1. METHODOLOGY

It should be noted that the planned post-mining land use has been identified for the current scenario at the time of compilation of this plan. This may change as the mine progresses and should be reviewed with each subsequent update of this plan.

In order to identify a post-mining land use, NEMA (Act No. 107 of 1998): Financial Provisioning Regulations, 2015 (No. R. 1147), is stating that you should have:

- “A proposed final post-mining land use which is appropriate, feasible and possible of implementation;
- Descriptions of appropriate and feasible final post-mining land use for the overall project and per infrastructure or activity and a description of the methodology used to identify final post-mining land use, including the requirements of the operations stakeholders; and
- A map of the proposed final post-mining land use (aligned to the EIA specialist studies)”.

The post-mining land use will be influenced by a few aspects, as described throughout this plan and can be improved through a typical tool, such as conducting a SWOT Analysis session (strength, weakness, opportunity, threat) between the mine owner and the landowner. Thereafter they will be better able to work together towards planning for mine closure and the post-mining land use.

It will assist in understanding both the internal strengths and weaknesses of the mine, and the external opportunities and threats posed by the environment.

The closure plan should be directed at exploiting the major strengths and opportunities, while avoiding or overcoming the threats and weaknesses.

The post-mining land use was determined, taking into consideration the State of the Environment for Mokala as well as the Closure vision and underlying closure objectives.

6.2. PROPOSED POST-MINING LAND USE/S

Refer to the specialist studies done as well as maps compiled as part of the EIA compiled for Mokala Manganese Mine which feeds into the proposed post-closure land use/s.

When taking the State of Environment into consideration and the feasibility of the implementation of the proposed land use at Mokala, the proposed project site is primarily classified as **grazing** (refer to Appendix A2 for the Post-mining Land Use map). Livestock and game farms and associated isolated farmsteads are typical of the region.

Future thinking should also include making land productive post-closure, creating more employment opportunities and to provide input for other industries. This includes the potential beneficial post-closure use of specific infrastructure as well, however the transfer of liability should be put in writing.

7. DESIGN PRINCIPLES, CLOSURE ACTIVITIES AND TECHNICAL SOLUTIONS

Regulations Reference: **(d), (d)(iii), (d)(iv), (d)(v), (d)(vi), (d)(vii)** **(f), (f)(i), (f)(ii)** **(i)** **(j)**	**This Section describes the Design principles, Closure activities and Technical solutions for all areas, infrastructure, activities and aspects both, within the mine lease area and off of the mine lease area associated with mining, for which the mine has the responsibility to implement closure actions.** **Alternative closure and post closure options are described, where practicable, within which the operation is located, as well as the preferred closure action within the context of the risks and impacts that are being mitigated.** **Any potential gaps in the plan are linked to an auditable action plan and schedule to address the gaps. Therefore, associated ongoing research are highlighted, as well as all assumptions made to develop closure actions (in absence of detailed knowledge on site conditions, potential impacts, material availability, stakeholder requirements and other factors for which information may be lacking). The Gap analysis can be used to identify and define any additional work that is needed to reduce the level of uncertainty for any applicable closure aspect.** **It also deals with the definition and motivation of the closure and post closure period, taking cognisance of the probable need to implement post closure monitoring and maintenance for a period sufficient to demonstrate that relinquishment criteria have been achieved.**

7.1. CLOSURE CRITERIA METHODOLOGY

A Closure Criteria table was compiled to list the design principles, closure activities and technical solutions for all current closure components. Refer to Table 6 for the Closure criteria, this should be read in conjunction with the costing sheets.

This document excludes Infrastructural, Bio-physical and Socio-economic aspects, that were already included in the previous EMPs and only includes the Mining aspects for the proposed:

- Opencast expansion (including mining of Kalagadi barrier pillar, on Kalagadi Mine property south of Mokala Mine);
- Waste Rock Dump expansion;
- New Waste Rock Dump;
- Topsoil Stockpile;
- Extended area for the Run of Mine (RoM) and Product footprint area;
- Top-up stockpile areas at the weighbridge (for ROM and product);
- Construction of a water pipeline, to be connected to the Sedibeng water pipeline on Gloria Farm 266, Portion 1 (on Assmang Manganese Mine's property)

Separate Rehabilitation plans and/ or Concurrent rehabilitation plans were not compiled, and all assumptions and actions are captured in this section, as well as the applicable appendices.

The Bio-physical and Socio-economic aspects do not currently have any possible cost implications, other than that already covered in the Infrastructural and Mining aspects. Should there be any additional cost implications, it should be included in the Closure Criteria sheets in future.

Additional care and maintenance are required in terms of the expansion project for 5 years Post-closure. This has been included in the Closure liability.

In order to reduce Socio-economic risks and the impact of closure on local communities, socio-economic aspects and related risks should be managed throughout the operational phase.

The Closure Criteria were based on the following:

- Comprehensive understanding of the site conditions;
- Interactive workshops with mine personnel, external consultants and specialists;
- Technical reports; and
- Knowledge and experience of similar projects.

Table 6: Mining aspects: Rehabilitation and Closure Criteria

MINING ASPECTS		
CLOSURE COMPONENTS	**REHABILITATION AND CLOSURE CRITERIA**	**ASSUMPTIONS / KNOWLEDGE GAPS**
Proposed Opencast / pit Expansion	• Backfill opencast voids with material from the local waste rock dump. • Shape and level backfilled area leaving area free draining with stormwater management structures. • Place 400m thick layer of topsoil on backfilled surface. • Establish vegetation which includes soil amelioration and cultivation actions.	• Ensure that agreements are in place with Kalagadi Mine regarding the mining of the barrier pillar. • The mining schedule were utilised to calculate the closure forecast for the open pit (strip-mining); volumes were based on the supplied mining schedule. • It was indicated that rollover mining will occur from Year 3 up to life of mine. • It has been assumed all inert demolition waste will be disposed of into the pit before final backfilling (pending formal authorization).
Proposed Waste Rock Dump Expansion (Overburden and spoils)	• Place 400mm thick layer of topsoil over profiled waste rock dump. • Rip on contour 500mm deep. • Establish vegetation which includes soil amelioration and cultivation actions.	• Assumed remaining waste rock dump has been reshaped down to 18 degrees as material is utilised for backfilling of the pit.
Proposed New Waste Rock Dump (Overburden and spoils)	• Same actions as existing WRD	• No associated cost, not yet constructed

MINING ASPECTS		
CLOSURE COMPONENTS	**REHABILITATION AND CLOSURE CRITERIA**	**ASSUMPTIONS / KNOWLEDGE GAPS**
Proposed Topsoil Stockpile (Overburden and spoils)	• Rip footprint area 500mm deep to alleviate any compaction. • Establish vegetation which includes soil amelioration and cultivation actions	• Assumed footprint will be left shaped and levelled as material is removed.
Run of Mine (RoM) and Product Footprint	• Place 400mm thick layer of topsoil over footprint area. • Rip footprint area. • Establish vegetation which includes soil amelioration and cultivation actions.	• Assumed footprint will be left shaped and levelled as material is removed.
Top-up Stockpile Areas (At Weighbridge)	• Place 400mm thick layer of topsoil over footprint area. • Rip footprint area. • Establish vegetation which includes soil amelioration and cultivation actions.	• Assumed footprint will be left shaped and levelled as material is removed.
Linear Infrastructure (Pipeline)	• Remove exposed pipeline valves and connection points. • Remaining infrastructure (pipeline) underground will be left post-closure.	• Ensure that all terms and conditions are met for the Agreement with Assmang Manganese, Black Rock Mine Operations.
Monitoring and Maintenance	• Allowance made for five years post-closure care and maintenance.	• Assumption that no additional monitoring will be required as part of expansion project.

7.2. ALTERNATIVE CLOSURE AND POST CLOSURE OPTIONS

The potential alternative closure options are dependent on the applicable Statutory and Corporate related requirements, as outlined in Section 3 of this document, and includes current Mine lease agreements and expectations from the landowner, as well as the approved closure commitments stipulated in the EMP.

It is important to note that the specific sections below will also influence any closure and post closure alternatives to be considered:

- Section 4: the environment in which the project is located;
- Section 6: the feasible and practical post-mining land uses;
- Section 8: the risks associated with such an alternative option (a cost-benefit analysis may also be needed in future if there are any alternatives being considered);
- Section 9: the expectations from external stakeholders, if any (other than the landowner or Government).

8. RISK ASSESSMENT

Regulations Reference: (c), (c)(i), (c)(ii), (c)(iii), (c)(iv) & (c)(v)	**This Section describes the findings of the environmental risk assessment, leading to the most appropriate closure strategy.** **It also deals with the risk assessment methodology, identification of indicators that are most sensitive to potential risks and the monitoring of such risks.** **The conceptual closure strategies are described to avoid, manage and mitigate the impacts and risk. Reassessment of the risks are done to determine whether, after the implementation of the closure strategy, the latent or residual risk has been avoided and / or how it has resulted in avoidance, rehabilitation and management of impacts and whether this is acceptable to the mining operation and stakeholders.**

8.1. CLOSURE RISK WORKSHOPS

All potential risks, associated with the closure of the Mokala Manganese Mine Operations, were identified, only focussing on the proposed expansion areas.

The following information was considered as part of the process to compile the worksheets:

- Legislative / statutory and corporate requirements;
- Existing mine closure objectives, closure visions and land use opportunities post-closure;
- Mine closure options and scenarios;
- The baseline information which describes the current state of the environment (SOE);
- Existing mine closure plans and previously identified impacts; and
- Stakeholder engagement outcomes

8.2. CLOSURE RISK MATRIX

The identified risks were captured in the worksheets that reflect all the respective risks for each closure component.

These risks were individually evaluated in terms of a risk matrix and ranked for the closure scenarios before and after implementation of the mitigation measures / rehabilitation and closure criteria. Refer to Appendix B for the Anglo-American Risk Matrix and Closure Risk Assessment. The following tables are explaining the risk matrix and methodology used.

The identified risks were rated according to “probability / likelihood” and “consequence of occurrence” as described in the table below.

Table 7: Criteria to Determine Probability

PROBABILITY / LIKELIHOOD		
ALMOST CERTAIN 1yr	**5**	The unwanted event has occurred frequently: Occurs in order of one or more times per year & is likely to reoccur within 1 year.
LIKELY 3yrs	**4**	The unwanted event has occurred infrequently; Occurs in order of less than once per year & is likely to reoccur within 3 years.
POSSIBLE 10yrs	**3**	The unwanted event has happened at some time; Or could happen within 10 years.
UNLIKELY 30yrs	**2**	The unwanted event has happened at some time; Or could happen within 30 years.
RARE >30yrs	**1**	The unwanted event has never been known to occur; Or it is highly unlikely that it will occur within 30 years.

To determine the possible consequence, different criteria were used for each of the following disciplines or areas of responsibility to mitigate risks and impacts:

- Safety;
- Occupational Health;
- Environment;
- Financial;
- Legal and Regulatory;
- Social / Community; and
- Reputation

Table 8: Criteria to Determine the Consequence of Safety Impacts

CONSEQUENCE FOR SAFETY	
1 INSIGNIFICANT	First aid case.
2 MINOR	Medical treatment case.
3 MODERATE	Lost time injury.
4 HIGH	Permanent disability or single fatality.
5 MAJOR	Numerous permanent disabilities or multiple fatalities.

Table 9: Criteria to Determine the Consequence of Health Impacts

CONSEQUENCE FOR OCCUPATIONAL HEALTH	
1 INSIGNIFICANT	Exposure to health hazard resulting in temporary discomfort.
2 MINOR	Exposure to health hazard resulting in symptoms requiring medical intervention and full recovery (no loss time).
3 MODERATE	Exposure to health hazards/ agents (over the OEL) resulting in reversible impact on health (with lost time) or permanent change with no disability or loss of quality of life.
4 HIGH	Exposure to health hazards/ agents (significantly over the OEL) resulting in irreversible impact on health with loss of quality of life or single fatality.
5 MAJOR	Exposure to health hazards/ agents (significantly over the OEL) resulting in irreversible impact on health with loss of quality of life of a numerous group/ population or multiple fatalities.

Table 10: Criteria to Determine the Consequence of Environmental Impacts

CONSEQUENCE FOR ENVIRONMENT	
1 INSIGNIFICANT	Lasting days or less. Limited to small area (metres). Receptor of low significance/ sensitivity (industrial area).

CONSEQUENCE FOR ENVIRONMENT	
2 MINOR	Lasting weeks. Reduced area (hundreds of metres). No environmentally sensitive species/ habitat).
3 MODERATE	Lasting months. Impact on an extended area (kilometres). Area with some environmental sensitivity (scarce/ valuable environment).
4 HIGH	Lasting years. Impact on sub-basin. Environmentally sensitive environment/ receptor (endangered species/ habitats).
5 MAJOR	Permanent impact. Effects a whole basin or region. Highly sensitive environment (endangered species, wetlands, protected habitats).

Table 11: Criteria to Determine the Consequence of Financial Impacts

CONSEQUENCE FOR FINANCIAL	
1 INSIGNIFICANT	No disruption to operation/ Less than 1% of current liability estimate.
2 MINOR	Brief disruption to operation/ 1% to less than 3% of current liability estimate.
3 MODERATE	Partial shutdown of operation / 3% to less than 10% of current liability estimate.
4 HIGH	Partial loss of operation / 10% to less than 30% of current liability estimate.
5 MAJOR	Substantial or total loss of operation / 30% or higher of current liability estimate.

Table 12: Criteria to Determine the Consequence of Legal and Regulatory Impacts

CONSEQUENCE FOR LEGAL & REGULATORY	
1 INSIGNIFICANT	Technical non-compliance. No warning received. No regulatory reporting required.
2	Breach of regulatory requirements.

CONSEQUENCE FOR LEGAL & REGULATORY	
MINOR	Report/involvement of authority. Attracts administrative fine.
3 MODERATE	Minor breach of law. Report/investigation by authority. Attracts compensation/ penalties/ enforcement action.
4 HIGH	Breach of the law. May attract criminal prosecution, penalties/ enforcement action. Individual licence temporarily revoked.
5 MAJOR	Significant breach of the law. Individual or company lawsuits. Permit to operate substantially modified or withdrawn.

Table 13: Criteria to Determine the Consequence of Social/Community Impacts

CONSEQUENCE FOR SOCIAL / COMMUNITY	
1 INSIGNIFICANT	Minor disturbance of culture/ social structures.
2 MINOR	Some impacts on local population, mostly repairable. Single stakeholder complaint in reporting period.
3 MODERATE	Ongoing social issues. Isolated complaints from community members/ stakeholders.
4 HIGH	Significant social impacts. Organized community protests threatening continuity of operations.
5 MAJOR	Major widespread social impacts. Community reaction affecting business continuity. “License to operate” under jeopardy.

Table 14: Criteria to Determine the Consequence of Reputational Impacts

CONSEQUENCE FOR REPUTATION	
1 INSIGNIFICANT	Minor impact. Awareness/ concern from specific individuals.
2 MINOR	Limited impact. Concern/ complaints from certain groups/ organizations (e.g., NGOs).
3 MODERATE	Local impact.

CONSEQUENCE FOR REPUTATION	
	Public concern/ adverse publicity localised within neighbouring communities.
4 HIGH	Suspected reputational damage. Local/ regional public concern and reactions.
5 MAJOR	Noticeable reputational damage. National/ international public attention and repercussions.

The risk rating matrix was coupled to the criteria discussed in the above tables for probability / likelihood and consequence. The matrix was applied, taking into consideration the site-specific risks, in accordance with the area of assessment. The classification of the identified risks was presented in terms of the following risk ratings and risk levels:

Table 15: Risk Ratings and Levels

RISK RATING	RISK LEVEL
21 to 25	H - High
13 to 20	S - Significant
6 to 12	M - Medium
1 to 5	L - Low

8.3. RISK ASSESSMENT SUMMARY

Refer to Appendix B for the comprehensive Closure Risk Assessment sheets, indicating all sensitive receptors and risk specific closure strategies.

No risks were indicated with **significant or high** rankings post-mitigation, as the Mokala Manganese Mine is providing for the necessary closure criteria / mitigation measures, as well as ongoing monitoring and maintenance in the project area.

9. SOCIAL CLOSURE PLANNING AND CLOSURE CONSULTATION

Regulations Reference: (b)(iii)	This Section describes the Stakeholder issues and comments that have informed the plan, where applicable.

9.1. STAKEHOLDER ENGAGEMENT PLAN AND APPROACH

Stakeholder engagement aims to achieve comprehensive consideration and understanding of the views of the various stakeholders to the closure planning process. Stakeholder engagement will ensure that the views, concerns, and proposals of those affected by, or having an interest in the mining operations of the company are addressed.

Contact sessions and workshops took place during this process and included personnel from Mokala Manganese (internal stakeholder consultation). Refer to Appendix C.

No other external stakeholder engagement was conducted, other than that what is part of the EIA process, for the compilation of this plan for the Mokala Manganese Mine.

9.2. SUMMARY OF ISSUES RAISED

All inputs from the internal stakeholder consultation, with mine personnel, were taken into consideration in this plan and its supporting documentation. All future stakeholder issues, concerns and comments should further inform the update of this Closure plan.

10. WORK BREAKDOWN STRUCTURE AND CLOSURE SCHEDULE

Regulations Reference: **(g), (g)(i), (g)(ii), (g)(iii)** **&** **(h), (h)(i), (h)(ii), (h)(iii)**	**This Section describes the schedule of actions for final rehabilitation, decommissioning and closure and link with the current mine plan where possible. All assumptions and schedule drivers are described.** **The spatial map or schedule is linked with Appendix 3 of GNR1147 and shows the planned spatial progression throughout the operations.** **The organisational capacity, structure and responsibilities to implement the plan are indicated, where applicable. If necessary to build closure competence, the required training and capacity building are described in this section.**

This section should be updated with future reviews of the closure plan for Mokala.

A gap analysis should be done as part of the site wide Closure Criteria. The gap analysis includes an auditable action plan and schedule to address the gaps. These aspects, are linked to a Work Breakdown structure that captures the following:

- The specific **action** requiring additional or further investigation;
- **Priority Level**, indicating the timeframe linked to it (e.g., Immediate, within next financial year or only long term – 10 years before closure);
- A specific **Responsible Person** is linked to each of these actions (e.g., Environmental Manager or Processing);
- **Completion Status**, e.g., to indicate whether the specific action should still be initiated, if it is in progress or completed.

The Closure schedule should be refined with the update of this closure plan, the inclusion of the mine plan and the compilation of a Concurrent Rehabilitation plan, as per the regulatory requirements of GNR 1147.

11. CLOSURE COST ESTIMATION

Regulations Reference: **(k), (k)(i), (k)(ii), (k)(iii)**	**This Section describes the Closure cost estimation procedure, which ensures that identified rehabilitation, decommissioning, closure and post-closure costs, whether ongoing or once-off, are realistically estimated and incorporated into the estimates.** **Cost estimates for operations, or components of operations that are more than 30 years from closure will be prepared as conceptual estimates with an accuracy of ± 50 per cent. Cost estimates will have an accuracy of ± 70 per cent for operations, or components of operations, 30 or less years (but more than ten years) from closure and ± 80 per cent for operations, or components of operations ten or less years (but more than five years) from closure. Operations with 5 or less years will have an accuracy of ± 90 per cent. Motivation must be provided to indicate the accuracy in the reported number and as accuracy improves, what actions resulted in an improvement in accuracy.** **The closure cost estimation includes an explanation of the closure cost methodology, auditable calculations of costs per activity or infrastructure and cost assumptions.** **The closure cost estimate must be updated annually during the operation's life to reflect known developments, including changes from the annual review of the closure strategy assumptions and inputs, scope changes, the effect of a further year's inflation, new regulatory requirements and any other material developments.**

11.1. CLOSURE COST ESTIMATION PROCEDURE AND METHODOLOGY

11.1.1. Liability Model Methodology

The approach followed to determine the financial provision required for Appendix 4 of GNR 1147 Final Rehabilitation, Decommissioning and Mine Closure Plan is as follows:

- The costing model used were developed to address all requirements set out in GNR 1147 and is aligned with all closure components identified;

- The costing model provides the following output:
  - Executive Summary (Summary of all closure components and associated costs where applicable);
  - Preliminary & General (Allocation of P&G's per components and provides weighted P&G's as certain P&G's allowances can vary per component);
  - Contingencies (Allocation of Contingencies per components and provides weighted Contingencies as certain Contingency allowances can vary per component);
  - Closure Components Summary (Provides a summary of all costs per closure component). The five main closure components have been identified namely:
    - Infrastructural Aspects;
    - Mining Aspects;
    - Biophysical Closure Aspects;
    - Social Closure Aspects; and
    - General Aspects.
  - Closure Components (Breakdown of the five main closure components); and
  - Rates Table (Unit rates for various actions required).
- The following information is captured for each closure component where applicable:
  - Reference Map (Reference map number representing the associated closure component);
  - GEO Reference (Reference number for each closure component as represented on the reference map);
  - Year Captured (When each component was captured into the model or updated);
  - Cost Component (Name of closure component captured);
  - Description (Breakdown of the properties per cost component);
  - Supporting Documentation (Hyperlink to associated supporting information such as drawings, designs or Bill of Quantities);
  - Liable (Yes or No, indication if the mine is liable for the component or not);
  - Rate Code (Assigned rate code from the rates table);
  - Quantity (Quantity per component captured);
  - Unit (Unit of measurement);

- Unit Rate (Rate assigned from the rate code aligned to the activity);
- Unit Total (Total amount for each component);
- Liable Value (Presentation of the total amount liable for per component); and
- Notes (Captures any assumptions or dedicated information).

11.1.2. Assessment Methodology

The approach followed with the determination of the closure costs could be summarized as follows:

- Review of available information, identification of infrastructure that would need to be decommissioned at closure;
- Gathering of relevant data which forms the basis of the calculation;
- All proposed activities were assigned with a reference number which can be referenced directly to the costing model;
- The following facilities forms part of the financial provision calculation:
  - Proposed water supply line;
  - Proposed opencast expansion, including the barrier pillar;
  - Proposed Waste Rock Dump expansion;
  - Proposed New Waste Rock Dump;
  - Proposed ROM, Product and Top Up stockpile; and
  - Proposed Topsoil Stockpile.
- A reference map was created indicating the position of the proposed facilities in relation to the existing infrastructure (Appendix A1);
- Closure criteria was developed and workshopped with Mokala as part of the liability assessment (Table 6);
- Compilation of a Bill of Quantities capturing the quantities and actions relating to the closure of the different closure aspects (in Microsoft excel format – Appendix D); and
- Unit rates from E-TEK's database were updated to be aligned with the current market-related rates acquired from local civil- and demolition contractors. (Note – these rates refer to closure conditions when the mine is no longer operational).

11.2. AUDITABLE CALCULATIONS OF COSTS

Refer to Appendix D (Closure Liability Model) for the detail cost breakdown per closure component.

11.3. ASSUMPTIONS FOR THE CLOSURE COST ESTIMATION

The following general and site-specific cost assumptions and qualifications are described below:

11.3.1. General Costing Assumptions

- The closure costs were determined and presented in terms of E-TEK's understanding of the currently applicable requirements of GNR 1147;
- Currency of estimate: South African Rands (ZAR);
- Based on the output required a 1–10-year closure forecast was calculated including a LoM cost based on the following timelines:
    - Year 1 – Premature Closure (FY2021); and
    - Year 2 – 10 Closure Forecast (FY2022 – FY2030).
- Quantities and volumes calculated as part of the closure forecast were obtained from the relevant mine plan and associated drawings;
- Costing was based on current value and no allowance was made for future value escalation as per the legislative requirements;
- As per GNR 1147 no allowance was made to offset the value of scrap steel and or salvageable equipment to the liability;
- It was accepted that all information used to support the costing supplied by Mokala Manganese and Specialists was accurate and true; this report only addresses the decommissioning and reclamation costs, equating to an outside (third party) contractor establishing on-site and conducting reclamation-related work. Other components such as staffing of the site after decommissioning, the infrastructure and support services (e.g., power supply, etc.) for this staff as well as workforce matters such as separation packages, re- training /re-skilling, etc. are outside the scope of this report;
- Based on the above, dedicated contractors would be commissioned to conduct the demolition and reclamation work on the site. This would inter alia require establishment and overhead costs for the contractors and hence, the allowance for preliminary and general (P&Gs) in the cost estimate;
- Allowance has also been made for third party contractors and consultants to conduct post-closure care and maintenance work as well as compliance monitoring;
- The financial provision calculated represents the financial requirements to implement the closure criteria identified and agreed upon as part of the closure plan; and
- Weighted percentages for P&Gs and Contingencies have been applied Value-Added Tax (VAT) is also included:

- P&G's – 6% Overall Allowance.
- Contingencies – 10% Overall Allowance; and
- VAT – 15% Overall Allowance.

11.3.2. Site Specific Costing Assumptions

11.3.2.1. Infrastructural Aspects

- Mokala is currently in the process to construct all infrastructure as part of the approved operation.
- No financial provision was made for any infrastructural aspects.
- Changes in terms of the current layout (proposed project activities) will be made but no additional infrastructure will be constructed.
- The proposed water supply line will be subsurface (1m below ground), and it was assumed that the pipeline will remain post closure. All exposed infrastructure part of the pipeline such as valves and connections will be removed.

11.3.2.2. Mining Aspects

- Mining activities as part of the current approved operation is underway.
- Only volumes as part of the pit expansion were taken into consideration for the liability calculation, volumes obtained from current mine plan[27].
- The pit will be backfilled completely and domed (whaleback) accordingly to allow for settlement at any stage of possible closure.
- It was assumed that all benches of the waste rock dumps will be left at an angel of below 18 degrees, as material utilised for backfilling of the pit is removed and no additional allowance was made for reshaping.
- The proposed waste rock dump expansion of the existing waste rock dump will be constructed in year 1.
- The proposed topsoil stockpile will be constructed in year 1.
- The construction of the proposed new waste rock dump falls outside the 10-year forecast and does not form part of the current financial provision.

[27] *Note: As part of the current approved mine plan, the underground works will be expanded by means of additional pillars. However, as these potential expansions fall outside the 10-year forecast, it has not been included within the current closure planning or closure estimate. This is to be included with the next update of this closure plan.*

12. MONITORING, AUDITS AND REPORTING

Regulations Reference: **(d)(v)** **&** **(l), (l)(i), (l)(ii), (l)(iii)**	**This Section takes cognisance of the probable need to implement post closure monitoring and maintenance for a period sufficient to demonstrate that relinquishment criteria have been achieved.** **The Monitoring, auditing and reporting requirements (which relates to the risk assessment, legal requirements and knowledge gaps as a minimum) include:** **A schedule outlining internal, external and legislated audits of the plan for the year, Including the person responsible for undertaking the audit(s); the planned date of audit and frequency of audit as well as an explanation of the approach that will be taken to address and close out audit results and schedule.** • **A schedule of reporting requirements providing an outline of internal and external reporting, including disclosure of updates of the plan to stakeholders, where necessary.** • **A monitoring plan which outlines parameters to be monitored, frequency of monitoring and period of monitoring.** • **An explanation of the approach that will be taken to analyse monitoring results and how these results will be used to inform adaptive or corrective management and/or risk reduction activities.**

The Monitoring plan and applicable Key Performance Indicators (KPIs) should be included in the update of this closure plan and with the compilation and support of the Rehabilitation plan.

12.1. DEMONSTRATION OF REHABILITATION PERFORMANCE

No additional monitoring is required in terms of the expansion project, only five years Post-closure Care and Maintenance is included. It is envisaged that a five-year demonstration period will be required to confirm the success of rehabilitation.

Following the completion of earthworks and vegetation establishment, a visual inspection will be undertaken to inform corrective action required, if needed. Thereafter, ongoing monitoring

and corrective actions are envisaged at the time of compiling this plan as indicated in the closure criteria in Table 6.

Figure 3 illustrates the overview of the process for the Rehabilitation plan roll out and Performance monitoring, starting with the Baseline site performance assessment, towards the Final site performance assessment. It is described in the sections below.

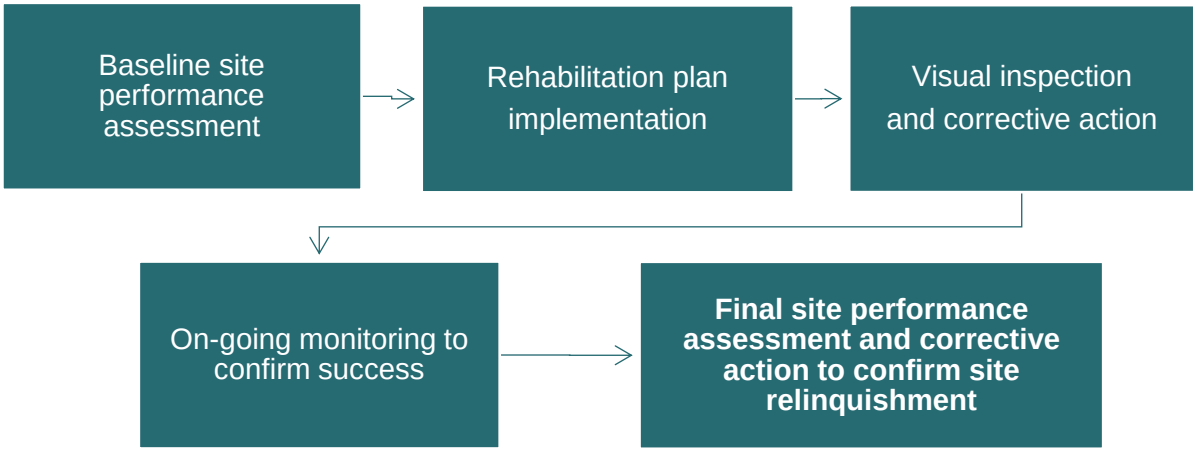

Figure 3: Illustration of the Rehabilitation plan roll out and Performance monitoring.

12.1.1. Baseline Environmental Site Performance Assessment

A baseline site performance assessment (largely based on existing information and supplemented by a dedicated site walkover) has to be conducted prior to rehabilitation implementation.

The aim of the environmental site performance assessment is to establish the status quo/baseline and knowledge base against which results of monitoring conducted after rehabilitation will be measured. Additionally, this will support the environmental permitting for decommissioning of the site in terms of the provisions of NEMA.

12.1.2. Monitoring and Corrective Action

The rehabilitation performance/progress should be documented in a dedicated annual rehabilitation performance report to be submitted to Mokala, until relinquishment criteria have been achieved. The report should reflect on the outcome of monitoring undertaken, rehabilitation performance and corrective action required.

The monitoring objectives, network, sampling routine and analysis for specific bio-physical closure aspects should always be refined with each updated of this plan.

12.1.3. Final Site Performance Assessment

Following completion of rehabilitation and/or the demonstration period of five years (to be confirmed and updated in future and as the mine gets closer to closure) a final performance assessment should be undertaken to document the success of rehabilitation and the corrective action undertaken. The final site performance assessment will be used to document the success of rehabilitation.

The Rehabilitation Monitoring and Measurements listed in Table 16 indicate the general requirements for closure to be met as aligned with the approved EMP and the relevant regulatory objectives listed in Section 5.3. It is recommended that these criteria are to be included in the proposed amendment of the EMP and to be applied site wide and not merely to the expansion. These criteria are also to refined with subsequent updates of this closure plan.

Table 16: Rehabilitation Monitoring and Measurement

COMPONENT / ASPECT		MONITORING		PERFORMANCE/SUCCESS CRITERIA	CORRECTIVE ACTION
		METHODOLOGY	FREQUENCY/DURATION		
WATER RESOURCES	Surface water quality (forms part of ongoing site-wide operational monitoring)	• Undertake monitoring of the surface water quality during the operational period according to existing monitoring programmes.	• Monthly during the operational period.	• Acceptable threshold levels of salts, metals and other potential contaminants are maintained; and • The applicable thresholds do not pose a threat to surrounding aquatic ecosystems, land uses or land users.	• As reflected in relevant IWWMP.
	Groundwater (forms part of ongoing site-wide operational monitoring)	• Undertake ongoing monitoring of the ground water quality during the operational period according to existing monitoring programmes.	• Quarterly during the operational period.	• Acceptable threshold levels of salts, metals and other potential contaminants are maintained; and • The applicable thresholds do not pose a threat to surrounding land uses or land users (groundwater users for domestic or agricultural purposes).	• Implement commitments in IWWMP.

COMPONENT / ASPECT		MONITORING		PERFORMANCE/SUCCESS CRITERIA	CORRECTIVE ACTION
		METHODOLOGY	FREQUENCY/DURATION		
SENSITIVE HABITATS & BIODIVERSITY	Vegetation establishment	Determine whether concurrently established vegetation provides an effective cover and aids in controlling erosion, by undertaking the following: • Inspect rehabilitated areas to assess vegetation establishment and early detection of erosion in recently planted/seeded areas (for 3 months); and • Assess rehabilitated areas by means of field inspections. During these assessments measurement of growth performance should be made of:	Planting should be undertaken at the start of the rainy season and monitoring undertaken as follows: • After1 month continue monitoring twice more for first quarter, • Quarterly for the rest of the year and then, • Annually thereafter.	• No evidence of significant erosion is present; • Self-sustaining vegetation establishment occurs; and • Presence of exotic invasive species as well as bush encroachment species is effectively controlled.	• Re-vegetate poorly established rehabilitated areas; • Re-seed bare patches, as required; and • Apply additional fertiliser and/or organic matter, depending on the condition of the vegetation and the initial organic material application.
		○ Species present and abundance; ○ Estimates of average plant basal cover, vegetation canopy and ground cover heights;			

COMPONENT / ASPECT		MONITORING		PERFORMANCE/SUCCESS CRITERIA	CORRECTIVE ACTION
		METHODOLOGY	FREQUENCY/DURATION		
		○ Distribution, densities, growth, and survival of woody species; ○ Dominant plant species (woody and herbaceous); ○ Presence of exotic invasive species; and ○ Occurrence of erosion, noting aspects such as type, severity, degree of sediment build-up.			
	Alien Invasive species	• Visually inspect areas where invasive species have been previously eradicated and areas prone to invasive species (e.g., eroded/degraded areas, along drainage lines, etc.); and • Undertake surveys on relevant sites where bush encroachment has previously been identified, to determine the status quo of invasive vegetation.	• Annually during the operational period.	• Category 1, 2 and 3 invader species brought under control and/or prevented; • Extended threat to ecosystems, habitats or locally occurring species is minimised; and • Increased potential for natural systems to deliver goods and services is maintained.	• Revisit mitigation measures and adjust as required; and • Ensure ongoing control and management program in place.

COMPONENT / ASPECT		MONITORING		PERFORMANCE/SUCCESS CRITERIA	CORRECTIVE ACTION
		METHODOLOGY	FREQUENCY/DURATION		
OTHER: AIR QUALITY & TOPOGRAPHY	Air Quality	• Undertake monthly dust monitoring programme according to ASTM International standard method	• Monthly	• As required by ASTM International standard	• Review success of rehabilitation techniques • Adjust/improve accordingly.
	Topography and erosion	• Conduct a visual assessment to determine areas of potential erosion; • Identify incidences of rill and gully erosion and/or excessive siltation in a specific area; and • Rehabilitate impacted areas in terms of at least progressive in-filling of voids, shaping, top soiling and grassing.	• Monthly during the operational period.	• Concurrent surface rehabilitation that is aligned to rehabilitation planning; • Implemented landform is aligned to designed landform; and • Self-sustaining vegetation establishment occurs.	• Adjust earthworks and construction practices to achieve and maintain the desired slopes; • Improve vegetation coverage where erosion occurs; • Install energy dissipation measures if improved vegetation is not sufficient/achieved; • At excessive slope lengths and signs of sheet erosion, construct contour drainage berms that intercept the overland

COMPONENT / ASPECT		MONITORING		PERFORMANCE/SUCCESS CRITERIA	CORRECTIVE ACTION
		METHODOLOGY	FREQUENCY/DURATION		flow; and • In areas of runoff concentration, create dedicated surface runoff pathways that are appropriately vegetated.

12.2. MONITORING AND MANAGEMENT OF IMPACTS

No additional monitoring requirements form part of this document, as it has already been covered in the previous EMPs. For future updates of this closure plan, the updated EMP with accompanying management plans for the entire site (including the proposed expansion project) should be considered and any additional requirements must be considered.

12.3. PROPOSED POST-CLOSURE MONITORING AND PROGRAMMES

The objective of monitoring programmes is to assess to what extent the closure criteria is being achieved during rehabilitation and closure and to identify corrective actions in situations where the closure criteria is not being achieved or the progress towards achievement is not satisfactory. These programmes are thus directly aligned with the criteria. The programmes shall comprise the following and it is the responsibility of a suitably qualified and experienced person to ensure that these requirements are adhered to:

- Ensure that relevant financial resources are made available;
- Documented procedures are in place which provide step by step instructions on how monitoring should be undertaken;
- Appoint appropriately qualified specialists to undertake the monitoring in a timeous manner to ensure work can be carried out to acceptable standards;
- Make use of appropriately calibrated equipment and where samples require analysis, they shall be preserved according to laboratory specifications;
- Make use of an independent and accredited laboratory to analyse samples and/or internal laboratory results shall periodically be checked by independent and accredited laboratories;
- Interpret monitoring data and trends of the data, and communicate to all relevant internal and external stakeholders, taking into consideration requirements of any licences; and
- Maintain monitoring records for at least 50 years post monitoring events.

13. CONCLUSION

Regulations Reference: (m)(i)	• This Section includes the motivations for any amendments made to the final rehabilitation, decommissioning and mine closure plan, given the monitoring results in the previous auditing period and the identification of gaps, where applicable.

Refining the closure planning process for Mokala Manganese is an on-going process and therefore the Rehabilitation, Decommissioning and Mine Closure Plan should be seen as a working document which is based on the best, and most recent available information. It is important to note that any deviation from the current Rehabilitation and Closure criteria, which is used for costing purposes, may have a significant impact on future liability estimates.

The Mokala Manganese Mine Rehabilitation, Decommissioning and Mine Closure Plan and all its supporting documentation (Appendices) are the product of a dynamic approach and should therefore be reviewed regularly to ensure that all aspects and associated costs are taken into consideration. Furthermore, it is important that all the information be incorporated into all mining strategies, planning and operational processes. This will ensure that the objectives set out within the plan are reached and will also provide potential opportunities to reduce closure costs.

Notwithstanding the assumptions made and certain gaps that remain, if the closure measures are implemented as envisaged, the reflected costs provide a good indication of the closure liability estimates and should provide a good basis for making the required financial provision. The biophysical and physical closure costs calculated are applicable to closure situations as well as concurrent rehabilitation during the operational phase (if and when applicable).

Gaps and Way Forward:

For future updates of the closure plan for Mokala Mine as a whole, the following gaps need to be addressed:

- For future updates of the rehabilitation and closure planning documents, Appendix 3 and Appendix 5, should be undertaken as per the GNR 1147 regulation as stated in the Financial Provisioning Regulations, 2015 published under Government Notice No. R 1147 of 20 November 2015. This means that an Annual Rehabilitation plan

(Appendix 3) as well as a Latent and Residual Risk assessment (Appendix 5) should be compiled and should take the entire site into consideration.

- This Rehabilitation, Decommissioning and Mine Closure Plan document (which is Appendix 4 as per the GNR 1147 regulation), should also be updated with a site-wide approach.
- Rehabilitation and Closure criteria need to be refined and confirmed for the entire site, through onsite-learnings and implementation of trial sites.
- In terms of monitoring, post-closure monitoring points need to be confirmed and included in the next update of the closure plan for the entire site.
- Timeframes for monitoring and reporting need to be formulated and defined.
- Final site performance criteria need to be clearly formulated and defined to ensure outcomes are measurable.

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APPENDICES TO BE REFERENCED

APPENDIX A1: MINE SITE LAYOUT PLAN & COSTING REFERENCE MAP

APPENDIX B2: POST-MINING LAND USE

APPENDIX C: CLOSURE RISK ASSESSMENT

APPENDIX D: CLOSURE CONSULTATION: WORKSHOP ATTENDANCE REGISTER

APPENDIX E: CLOSURE COST ESTIMATION

DOCUMENT SIGN-OFF

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NAME AND SURNAME	**NAME AND SURNAME**
DESIGNATION	**DESIGNATION**
[INSERT SIGNATURE]	[INSERT SIGNATURE]
NAME AND SURNAME	**NAME AND SURNAME**
DESIGNATION	**DESIGNATION**

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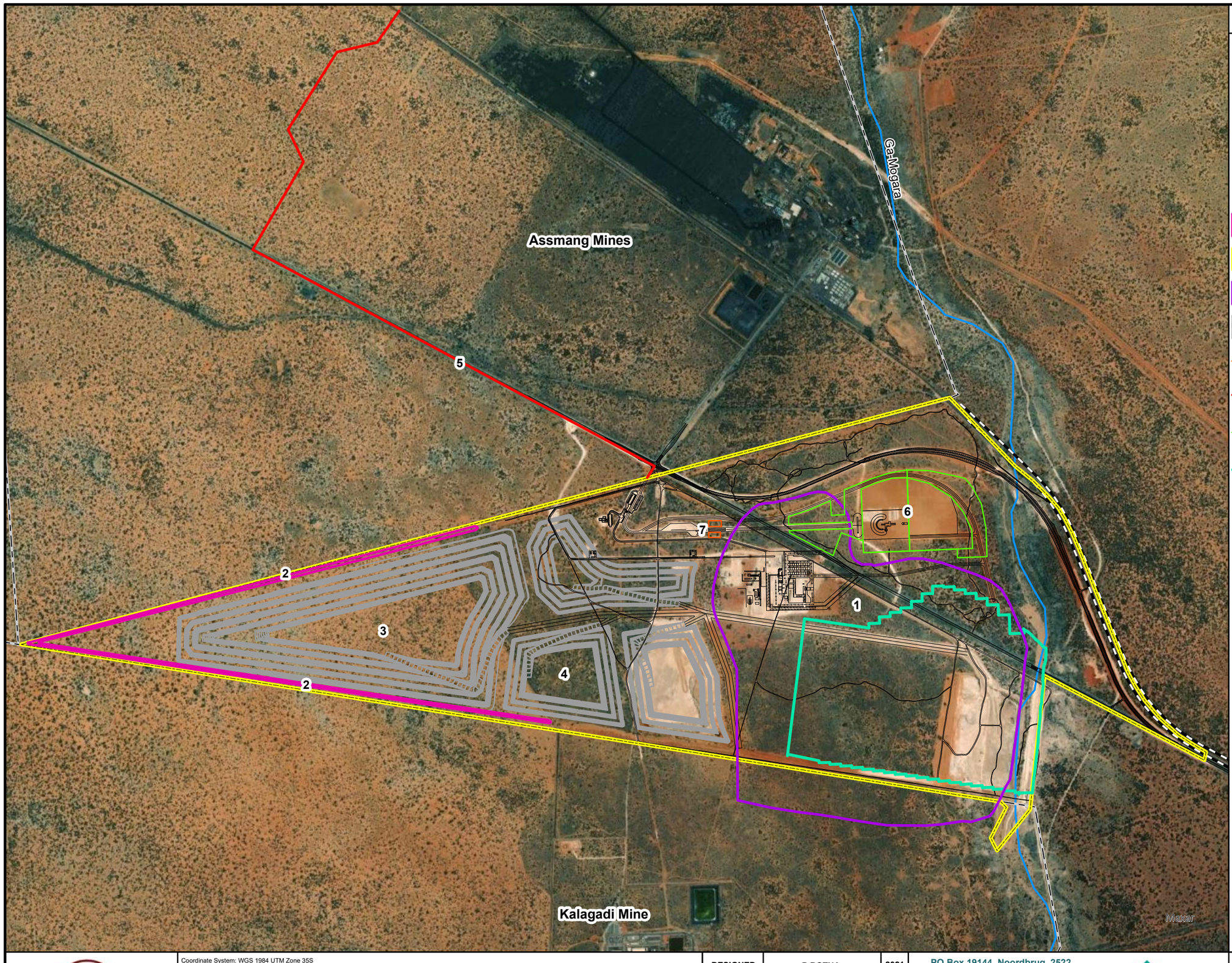

LEGEND

Reference Numbers:

1 - Proposed Open Pit Expansion Area
2 - Proposed Topsoil Stockpiles
3 - New Waste Rock Dump
4 - Waste Rock Dump Extension
5 - Planned Water Supply Pipeline
6 - Proposed ROM & Product Stockpile Expansion
7 - Top Up Stockpiles

- Proposed Topsoil Stockpiles
- Project Area
- Proposed Open Pit Expansion Area
- Portions
- Top Up Stockpiles
- Planned Sedibeng Pipeline
- Proposed ROM & Product Stockpile Expansion
- Current Open Pit Area
- Rivers

MOKALA MANGANESE MINE

Coordinate System: WGS 1984 UTM Zone 35S
Projection: Transverse Mercator
Datum: WGS 1984
False Easting: 500,000.0000
False Northing: 10,000,000.0000
Central Meridian: 27.0000
Scale Factor: 0.9996
Latitude Of Origin: 0.0000
Units: Meter
Date: 21/01/2022

0 0.15 0.3 0.6 0.9 1.2 km

N

DESIGNED	P BOTHA	2021
DRAWN	P BOTHA	2021
CHECKED	LM KOEKEMOER	2021
	NAME	DATE

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E-TEK CONSULTING

CONTRACT : MOKALA MANGANESE
PROJECT DESCRIPTION : EIA - FINANCIAL PROVISION FY2021
PROJECT NO : PN100467

DRAWING NO : 01 - REFERENCE MAP

-10000

N

R380

Ga-Mogara

EAST 270

MUKULU 265

GLORIA 266

KLIPLING 271

UMTU 281

OLIVE PAN 282

HOTAZEL 280

Proposed Potable Pipeline

Existing Intersection to Gloria Mine

Administration Block

Topup Stockpile

Supplementary Product Stockpile

Plant Area & High Grade & ROM Product Stockpiles

Truck Loading & Staging Facility

Weigh Bridge

Security Office & Carpark

Main Offices

Internal Haul Road

Proposed New Waste Rock Dump

Low Grade Stockpile

Contractor's Workshop & Hardpark Area

Open Pit Area

Proposed Topsoil Stockpiles

Proposed Expansion of Waste Rock Dump

Relocated Waste Rock Dump

Rapid Reloading Area

Barrier Pillar between Kalagadi and Mokala Mine

-3010000

-10000

Legend

- Mining Right Boundary
- Project Area
- Layout Changes
- Proposed Open Pit Expansion Area
- Proposed Potable Pipeline
- Rivers
- 100m River Buffer
- 100yr Floodline
- 50yr Floodline
- Powerlines
- Railway
- Farm Boundaries
- Historical Borrow Pits
- Area Fenced Off By Kalagadi for Game
- Grazing

0 200 400 Meters

Scale: 1:18 8000 @ A3

Projection:Transverse Mercator
Datum: Hartebeeshoek, Lo 23

MOKALA MANGANESE (PTY) LTD

Post Mining Land Use

SLR Consulting (Africa) (Pty) Ltd
P O Box 1596, Cramerview, 2060, South Africa
Tel: +27 (11) 467-0945 Fax: +27 (11) 467-0978

710.0912.00001

RISK RATING MATRIX	CONSEQUENCE				
	1	2	3	4	5
	INSIGNIFICANT	MINOR	MODERATE	HIGH	MAJOR
Safety	First aid case	Medical treatment case	Lost time injury	Permanent disability or single fatality	Numerous permanent disabilities or multiple fatalities
Occupational Health	Exposure to health hazard resulting in temporary discomfort	Exposure to health hazard resulting in symptoms requiring medical intervention and full recovery (no loss time)	Exposure to health hazards/ agents (over the OEL) resulting in reversible impact on health (with lost time) or permanent change with no disability or loss of quality of life	Exposure to health hazards/ agents (significantly over the OEL) resulting in irreversible impact on health with loss of quality of life or single fatality	Exposure to health hazards/ agents (significantly over the OEL) resulting in irreversible impact on health with loss of quality of life of a numerous group/ population or multiple fatalities
Environment	Lasting days or less; limited to small area (metres); receptor of low significance/ sensitivity (industrial area)	Lasting weeks; reduced area (hundreds of metres); no environmentally sensitive species/ habitat)	Lasting months; impact on an extended area (kilometres); area with some environmental sensitivity (scarce/ valuable environment).	Lasting years; impact on sub-basin; environmentally sensitive environment/ receptor (endangered species/ habitats)	Permanent impact; affects a whole basin or region; highly sensitive environment (endangered species, wetlands, protected habitats)
Financial	No disruption to operation/ Less than 1% of current liability estimate	Brief disruption to operation/ 1% to less than 3% of current liability estimate	Partial shutdown of operation / 3% to less than 10% of current liability estimate	Partial loss of operation / 10% to less than 30% of current liability estimate	Substantial or total loss of operation / 30% or higher of current liability estimate
Legal & Regulatory	Technical non-compliance. No warning received; no regulatory reporting required	Breach of regulatory requirements; report/involvement of authority. Attracts administrative fine	Minor breach of law; report/investigation by authority. Attracts compensation/ penalties/ enforcement action	Breach of the law; may attract criminal prosecution, penalties/ enforcement action. Individual licence temporarily revoked	Significant breach of the law. Individual or company law suits; permit to operate substantially modified or withdrawn
Social / Community	Minor disturbance of culture/ social structures	Some impacts on local population, mostly repairable. Single stakeholder complaint in reporting period	On going social issues. Isolated complaints from community members/ stakeholders	Significant social impacts. Organized community protests threatening continuity of operations	Major widespread social impacts. Community reaction affecting business continuity. “License to operate” under jeopardy
Reputation	Minor impact; awareness/ concern from specific individuals	Limited impact; concern/ complaints from certain groups/ organizations (e.g. NGOs)	Local impact; public concern/ adverse publicity localised within neighbouring communities	Suspected reputational damage; local/ regional public concern and reactions	Noticeable reputational damage; national/ international public attention and repercussions

PROBABILITY / LIKELIHOOD			RISK RATING				
ALMOST CERTAIN 1yr	5	The unwanted event has occurred frequently: occurs in order of one or more times per year & is likely to reoccur within 1 year	11 (M)	16 (S)	20 (S)	23 (H)	25 (H)
LIKELY 3 yrs	4	The unwanted event has occurred infrequently; occurs in order of less than once per year & is likely to reoccur within 3 years	7 (M)	12 (M)	17 (S)	21 (H)	24 (H)
POSSIBLE 10 yrs	3	The unwanted event has happened at some time; or could happen within 10 years	4 (L)	8 (M)	13 (S)	18 (S)	22 (H)
UNLIKELY 30yrs	2	The unwanted event has happened at some time; or could happen within 30 years	2 (L)	5 (L)	9 (M)	14 (S)	19 (S)
RARE >30 yrs	1	The unwanted event has never been known to occur; or it is highly unlikely that it will occur within 30 years	1 (L)	3 (L)	6 (M)	10 (M)	15 (S)

Risk Rating	Risk Level	GUIDELINES FOR RISK MATRIX
21 to 25	H - High	A high risk exists that management’s objectives may not be achieved. Appropriate mitigation strategy to be devised immediately.
13 to 20	S - Significant	A significant risk exists that management’s objectives may not be achieved. Appropriate mitigation strategy to be devised as soon as possible.
6 to 12	M - Medium	A moderate risk exists that management’s objectives may not be achieved. Appropriate mitigation strategy to be devised as part of the normal management process.
1 to 5	L - Low	A low risk exists that management’s objectives may not be achieved. Monitor risk, no further mitigation required.

MOKALA MANGANESE MINE CLOSURE RISKS FOR EXPANSION PROJECTS				BEFORE / PRE-MITIGATION																								CONTROLS / MITIGATION MEASURES [REHABILITATION & CLOSURE CRITERIA]	POST-MITIGATION RISKS																									
				SAFETY			OCCUPATIONAL HEALTH			ENVIRON-MENTAL			FINANCIAL			LEGAL & REGULATORY			SOCIAL / COMMUNITY			REPUTATION				SAFETY			OCCUPATIONAL HEALTH			ENVIRON-MENTAL			FINANCIAL			LEGAL & REGULATORY			SOCIAL / COMMUNITY			REPUTATION		
CLOSURE COMPONENTS	NOTES		ASSOCIATED ACTIVITY / RISKS	Probability	Consequence	Ranking	Probability	Consequence	Ranking	Probability	Consequence	Ranking	Probability	Consequence	Ranking	Probability	Consequence	Ranking	Probability	Consequence	Ranking	Probability	Consequence	Ranking		Probability	Consequence	Ranking	Probability	Consequence	Ranking	Probability	Consequence	Ranking	Probability	Consequence	Ranking	Probability	Consequence	Ranking	Probability	Consequence	Ranking	Probability	Consequence	Ranking	Probability	Consequence	Ranking	
OPENCAST AREAS	Uncontrolled access	i	Injury or death of humans and their animals due to uncontrolled access to the opencast pit area (falling into the pit from the pit rim or ramps, collapse of the highwalls or ramps).	4	4	21 (H)	4	4	21 (H)			#N/A	3	3	13 (S)	3	3	13 (S)	4	4	21 (H)	4	3	17 (S)	• Backfill opencast voids with material from the local waste rock dump. • Shape and level backfilled area leaving area free draining with stormwater management structures. • Place 400m thick layer of topsoil on backfilled surface. • Establish vegetation which includes soil amelioration and cultivation actions.	1	2	3 (L)	1	2	3 (L)			#N/A	1	1	1 (L)	1	1	1 (L)	1	2	3 (L)	1	1	1 (L)
	Physical slope stability & Post-mining Land use	ii	Failure of the open pit side walls and ramps, results in long term instability of areas surrounding the pit, thereby compromising the planned final land use.	4	4	21 (H)	4	4	21 (H)	4	4	21 (H)	4	3	17 (S)	3	3	13 (S)	4	4	21 (H)	4	4	21 (H)		1	1	1 (L)	1	2	3 (L)	1	2	3 (L)	1	2	3 (L)	1	1	1 (L)	1	2	3 (L)	1	2	3 (L)
	Post-mining Land use	iii	Risk of compromising end land use and capability of areas that were backfilled (human interference / overgrazing)			#N/A			#N/A	4	4	21 (H)	4	2	12 (M)	4	3	17 (S)	4	4	21 (H)	4	4	21 (H)	• No additional closure criteria - only monitoring to achieve land use of grazing. • Ongoing monitoring and maintenance with the aim of the area becoming self-sustainable.			#N/A			#N/A	2	2	5 (L)	2	1	2 (L)	2	1	2 (L)	1	2	3 (L)	1	2	3 (L)
		iv	Potential for surface subsidence (uneven settling)	4	4	21 (H)			#N/A	4	3	17 (S)	3	2	8 (M)	3	3	13 (S)	4	3	17 (S)	3	3	13 (S)	• Backfill opencast voids with material from the local waste rock dump (whaleback to allow for settlement). • Shape and level backfilled area leaving area free draining with stormwater management structures.	1	2	3 (L)			#N/A	1	2	3 (L)	1	1	1 (L)	2	2	5 (L)	2	2	5 (L)	2	2	5 (L)
	Barrier Pillar	v	No commercial agreement in place yet for the barrier pillar falling outside of the Mokala mining right area			#N/A			#N/A			#N/A	3	2	8 (M)	3	4	18 (S)			#N/A	3	3	13 (S)	• Ensure that the commercial agreement is in place through engagement and consultations with Kalagadi Mine.			#N/A			#N/A			#N/A	1	1	1 (L)	1	1	1 (L)			#N/A	1	1	1 (L)
WASTE ROCK DUMPS	Physical slope stability	i	Safety and stability of side slopes associated with side slope slips and failures.	4	3	17 (S)	4	2	12 (M)	4	3	17 (S)	4	2	12 (M)	3	3	13 (S)	4	3	17 (S)	5	3	20 (S)	• Assumed remaining waste rock dump has been reshaped down to 18 degrees as material is utilised for backfilling of the pit. • Place 400mm thick layer of topsoil over profiled waste rock dump. • Rip on contour 500mm deep. • Establish vegetation which includes soil amelioration and cultivation actions.	1	2	3 (L)	1	1	1 (L)	2	2	5 (L)	3	1	4 (L)	2	2	5 (L)	2	2	5 (L)	2	2	5 (L)
	Uncontrolled access	ii	Human injury or death due to sliding or falling down unrehabilitated steep slopes.	4	4	21 (H)	4	4	21 (H)			#N/A	3	3	13 (S)	3	3	13 (S)	4	3	17 (S)	4	3	17 (S)		2	3	9 (M)	2	3	9 (M)			#N/A	2	2	5 (L)	1	2	3 (L)	2	2	5 (L)	2	2	5 (L)
	Post-mining Land use	iii	Vegetation establishment on the current dump slopes not sustainable and thereby compromising the post-mining land use.			#N/A			#N/A	4	3	17 (S)	3	2	8 (M)	3	2	8 (M)	4	3	17 (S)	4	3	17 (S)				#N/A			#N/A	2	2	5 (L)	2	1	2 (L)	2	1	2 (L)	2	2	5 (L)	2	2	5 (L)
	Surface and groundwater	iv	Adverse groundwater and surface water quality effects due to contaminated runoff or seepage from WRD slopes.			#N/A	4	3	17 (S)	5	3	20 (S)	4	2	12 (M)	4	3	17 (S)	4	4	21 (H)	4	4	21 (H)				#N/A	2	2	5 (L)	2	2	5 (L)	2	1	2 (L)	2	2	5 (L)	2	2	5 (L)	2	2	5 (L)
	Aesthetic value of the landscape	v	Visual impact / aesthetically not aligned to the adjacent landscape character and land use.			#N/A			#N/A			#N/A	3	2	8 (M)			#N/A	4	4	21 (H)	4	3	17 (S)				#N/A			#N/A			#N/A	1	1	1 (L)			#N/A	2	3	9 (M)	2	2	5 (L)
	Air Quality	vi	Dust fallout (quantity) from rehabilitated areas resulting in nuisance and/or health effects to surrounding landowners/communities.	4	3	17 (S)	4	4	21 (H)	3	2	8 (M)	3	2	8 (M)	4	2	12 (M)	4	3	17 (S)	4	3	17 (S)		2	2	5 (L)	2	2	5 (L)	2	1	2 (L)	2	1	2 (L)	2	1	2 (L)	2	2	5 (L)	2	2	5 (L)
TOPSOIL DUMPS	Soil as a resource to re-establishing post-closure land capability.	i	Topsoil loss due to mismanagement			#N/A			#N/A	4	3	17 (S)	4	2	12 (M)	3	2	8 (M)			#N/A	3	3	13 (S)	• Implementation of soil management procedures, control guideline and rehabilitation procedures throughout operational phase.			#N/A			#N/A	2	2	5 (L)	1	1	1 (L)	1	1	1 (L)			#N/A	2	2	5 (L)
		ii	Insufficient rehabilitation of topsoil dumps resulting in potential ponding and negatively affecting next land use			#N/A			#N/A	4	3	17 (S)	3	2	8 (M)	3	2	8 (M)	4	3	17 (S)	4	3	17 (S)	• Assumed footprint will be left shaped and levelled as material is removed. • Rip footprint area 500mm deep to alleviate any compaction. • Establish vegetation which includes soil amelioration and cultivation actions			#N/A			#N/A	2	2	5 (L)	2	1	2 (L)	2	1	2 (L)	2	2	5 (L)	1	2	3 (L)
RUN OF MINE (ROM) AND PRODUCT FOOTPRINT	Assumption that RoM stockpiles will be reprocessed at closure, only footprint rehabilitation to remain.	i	Deterioration of vegetation on rehabilitated areas due to incorrect plant species selection.			#N/A			#N/A	3	2	8 (M)	3	2	8 (M)	3	3	13 (S)	3	2	8 (M)	3	2	8 (M)	• Ameliorate growth medium based on soil analysis. • Indigenous species adapted to the site to be used (harvesting to be done in the surrounding area of the mine or equivalent species purchased/sourced).			#N/A			#N/A	2	1	2 (L)	2	1	2 (L)	2	3	9 (M)	2	1	2 (L)	2	1	2 (L)
TOP-UP STOCKPILE AREAS (AT WEIGHBRIDGE)	Assumption that RoM stockpiles will be reprocessed at closure, only footprint rehabilitation to remain.	i	Deterioration of vegetation on rehabilitated areas due to incorrect plant species selection.			#N/A			#N/A	3	1	4 (L)	3	1	4 (L)	3	3	13 (S)	3	2	8 (M)	3	2	8 (M)	• Ameliorate growth medium based on soil analysis. • Indigenous species adapted to the site to be used (harvesting to be done in the surrounding area of the mine or equivalent species purchased/sourced).			#N/A			#N/A	2	1	2 (L)	2	1	2 (L)	2	3	9 (M)	2	1	2 (L)	2	1	2 (L)
LINEAR INFRASTRUCTURE (PIPELINE)	Underground pipeline.	i	Possibility of pipeline becoming derelict and not having a post closure use - falling in a state of disrepair and having safety implications.	3	2	8 (M)			#N/A			#N/A	3	1	4 (L)	3	2	8 (M)	3	2	8 (M)	3	1	4 (L)	• Remove exposed pipeline valves and connection points. • Remaining infrastructure (pipeline) underground will be left post-closure.	2	2	5 (L)			#N/A			#N/A	2	1	2 (L)	2	2	5 (L)	2	2	5 (L)	2	1	2 (L)
MONITORING AND MAINTENANCE		i	Insufficient monitoring and maintenance techniques and therefore not achieving planned final post-closure use.			#N/A			#N/A			#N/A	3	2	8 (M)	3	3	13 (S)	3	2	8 (M)	3	2	8 (M)	• Refining of monitoring and maintenance techniques during the operational phase. • Post-closure period of 5 years to conduct care and maintenance of rehabilitated areas			#N/A			#N/A			#N/A	2	1	2 (L)	2	3	9 (M)	2	2	5 (L)	2	2	5 (L)

ATTENDANCE REGISTER

Workshop: Closure Criteria Workshop
Venue: Mokala Mine
Date: 18 June 2021

Name	Company	E-mail Address	Contact Number	Signature
LEON KOEKEMOER	E-TEK	lkoekemoer@etekconsulting.co.za	076 730 3983	
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MOKALA MANGANESE MINE

E-TEK CONSULTING

Mokala Manganese Mine

EIA - Financial Provision FY2021

MOKALA MANGANESE MINE EIA - FINANCIAL PROVISION SUMMARY												
ESTIMATED CLOSURE COST ESTIMATES (INCLUDES P&G'S, CONTINGENCIES AND VAT AND EXCLUDES ESCALATION)			Premature Closure	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast
CLOSURE COMPONENTS			2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
1	**INFRASTRUCTURAL ASPECTS**		**R 100 000,00**	**R 100 000,00**	**R 100 000,00**	**R 100 000,00**	**R 100 000,00**	**R 100 000,00**	**R 100 000,00**	**R 100 000,00**	**R 100 000,00**	**R 100 000,00**
1,1	PLANT AND RELATED STRUCTURES		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
1,2	SHAFTS, ADITS AND DECLINES		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
1,3	SUPPORTING INFRASTRUCTURE		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
1,4	UNDERGROUND INFRASTRUCTURE		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
1,5	SOCIAL INFRASTRUCTURE		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
1,6	OFF-SITE INFRASTRUCTURE		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
1,7	LINEAR ITEMS		R 100 000,00	R 100 000,00	R 100 000,00	R 100 000,00	R 100 000,00	R 100 000,00	R 100 000,00	R 100 000,00	R 100 000,00	R 100 000,00
1,8	WASTE DISPOSAL		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
1,9	RIVER DIVERSION		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
2	**MINING ASPECTS**		**-R 4 276 594,86**	**R 78 349 695,28**	**R 82 308 766,10**	**R 97 251 138,82**	**R 101 235 166,53**	**R 103 522 125,49**	**R 102 296 968,90**	**R 103 429 104,34**	**R 104 874 335,35**	**R 103 084 245,45**
2,1	OPENCAST / PIT AREAS		-R 7 584 407,03	R 75 041 883,12	R 79 000 953,93	R 93 943 326,65	R 97 927 354,36	R 100 214 313,32	R 98 989 156,73	R 100 121 292,17	R 101 566 523,18	R 99 776 433,28
2,2	WASTE ROCK DUMPS - OVERBURDEN AND SPOILS		R 3 307 812,17	R 3 307 812,17	R 3 307 812,17	R 3 307 812,17	R 3 307 812,17	R 3 307 812,17	R 3 307 812,17	R 3 307 812,17	R 3 307 812,17	R 3 307 812,17
2,3	COARSE RESIDUE DEPOSITS - PROCESSING WASTE		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
2,4	FINE RESIDUE DEPOSITS - PROCESSING WASTE		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
3	**BIO-PHYSICAL CLOSURE ASPECTS**		**R -**	**R -**	**R -**	**R -**	**R -**	**R -**	**R -**	**R -**	**R -**	**R -**
3,1	WATER RESOURCES		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
3,2	SENSITIVE HABITATS & BIODIVERSITY		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
3,3	LAND USE & LAND CAPABILITY		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
3,4	SOIL		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
3,5	OTHER: AIR QUALITY & TOPOGRAPHY		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
4	**SOCIAL CLOSURE ASPECTS**		**R -**	**R -**	**R -**	**R -**	**R -**	**R -**	**R -**	**R -**	**R -**	**R -**
4,1	EMPLOYEES		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
4,2	INTERESTED AND AFFECTED PARTIES		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
4,3	GOVERNMENT		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
5	**GENERAL ASPECTS**		**R 3 441 529,25**	**R 3 431 847,96**	**R 3 572 630,03**	**R 4 103 971,38**	**R 4 245 640,90**	**R 4 326 963,72**	**R 4 283 397,92**	**R 4 323 655,94**	**R 4 375 047,45**	**R 4 311 392,98**
5,1	GENERAL SURFACES		R 2 543 535,65	R 2 543 535,65	R 2 543 535,65	R 2 543 535,65	R 2 543 535,65	R 2 543 535,65	R 2 543 535,65	R 2 543 535,65	R 2 543 535,65	R 2 543 535,65
5,2	POST CLOSURE MONITORING AND MAINTENANCE		R 897 993,60	R 888 312,31	R 1 029 094,37	R 1 560 435,73	R 1 702 105,25	R 1 783 428,06	R 1 739 862,27	R 1 780 120,29	R 1 831 511,80	R 1 767 857,33
5,3	SPECIALIST STUDIES		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
	SUB-TOTAL 1		**-R 735 065,61**	**R 81 881 543,25**	**R 85 981 396,13**	**R 101 455 110,20**	**R 105 580 807,43**	**R 107 949 089,20**	**R 106 680 366,82**	**R 107 852 760,28**	**R 109 349 382,79**	**R 107 495 638,43**
	Weighted Preliminary and General	6%	-R 44 103,94	R 4 912 892,59	R 5 158 883,77	R 6 087 306,61	R 6 334 848,45	R 6 476 945,35	R 6 400 822,01	R 6 471 165,62	R 6 560 962,97	R 6 449 738,31
	Weighted Contingencies	10%	-R 73 506,56	R 8 188 154,32	R 8 598 139,61	R 10 145 511,02	R 10 558 080,74	R 10 794 908,92	R 10 668 036,68	R 10 785 276,03	R 10 934 938,28	R 10 749 563,84
	SUB-TOTAL 2 FOR P&G's AND CONTINGENCIES		**-R 117 610,50**	**R 13 101 046,92**	**R 13 757 023,38**	**R 16 232 817,63**	**R 16 892 929,19**	**R 17 271 854,27**	**R 17 068 858,69**	**R 17 256 441,65**	**R 17 495 901,25**	**R 17 199 302,15**
	SUB-TOTAL 3		**-R 852 676,10**	**R 94 982 590,17**	**R 99 738 419,51**	**R 117 687 927,83**	**R 122 473 736,61**	**R 125 220 943,48**	**R 123 749 225,51**	**R 125 109 201,93**	**R 126 845 284,04**	**R 124 694 940,58**
	VAT	15%	-R 127 901,42	R 14 247 388,53	R 14 960 762,93	R 17 653 189,18	R 18 371 060,49	R 18 783 141,52	R 18 562 383,83	R 18 766 380,29	R 19 026 792,61	R 18 704 241,09
	GRAND-TOTAL		**-R 980 577,52**	**R 109 229 978,69**	**R 114 699 182,43**	**R 135 341 117,01**	**R 140 844 797,11**	**R 144 004 085,00**	**R 142 311 609,34**	**R 143 875 582,22**	**R 145 872 076,65**	**R 143 399 181,66**

Mokala Manganese Mine

EIA - Financial Provision FY2021

MOKALA MANGANESE MINE P&G's FOR FINANCIAL PROVISION						
ESTIMATED CLOSURE COST ESTIMATES (EXCLUDES CONTINGENCIES, ESCALATION AND INCLUDES P&G's)		CLOSURE PLAN EXL P&G's	P&G's ALLOWANCE	P&G's PER CATEGORY		CLOSURE PLAN INCL P&G's
CLOSURE COMPONENT						
1	**INFRASTRUCTURAL ASPECTS**	**R 100 000,00**	**6%**	**R 6 000,00**		**R 106 000,00**
1,1	PLANT AND RELATED STRUCTURES	R -	6%	R -		R -
1,2	SHAFTS, ADITS AND DECLINES	R -	0%	R -		R -
1,3	SUPPORTING INFRASTRUCTURE	R -	6%	R -		R -
1,4	UNDERGROUND INFRASTRUCTURE	R -	0%	R -		R -
1,5	SOCIAL INFRASTRUCTURE	R -	0%	R -		R -
1,6	OFF-SITE INFRASTRUCTURE	R -	0%	R -		R -
1,7	LINEAR ITEMS	R 100 000,00	6%	R 6 000,00		R 106 000,00
1,8	WASTE DISPOSAL	R -	6%	R -		R -
1,9	RIVER DIVERSION	R -	0%	R -		R -
2	**MINING ASPECTS**	**-R 4 276 594,86**	**6%**	**-R 256 595,69**		**-R 4 533 190,55**
2,1	OPENCAST / PIT AREAS	-R 7 584 407,03	6%	-R 455 064,42		-R 8 039 471,45
2,2	WASTE ROCK DUMPS - OVERBURDEN AND SPOILS	R 3 307 812,17	6%	R 198 468,73		R 3 506 280,90
2,3	COARSE RESIDUE DEPOSITS - PROCESSING WASTE	R -	6%	R -		R -
2,4	FINE RESIDUE DEPOSITS - PROCESSING WASTE	R -	6%	R -		R -
3	**BIO-PHYSICAL CLOSURE ASPECTS**	**R -**	**0%**	**R -**		**R -**
3,1	WATER RESOURCES	R -	0%	R -		R -
3,2	SENSITIVE HABITATS & BIODIVERSITY	R -	0%	R -		R -
3,3	LAND USE & LAND CAPABILITY	R -	0%	R -		R -
3,4	SOIL	R -	0%	R -		R -
3,5	OTHER: AIR QUALITY & TOPOGRAPHY	R -	0%	R -		R -
4	**SOCIAL CLOSURE ASPECTS**	**R -**	**0%**	**R -**		**R -**
4,1	EMPLOYEES	R -	0%	R -		R -
4,2	INTERESTED AND AFFECTED PARTIES	R -	0%	R -		R -
4,3	GOVERNMENT	R -	0%	R -		R -
5	**GENERAL ASPECTS**	**R 3 441 529,25**	**6%**	**R 206 491,76**		**R 3 648 021,01**
5,1	GENERAL SURFACES	R 2 543 535,65	6%	R 152 612,14		R 2 696 147,79
5,2	POST CLOSURE MONITORING AND MAINTENANCE	R 897 993,60	6%	R 53 879,62		R 951 873,22
5,3	SPECIALIST STUDIES	R -	0%	R -		R -
		Total excl P&G's	Weighted P&G's	Total P&G's		Grand Total for Closure Plan incl P&G's
		-R 735 065,61	**6%**	**-R 44 103,94**		**-R 779 169,54**

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MOKALA MANGANESE MINE CONTINGENCIES FOR FINANCIAL PROVISION						
ESTIMATED CLOSURE COST ESTIMATES (EXCLUDES CONTINGENCIES, ESCALATION AND INCLUDES P&G's)		CLOSURE PLAN EXL CONTINGENCIES	CONTINGENCY ALLOWANCE	CONTINGENCIES PER CATEGORY		CLOSURE PLAN INCL CONTINGENCIES
CLOSURE COMPONENT						
1	**INFRASTRUCTURAL ASPECTS**	**R 100 000,00**	**10%**	**R 10 000,00**		**R 110 000,00**
1,1	PLANT AND RELATED STRUCTURES	R -	10%	R -		R -
1,2	SHAFTS, ADITS AND DECLINES	R -	0%	R -		R -
1,3	SUPPORTING INFRASTRUCTURE	R -	10%	R -		R -
1,4	UNDERGROUND INFRASTRUCTURE	R -	0%	R -		R -
1,5	SOCIAL INFRASTRUCTURE	R -	0%	R -		R -
1,6	OFF-SITE INFRASTRUCTURE	R -	0%	R -		R -
1,7	LINEAR ITEMS	R 100 000,00	10%	R 10 000,00		R 110 000,00
1,8	WASTE DISPOSAL	R -	10%	R -		R -
1,9	RIVER DIVERSION	R -	0%	R -		R -
2	**MINING ASPECTS**	**-R 4 276 594,86**	**10%**	**-R 427 659,49**		**-R 4 704 254,34**
2,1	OPENCAST / PIT AREAS	-R 7 584 407,03	10%	-R 758 440,70		-R 8 342 847,73
2,2	WASTE ROCK DUMPS - OVERBURDEN AND SPOILS	R 3 307 812,17	10%	R 330 781,22		R 3 638 593,38
2,3	COARSE RESIDUE DEPOSITS - PROCESSING WASTE	R -	10%	R -		R -
2,4	FINE RESIDUE DEPOSITS - PROCESSING WASTE	R -	10%	R -		R -
3	**BIO-PHYSICAL CLOSURE ASPECTS**	**R -**	**0%**	**R -**		**R -**
3,1	WATER RESOURCES	R -	0%	R -		R -
3,2	SENSITIVE HABITATS & BIODIVERSITY	R -	0%	R -		R -
3,3	LAND USE & LAND CAPABILITY	R -	0%	R -		R -
3,4	SOIL	R -	0%	R -		R -
3,5	OTHER: AIR QUALITY & TOPOGRAPHY	R -	0%	R -		R -
4	**SOCIAL CLOSURE ASPECTS**	**R -**	**0%**	**R -**		**R -**
4,1	EMPLOYEES	R -	0%	R -		R -
4,2	INTERESTED AND AFFECTED PARTIES	R -	0%	R -		R -
4,3	GOVERNMENT	R -	0%	R -		R -
5	**GENERAL ASPECTS**	**R 3 441 529,25**	**10%**	**R 344 152,93**		**R 3 785 682,18**
5,1	GENERAL SURFACES	R 2 543 535,65	10%	R 254 353,57		R 2 797 889,22
5,2	POST CLOSURE MONITORING AND MAINTENANCE	R 897 993,60	10%	R 89 799,36		R 987 792,96
5,3	SPECIALIST STUDIES	R -	0%	R -		R -
		Total excl P&G's	Weighted Contingencies	Total Contingencies		Grand Total for Closure Plan incl Contingencies
		-R 735 065,61	**10%**	**-R 73 506,56**		**-R 808 572,17**

Mokala Manganese Mine

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SUMMARY - INFRASTRUCTURAL ASPECTS												
1	INFRASTRUCTURAL CLOSURE COMPONENTS & CRITER		Premature Closure	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast
ID	COMPONENT		2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
1,1	PLANT AND RELATED STRUCTURES		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
1,2	SHAFTS, ADITS AND DECLINES		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
1,3	SUPPORTING INFRASTRUCTURE		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
1,4	UNDERGROUND INFRASTRUCTURE		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
1,5	SOCIAL INFRASTRUCTURE		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
1,6	OFF-SITE INFRASTRUCTURE		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
1,7	LINEAR ITEMS		R 100 000,00	R 100 000,00	R 100 000,00	R 100 000,00	R 100 000,00	R 100 000,00	R 100 000,00	R 100 000,00	R 100 000,00	R 100 000,00
1,8	WASTE DISPOSAL		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
1,9	RIVER DIVERSION		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
	SUB-TOTAL 1		**R 100 000,00**	**R 100 000,00**	**R 100 000,00**	**R 100 000,00**	**R 100 000,00**	**R 100 000,00**	**R 100 000,00**	**R 100 000,00**	**R 100 000,00**	**R 100 000,00**
	Preliminary and General	6%	R 6 000,00	R 6 000,00	R 6 000,00	R 6 000,00	R 6 000,00	R 6 000,00	R 6 000,00	R 6 000,00	R 6 000,00	R 6 000,00
	Contingencies	10%	R 10 000,00	R 10 000,00	R 10 000,00	R 10 000,00	R 10 000,00	R 10 000,00	R 10 000,00	R 10 000,00	R 10 000,00	R 10 000,00
	SUB-TOTAL 2 (P&G's AND CONTINGENCIES)		**R 16 000,00**	**R 16 000,00**	**R 16 000,00**	**R 16 000,00**	**R 16 000,00**	**R 16 000,00**	**R 16 000,00**	**R 16 000,00**	**R 16 000,00**	**R 16 000,00**
	GRAND-TOTAL		**R 116 000,00**	**R 116 000,00**	**R 116 000,00**	**R 116 000,00**	**R 116 000,00**	**R 116 000,00**	**R 116 000,00**	**R 116 000,00**	**R 116 000,00**	**R 116 000,00**

Mokala Manganese Mine

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INFRASTRUCTURAL ASPECTS							Premature Closure						2021	Year 1
1,7	LINEAR ITEMS													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1		5	2021	Proposed Water Pipeline										Pipeline to remain in-situ below ground after closure. Surface disturbance will be rehabilitated during the construction phase. Assumed disturbed area is 7.3ha.
2				Remove exposed pipeline valves and connection points	Sum		Yes	1,2	1,00	sum	R 100 000,00	R 100 000,00	R 100 000,00	
3				Remove pipeline	Overland HDPE pipelines on plinths (<200mm)		No	5.2.4	3650,00	m	R 17,07	R 62 305,50	R -	No allowance as pipeline is below ground level.
					SUB-TOTAL 1								**R 100 000,00**	
					Preliminaries and General	6%							R 6 000,00	
					Contingency	10%							R 10 000,00	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 16 000,00**	
					GRAND-TOTAL								**R 116 000,00**	

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INFRASTRUCTURAL ASPECTS							Closure Forecast						2022	Year 2
1,7	LINEAR ITEMS													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1		5	2021	Proposed Water Pipeline										Pipeline to remain in-situ below ground after closure. Surface disturbance will be rehabilitated during the construction phase. Assumed disturbed area is 7.3ha.
2				Remove exposed pipeline valves and connection points	Sum		Yes	1,2	1,00	sum	R 100 000,00	R 100 000,00	R 100 000,00	
3				Remove pipeline	Overland HDPE pipelines on plinths (<200mm)		No	5.2.4	3650,00	m	R 17,07	R 62 305,50	R -	No allowance as pipeline is below ground level.
					SUB-TOTAL 1								**R 100 000,00**	
					Preliminaries and General	6%							R 6 000,00	
					Contingency	10%							R 10 000,00	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 16 000,00**	
					GRAND-TOTAL								**R 116 000,00**	

Mokala Manganese Mine

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INFRASTRUCTURAL ASPECTS							Closure Forecast						2023	Year 3
1,7	LINEAR ITEMS													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1		5	2021	Proposed Water Pipeline										Pipeline to remain in-situ below ground after closure. Surface disturbance will be rehabilitated during the construction phase. Assumed disturbed area is 7.3ha.
2				Remove exposed pipeline valves and connection points	Sum		Yes	1,2	1,00	sum	R 100 000,00	R 100 000,00	R 100 000,00	
3				Remove pipeline	Overland HDPE pipelines on plinths (<200mm)		No	5.2.4	3650,00	m	R 17,07	R 62 305,50	R -	No allowance as pipeline is below ground level.
						SUB-TOTAL 1							**R 100 000,00**	
						Preliminaries and General	6%						R 6 000,00	
						Contingency	10%						R 10 000,00	
						SUB-TOTAL 2 (P&G's AND CONTINGENCIES)							**R 16 000,00**	
						GRAND-TOTAL							**R 116 000,00**	

Mokala Manganese Mine

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INFRASTRUCTURAL ASPECTS							Closure Forecast						2024	Year 4
1,7	LINEAR ITEMS													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1		5	2021	Proposed Water Pipeline										Pipeline to remain in-situ below ground after closure. Surface disturbance will be rehabilitated during the construction phase. Assumed disturbed area is 7.3ha.
2				Remove exposed pipeline valves and connection points	Sum		Yes	1,2	1,00	sum	R 100 000,00	R 100 000,00	R 100 000,00	
3				Remove pipeline	Overland HDPE pipelines on plinths (<200mm)		No	5.2.4	3650,00	m	R 17,07	R 62 305,50	R -	No allowance as pipeline is below ground level.
						SUB-TOTAL 1							**R 100 000,00**	
						Preliminaries and General	6%						R 6 000,00	
						Contingency	10%						R 10 000,00	
						SUB-TOTAL 2 (P&G's AND CONTINGENCIES)							**R 16 000,00**	
						GRAND-TOTAL							**R 116 000,00**	

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INFRASTRUCTURAL ASPECTS							Closure Forecast						2025	Year 5
1,7	LINEAR ITEMS													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1		5	2021	Proposed Water Pipeline										Pipeline to remain in-situ below ground after closure. Surface disturbance will be rehabilitated during the construction phase. Assumed disturbed area is 7.3ha.
2				Remove exposed pipeline valves and connection points	Sum		Yes	1,2	1,00	sum	R 100 000,00	R 100 000,00	R 100 000,00	
3				Remove pipeline	Overland HDPE pipelines on plinths (<200mm)		No	5.2.4	3650,00	m	R 17,07	R 62 305,50	R -	No allowance as pipeline is below ground level.
						SUB-TOTAL 1							**R 100 000,00**	
						Preliminaries and General	6%						R 6 000,00	
						Contingency	10%						R 10 000,00	
						SUB-TOTAL 2 (P&G's AND CONTINGENCIES)							**R 16 000,00**	
						GRAND-TOTAL							**R 116 000,00**	

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INFRASTRUCTURAL ASPECTS							Closure Forecast						2026	Year 6
1,7	LINEAR ITEMS													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1		5	2021	Proposed Water Pipeline										Pipeline to remain in-situ below ground after closure. Surface disturbance will be rehabilitated during the construction phase. Assumed disturbed area is 7.3ha.
2				Remove exposed pipeline valves and connection points	Sum		Yes	1,2	1,00	sum	R 100 000,00	R 100 000,00	R 100 000,00	
3				Remove pipeline	Overland HDPE pipelines on plinths (<200mm)		No	5.2.4	3650,00	m	R 17,07	R 62 305,50	R -	No allowance as pipeline is below ground level.
					SUB-TOTAL 1								**R 100 000,00**	
					Preliminaries and General	6%							R 6 000,00	
					Contingency	10%							R 10 000,00	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 16 000,00**	
					GRAND-TOTAL								**R 116 000,00**	

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INFRASTRUCTURAL ASPECTS							Closure Forecast						2027	Year 7
1,7	LINEAR ITEMS													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1		5	2021	Proposed Water Pipeline										Pipeline to remain in-situ below ground after closure. Surface disturbance will be rehabilitated during the construction phase. Assumed disturbed area is 7.3ha.
2				Remove exposed pipeline valves and connection points	Sum		Yes	1,2	1,00	sum	R 100 000,00	R 100 000,00	R 100 000,00	
3				Remove pipeline	Overland HDPE pipelines on plinths (<200mm)		No	5.2.4	3650,00	m	R 17,07	R 62 305,50	R -	No allowance as pipeline is below ground level.
					SUB-TOTAL 1								**R 100 000,00**	
					Preliminaries and General	6%							R 6 000,00	
					Contingency	10%							R 10 000,00	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 16 000,00**	
					GRAND-TOTAL								**R 116 000,00**	

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INFRASTRUCTURAL ASPECTS							Closure Forecast						2028	Year 8
1,7	LINEAR ITEMS													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1		5	2021	Proposed Water Pipeline										Pipeline to remain in-situ below ground after closure. Surface disturbance will be rehabilitated during the construction phase. Assumed disturbed area is 7.3ha.
2				Remove exposed pipeline valves and connection points	Sum		Yes	1,2	1,00	sum	R 100 000,00	R 100 000,00	R 100 000,00	
3				Remove pipeline	Overland HDPE pipelines on plinths (<200mm)		No	5.2.4	3650,00	m	R 17,07	R 62 305,50	R -	No allowance as pipeline is below ground level.
					SUB-TOTAL 1								**R 100 000,00**	
					Preliminaries and General	6%							R 6 000,00	
					Contingency	10%							R 10 000,00	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 16 000,00**	
					GRAND-TOTAL								**R 116 000,00**	

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INFRASTRUCTURAL ASPECTS							Closure Forecast						2029	Year 9
1,7	LINEAR ITEMS													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1		5	2021	Proposed Water Pipeline										Pipeline to remain in-situ below ground after closure. Surface disturbance will be rehabilitated during the construction phase. Assumed disturbed area is 7.3ha.
2				Remove exposed pipeline valves and connection points	Sum		Yes	1,2	1,00	sum	R 100 000,00	R 100 000,00	R 100 000,00	
3				Remove pipeline	Overland HDPE pipelines on plinths (<200mm)		No	5.2.4	3650,00	m	R 17,07	R 62 305,50	R -	No allowance as pipeline is below ground level.
					SUB-TOTAL 1								**R 100 000,00**	
					Preliminaries and General	6%							R 6 000,00	
					Contingency	10%							R 10 000,00	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 16 000,00**	
					GRAND-TOTAL								**R 116 000,00**	

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INFRASTRUCTURAL ASPECTS							Closure Forecast						2030	Year 10
1,7	LINEAR ITEMS													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1		5	2021	Proposed Water Pipeline										Pipeline to remain in-situ below ground after closure. Surface disturbance will be rehabilitated during the construction phase. Assumed disturbed area is 7.3ha.
2				Remove exposed pipeline valves and connection points	Sum		Yes	1,2	1,00	sum	R 100 000,00	R 100 000,00	R 100 000,00	
3				Remove pipeline	Overland HDPE pipelines on plinths (<200mm)		No	5.2.4	3650,00	m	R 17,07	R 62 305,50	R -	No allowance as pipeline is below ground level.
					SUB-TOTAL 1								**R 100 000,00**	
					Preliminaries and General	6%							R 6 000,00	
					Contingency	10%							R 10 000,00	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 16 000,00**	
					GRAND-TOTAL								**R 116 000,00**	

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SUMMARY - MINING ASPECTS												
2	MINING CLOSURE COMPONENTS & CRITERIA		Premature Closure	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast
ID	COMPONENT		2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
2,1	OPENCAST / PIT AREAS		-R 7 584 407,03	R 75 041 883,12	R 79 000 953,93	R 93 943 326,65	R 97 927 354,36	R 100 214 313,32	R 98 989 156,73	R 100 121 292,17	R 101 566 523,18	R 99 776 433,28
2,2	WASTE ROCK DUMPS - OVERBURDEN AND SPOILS		R 3 307 812,17	R 3 307 812,17	R 3 307 812,17	R 3 307 812,17	R 3 307 812,17	R 3 307 812,17	R 3 307 812,17	R 3 307 812,17	R 3 307 812,17	R 3 307 812,17
2,3	COARSE RESIDUE DEPOSITS - PROCESSING WASTE		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
2,4	FINE RESIDUE DEPOSITS - PROCESSING WASTE		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
	SUB-TOTAL 1		**-R 4 276 594,86**	**R 78 349 695,28**	**R 82 308 766,10**	**R 97 251 138,82**	**R 101 235 166,53**	**R 103 522 125,49**	**R 102 296 968,90**	**R 103 429 104,34**	**R 104 874 335,35**	**R 103 084 245,45**
	Preliminary and General	6%	-R 256 595,69	R 4 700 981,72	R 4 938 525,97	R 5 835 068,33	R 6 074 109,99	R 6 211 327,53	R 6 137 818,13	R 6 205 746,26	R 6 292 460,12	R 6 185 054,73
	Contingencies	10%	-R 427 659,49	R 7 834 969,53	R 8 230 876,61	R 9 725 113,88	R 10 123 516,65	R 10 352 212,55	R 10 229 696,89	R 10 342 910,43	R 10 487 433,53	R 10 308 424,54
	SUB-TOTAL 2 (P&G's AND CONTINGENCIES)		**-R 684 255,18**	**R 12 535 951,25**	**R 13 169 402,58**	**R 15 560 182,21**	**R 16 197 626,64**	**R 16 563 540,08**	**R 16 367 515,02**	**R 16 548 656,69**	**R 16 779 893,66**	**R 16 493 479,27**
	GRAND-TOTAL		**-R 4 960 850,04**	**R 90 885 646,53**	**R 95 478 168,68**	**R 112 811 321,03**	**R 117 432 793,17**	**R 120 085 665,56**	**R 118 664 483,93**	**R 119 977 761,03**	**R 121 654 229,00**	**R 119 577 724,72**

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MINING ASPECTS							Premature Closure						2021	Year 1
2,1	OPENCAST / PIT AREAS													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1		1	2021	Open Pit Expansion										All waste material to be cut and stockpiled on WRD (Year 1)
2				Backfill opencast operation	Load and haul 1km		Yes	9.6.1	-381349,00	m³	R 31,46	-R 11 997 239,54	-R 11 997 239,54	Load and haul material from waste rock dump
3				Shape and level area including stormwater control	Shaping, levelling of footprint areas (500mm)		Yes	10.1.1	19,45	ha	R 62 669,86	R 1 218 928,78	R 1 218 928,78	
4				Placement of topsoil	Load and haul 1km		Yes	9.6.1	77800,00	m³	R 31,46	R 2 447 588,00	R 2 447 588,00	Topsoil placement 400mm thick
5				Establish vegetation	Establishment of vegetation on WRD and tailings dams		Yes	10.4.2	19,45	ha	R 38 370,99	R 746 315,74	R 746 315,74	Includes soil amelioration, cultivation and seeding actions
						SUB-TOTAL 1							**-R 7 584 407,03**	
						Preliminaries and General 6%							**-R 455 064,42**	
						Contingency 10%							**-R 758 440,70**	
						SUB-TOTAL 2 (P&G's AND CONTINGENCIES)							**-R 1 213 505,12**	
						GRAND-TOTAL							**-R 8 797 912,15**	

Mokala Manganese Mine

EIA - Financial Provision FY2021

MINING ASPECTS							Closure Forecast						2022	Year 2
2,1	OPENCAST / PIT AREAS													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1		1	2021	Open Pit Expansion										All material to be cut and stockpiled on WRD (Year 2)
2				Backfill opencast operation	Load and haul 1km		Yes	9.6.1	2253697,00	m³	R 31,46	R 70 901 307,62	R 70 901 307,62	Load and haul material from waste rock dump
3				Shape and level area including stormwater control	Shaping, levelling of footprint areas (500mm)		Yes	10.1.1	18,25	ha	R 62 669,86	R 1 143 724,95	R 1 143 724,95	
4				Placement of topsoil	Load and haul 1km		Yes	9.6.1	73000,00	m³	R 31,46	R 2 296 580,00	R 2 296 580,00	Topsoil placement 400mm thick
5				Establish vegetation	Establishment of vegetation on WRD and tailings dams		Yes	10.4.2	18,25	ha	R 38 370,99	R 700 270,55	R 700 270,55	Includes soil amelioration, cultivation and seeding actions
						SUB-TOTAL 1							**R 75 041 883,12**	
						Preliminaries and General	6%						**R 4 502 512,99**	
						Contingency	10%						**R 7 504 188,31**	
						SUB-TOTAL 2 (P&G's AND CONTINGENCIES)							**R 12 006 701,30**	
						GRAND-TOTAL							**R 87 048 584,41**	

Mokala Manganese Mine

EIA - Financial Provision FY2021

MINING ASPECTS							Closure Forecast						2023	Year 3
2,1	OPENCAST / PIT AREAS													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1		1	2021	Open Pit Expansion										All material to be cut as part of Year 3 will be rolled over into cut 1
2				Backfill opencast operation	Load and haul 1km		Yes	9.6.1	2253697,00	m³	R 31,46	R 70 901 307,62	R 70 901 307,62	Load and haul material from waste rock dump
3				Shape and level area including stormwater control	Shaping, levelling of footprint areas (500mm)		Yes	10.1.1	35,70	ha	R 62 669,86	R 2 237 314,00	R 2 237 314,00	
4				Placement of topsoil	Load and haul 1km		Yes	9.6.1	142800,00	m³	R 31,46	R 4 492 488,00	R 4 492 488,00	Topsoil placement 400mm thick
5				Establish vegetation	Establishment of vegetation on WRD and tailings dams		Yes	10.4.2	35,70	ha	R 38 370,99	R 1 369 844,31	R 1 369 844,31	Includes soil amelioration, cultivation and seeding actions
					SUB-TOTAL 1								**R 79 000 953,93**	
					Preliminaries and General	6%							**R 4 740 057,24**	
					Contingency	10%							**R 7 900 095,39**	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 12 640 152,63**	
					GRAND-TOTAL								**R 91 641 106,56**	

Mokala Manganese Mine

EIA - Financial Provision FY2021

MINING ASPECTS							Closure Forecast						2024	Year 4
2,1	OPENCAST / PIT AREAS													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1		1	2021	Open Pit Expansion										All material to be cut as part of Year 4 will be rolled over into cut 2. Assume cut 1 has been shaped topsoiled and vegetated
2				Backfill opencast operation	Load and haul 1km		Yes	9.6.1	2253697,00	m³	R 31,46	R 70 901 307,62	R 70 901 307,62	Load and haul material from waste rock dump
3				Shape and level area including stormwater control	Shaping, levelling of footprint areas (500mm)		Yes	10.1.1	101,56	ha	R 62 669,86	R 6 364 750,98	R 6 364 750,98	
4				Placement of topsoil	Load and haul 1km		Yes	9.6.1	406240,00	m³	R 31,46	R 12 780 310,40	R 12 780 310,40	Topsoil placement 400mm thick
5				Establish vegetation	Establishment of vegetation on WRD and tailings dams		Yes	10.4.2	101,56	ha	R 38 370,99	R 3 896 957,65	R 3 896 957,65	Includes soil amelioration, cultivation and seeding actions
					SUB-TOTAL 1								**R 93 943 326,65**	
					Preliminaries and General	6%							**R 5 636 599,60**	
					Contingency	10%							**R 9 394 332,67**	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 15 030 932,26**	
					GRAND-TOTAL								**R 108 974 258,91**	

Mokala Manganese Mine

EIA - Financial Provision FY2021

MINING ASPECTS							Closure Forecast						2025	Year 5
2,1	OPENCAST / PIT AREAS													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1		1	2021	Open Pit Expansion										All material to be cut as part of Year 5 will be rolled over into cut 3. Assume up to cut 2 has been shaped topsoiled and vegetated
2				Backfill opencast operation	Load and haul 1km		Yes	9.6.1	2253697,00	m³	R 31,46	R 70 901 307,62	R 70 901 307,62	Load and haul material from waste rock dump
3				Shape and level area including stormwater control	Shaping, levelling of footprint areas (500mm)		Yes	10.1.1	119,12	ha	R 62 669,86	R 7 465 233,72	R 7 465 233,72	
4				Placement of topsoil	Load and haul 1km		Yes	9.6.1	476480,00	m³	R 31,46	R 14 990 060,80	R 14 990 060,80	Topsoil placement 400mm thick
5				Establish vegetation	Establishment of vegetation on WRD and tailings dams		Yes	10.4.2	119,12	ha	R 38 370,99	R 4 570 752,22	R 4 570 752,22	Includes soil amelioration, cultivation and seeding actions
					SUB-TOTAL 1								**R 97 927 354,36**	
					Preliminaries and General	6%							**R 5 875 641,26**	
					Contingency	10%							**R 9 792 735,44**	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 15 668 376,70**	
					GRAND-TOTAL								**R 113 595 731,06**	

Mokala Manganese Mine

EIA - Financial Provision FY2021

MINING ASPECTS							Closure Forecast						2026	Year 6
2,1	OPENCAST / PIT AREAS													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1		1	2021	Open Pit Expansion										All material to be cut as part of Year 6 will be rolled over into cut 4. Assume up to cut 3 has been shaped topsoiled and vegetated
2				Backfill opencast operation	Load and haul 1km		Yes	9.6.1	2253697,00	m³	R 31,46	R 70 901 307,62	R 70 901 307,62	Load and haul material from waste rock dump
3				Shape and level area including stormwater control	Shaping, levelling of footprint areas (500mm)		Yes	10.1.1	129,20	ha	R 62 669,86	R 8 096 945,91	R 8 096 945,91	
4				Placement of topsoil	Load and haul 1km		Yes	9.6.1	516800,00	m³	R 31,46	R 16 258 528,00	R 16 258 528,00	Topsoil placement 400mm thick
5				Establish vegetation	Establishment of vegetation on WRD and tailings dams		Yes	10.4.2	129,20	ha	R 38 370,99	R 4 957 531,79	R 4 957 531,79	Includes soil amelioration, cultivation and seeding actions
					SUB-TOTAL 1								**R 100 214 313,32**	
					Preliminaries and General	6%							**R 6 012 858,80**	
					Contingency	10%							**R 10 021 431,33**	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 16 034 290,13**	
					GRAND-TOTAL								**R 116 248 603,45**	

Mokala Manganese Mine

EIA - Financial Provision FY2021

MINING ASPECTS							Closure Forecast						2027	Year 7
2,1	OPENCAST / PIT AREAS													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1		1	2021	Open Pit Expansion										All material to be cut as part of Year 7 will be rolled over into cut 5. Assume up to cut 4 has been shaped topsoiled and vegetated
2				Backfill opencast operation	Load and haul 1km		Yes	9.6.1	2253697,00	m³	R 31,46	R 70 901 307,62	R 70 901 307,62	Load and haul material from waste rock dump
3				Shape and level area including stormwater control	Shaping, levelling of footprint areas (500mm)		Yes	10.1.1	123,80	ha	R 62 669,86	R 7 758 528,67	R 7 758 528,67	
4				Placement of topsoil	Load and haul 1km		Yes	9.6.1	495200,00	m³	R 31,46	R 15 578 992,00	R 15 578 992,00	Topsoil placement 400mm thick
5				Establish vegetation	Establishment of vegetation on WRD and tailings dams		Yes	10.4.2	123,80	ha	R 38 370,99	R 4 750 328,45	R 4 750 328,45	Includes soil amelioration, cultivation and seeding actions
					SUB-TOTAL 1								**R 98 989 156,73**	
					Preliminaries and General	6%							**R 5 939 349,40**	
					Contingency	10%							**R 9 898 915,67**	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 15 838 265,08**	
					GRAND-TOTAL								**R 114 827 421,81**	

Mokala Manganese Mine

EIA - Financial Provision FY2021

MINING ASPECTS							Closure Forecast						2028	Year 8
2,1	OPENCAST / PIT AREAS													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1		1	2021	Open Pit Expansion										All material to be cut as part of Year 8 will be rolled over into cut 6 and portion of cut 7. Assume up to cut 5 has been shaped topsoiled and
2				Backfill opencast operation	Load and haul 1km		Yes	9.6.1	2253697,00	m³	R 31,46	R 70 901 307,62	R 70 901 307,62	Load and haul material from waste rock dump
3				Shape and level area including stormwater control	Shaping, levelling of footprint areas (500mm)		Yes	10.1.1	128,79	ha	R 62 669,86	R 8 071 251,27	R 8 071 251,27	
4				Placement of topsoil	Load and haul 1km		Yes	9.6.1	515160,00	m³	R 31,46	R 16 206 933,60	R 16 206 933,60	Topsoil placement 400mm thick
5				Establish vegetation	Establishment of vegetation on WRD and tailings dams		Yes	10.4.2	128,79	ha	R 38 370,99	R 4 941 799,68	R 4 941 799,68	Includes soil amelioration, cultivation and seeding actions
					SUB-TOTAL 1								**R 100 121 292,17**	
					Preliminaries and General	6%							**R 6 007 277,53**	
					Contingency	10%							**R 10 012 129,22**	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 16 019 406,75**	
					GRAND-TOTAL								**R 116 140 698,92**	

Mokala Manganese Mine

EIA - Financial Provision FY2021

MINING ASPECTS							Closure Forecast						2029	Year 9
2,1	OPENCAST / PIT AREAS													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1		1	2021	Open Pit Expansion										All material to be cut as part of Year 9 will be rolled over into cut 7 and portion of cut 8. Assume up to cut 6 has been shaped topsoiled and
2				Backfill opencast operation	Load and haul 1km		Yes	9.6.1	2253697,00	m³	R 31,46	R 70 901 307,62	R 70 901 307,62	Load and haul material from waste rock dump
3				Shape and level area including stormwater control	Shaping, levelling of footprint areas (500mm)		Yes	10.1.1	135,16	ha	R 62 669,86	R 8 470 458,28	R 8 470 458,28	
4				Placement of topsoil	Load and haul 1km		Yes	9.6.1	540640,00	m³	R 31,46	R 17 008 534,40	R 17 008 534,40	Topsoil placement 400mm thick
5				Establish vegetation	Establishment of vegetation on WRD and tailings dams		Yes	10.4.2	135,16	ha	R 38 370,99	R 5 186 222,88	R 5 186 222,88	Includes soil amelioration, cultivation and seeding actions
						SUB-TOTAL 1							**R 101 566 523,18**	
						Preliminaries and General	6%						**R 6 093 991,39**	
						Contingency	10%						**R 10 156 652,32**	
						SUB-TOTAL 2 (P&G's AND CONTINGENCIES)							**R 16 250 643,71**	
						GRAND-TOTAL							**R 117 817 166,89**	

Mokala Manganese Mine

EIA - Financial Provision FY2021

MINING ASPECTS							Closure Forecast						2030	Year 10
2,1	OPENCAST / PIT AREAS													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1		1	2021	Open Pit Expansion										All material to be cut as part of Year 10 will be rolled over into cut 8 and portion of cut 9. Assume up to cut 7 has been shaped topsoiled and
2				Backfill opencast operation	Load and haul 1km		Yes	9.6.1	2253697,00	m³	R 31,46	R 70 901 307,62	R 70 901 307,62	Load and haul material from waste rock dump
3				Shape and level area including stormwater control	Shaping, levelling of footprint areas (500mm)		Yes	10.1.1	127,27	ha	R 62 669,86	R 7 975 993,08	R 7 975 993,08	
4				Placement of topsoil	Load and haul 1km		Yes	9.6.1	509080,00	m³	R 31,46	R 16 015 656,80	R 16 015 656,80	Topsoil placement 400mm thick
5				Establish vegetation	Establishment of vegetation on WRD and tailings dams		Yes	10.4.2	127,27	ha	R 38 370,99	R 4 883 475,78	R 4 883 475,78	Includes soil amelioration, cultivation and seeding actions
						SUB-TOTAL 1							**R 99 776 433,28**	
						Preliminaries and General	6%						**R 5 986 586,00**	
						Contingency	10%						**R 9 977 643,33**	
						SUB-TOTAL 2 (P&G's AND CONTINGENCIES)							**R 15 964 229,32**	
						GRAND-TOTAL							**R 115 740 662,60**	

Mokala Manganese Mine

EIA - Financial Provision FY2021

MINING ASPECTS							Premature Closure						2021	Year 1
2,2		WASTE ROCK DUMPS - OVERBURDEN AND SPOILS												
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1		36	2021	Topsoil Stockpile 01 (5,73ha)										5,73ha topsoil Footprint
2				Dozing	Shaping, levelling of footprint areas (500mm)		No	10.1.1	5,73	ha	R 62 669,86	R 359 098,30	R -	No allowance, assume footprint will be shaped and levelled as material is removed
3				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	5,73	ha	R 14 659,31	R 83 997,85	R 83 997,85	500mm deep ripping
4				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	5,73	ha	R 15 658,65	R 89 724,06	R 89 724,06	Includes soil amelioration, cultivation and seeding actions
5		43	2021	Waste Rock Dump Expansion (20,07ha)										
6				Dozing	Bulk dozing of material (100m max)		No	9.1.5	0,00	m³	R 27,29	R -	R -	No allowance assume remaining benches will be reshaped as material are removed for backfilling
7				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	20,07	ha	R 14 659,31	R 294 212,35	R 294 212,35	500mm deep ripping
8				Placement of topsoil	Load and haul 1km		Yes	9.6.1	80280,00	m³	R 31,46	R 2 525 608,80	R 2 525 608,80	Topsoil placement 400mm thick
9				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	20,07	ha	R 15 658,65	R 314 269,11	R 314 269,11	Includes soil amelioration, cultivation and seeding actions
10		43	2021	New Waste Rock Dump (81,06ha)										WRD will be constructed outside the 1-10 year forecast
11				Dozing	Bulk dozing of material (100m max)		No	9.1.5	0,00	m³	R 27,29	R -	R -	
12				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	0,00	ha	R 14 659,31	R -	R -	
13				Placement of topsoil	Load and haul 1km		Yes	9.6.1	0,00	m³	R 31,46	R -	R -	
14				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	0,00	ha	R 15 658,65	R -	R -	
					SUB-TOTAL 1								**R 3 307 812,17**	
					Preliminaries and General	6%							R 198 468,73	
					Contingency	10%							R 330 781,22	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 529 249,95**	
					GRAND-TOTAL								**R 3 837 062,11**	

Mokala Manganese Mine

EIA - Financial Provision FY2021

MINING ASPECTS							Closure Forecast						2022	Year 2
2,2	WASTE ROCK DUMPS - OVERBURDEN AND SPOILS													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1		36	2021	Topsoil Stockpile 01 (5,73ha)										5,73ha topsoil Footprint
2				Dozing	Shaping, levelling of footprint areas (500mm)		No	10.1.1	5,73	ha	R 62 669,86	R 359 098,30	R -	No allowance, assume footprint will be shaped and levelled as material is removed
3				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	5,73	ha	R 14 659,31	R 83 997,85	R 83 997,85	500mm deep ripping
4				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	5,73	ha	R 15 658,65	R 89 724,06	R 89 724,06	Includes soil amelioration, cultivation and seeding actions
5		43	2021	Waste Rock Dump Expansion (20,07ha)										
6				Dozing	Bulk dozing of material (100m max)		No	9.1.5	0,00	m³	R 27,29	R -	R -	No allowance assume remaining benches will be reshaped as material are removed for backfilling
7				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	20,07	ha	R 14 659,31	R 294 212,35	R 294 212,35	500mm deep ripping
8				Placement of topsoil	Load and haul 1km		Yes	9.6.1	80280,00	m³	R 31,46	R 2 525 608,80	R 2 525 608,80	Topsoil placement 400mm thick
9				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	20,07	ha	R 15 658,65	R 314 269,11	R 314 269,11	Includes soil amelioration, cultivation and seeding actions
10		43	2021	New Waste Rock Dump (81,06ha)										WRD will be constructed outside the 1-10 year forecast
11				Dozing	Bulk dozing of material (100m max)		No	9.1.5	0,00	m³	R 27,29	R -	R -	
12				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	0,00	ha	R 14 659,31	R -	R -	
13				Placement of topsoil	Load and haul 1km		Yes	9.6.1	0,00	m³	R 31,46	R -	R -	
14				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	0,00	ha	R 15 658,65	R -	R -	
					SUB-TOTAL 1								**R 3 307 812,17**	
					Preliminaries and General	6%							R 198 468,73	
					Contingency	10%							R 330 781,22	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 529 249,95**	
					GRAND-TOTAL								**R 3 837 062,11**	

Mokala Manganese Mine

EIA - Financial Provision FY2021

MINING ASPECTS							Closure Forecast						2023	Year 3
2,2	WASTE ROCK DUMPS - OVERBURDEN AND SPOILS													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1		36	2021	Topsoil Stockpile 01 (5,73ha)										5,73ha topsoil Footprint
2				Dozing	Shaping, levelling of footprint areas (500mm)		No	10.1.1	5,73	ha	R 62 669,86	R 359 098,30	R -	No allowance, assume footprint will be shaped and levelled as material is removed
3				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	5,73	ha	R 14 659,31	R 83 997,85	R 83 997,85	500mm deep ripping
4				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	5,73	ha	R 15 658,65	R 89 724,06	R 89 724,06	Includes soil amelioration, cultivation and seeding actions
5		43	2021	Waste Rock Dump Expansion (20,07ha)										
6				Dozing	Bulk dozing of material (100m max)		No	9.1.5	0,00	m³	R 27,29	R -	R -	No allowance assume remaining benches will be reshaped as material are removed for backfilling
7				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	20,07	ha	R 14 659,31	R 294 212,35	R 294 212,35	500mm deep ripping
8				Placement of topsoil	Load and haul 1km		Yes	9.6.1	80280,00	m³	R 31,46	R 2 525 608,80	R 2 525 608,80	Topsoil placement 400mm thick
9				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	20,07	ha	R 15 658,65	R 314 269,11	R 314 269,11	Includes soil amelioration, cultivation and seeding actions
10		43	2021	New Waste Rock Dump (81,06ha)										WRD will be constructed outside the 1-10 year forecast
11				Dozing	Bulk dozing of material (100m max)		No	9.1.5	0,00	m³	R 27,29	R -	R -	
12				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	0,00	ha	R 14 659,31	R -	R -	
13				Placement of topsoil	Load and haul 1km		Yes	9.6.1	0,00	m³	R 31,46	R -	R -	
14				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	0,00	ha	R 15 658,65	R -	R -	
					SUB-TOTAL 1								**R 3 307 812,17**	
					Preliminaries and General	6%							R 198 468,73	
					Contingency	10%							R 330 781,22	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 529 249,95**	
					GRAND-TOTAL								**R 3 837 062,11**	

Mokala Manganese Mine

EIA - Financial Provision FY2021

MINING ASPECTS							Closure Forecast						2024	Year 4
2,2	WASTE ROCK DUMPS - OVERBURDEN AND SPOILS													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1		36	2021	Topsoil Stockpile 01 (5,73ha)										5,73ha topsoil Footprint
2				Dozing	Shaping, levelling of footprint areas (500mm)		No	10.1.1	5,73	ha	R 62 669,86	R 359 098,30	R -	No allowance, assume footprint will be shaped and levelled as material is removed
3				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	5,73	ha	R 14 659,31	R 83 997,85	R 83 997,85	500mm deep ripping
4				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	5,73	ha	R 15 658,65	R 89 724,06	R 89 724,06	Includes soil amelioration, cultivation and seeding actions
5		43	2021	Waste Rock Dump Expansion (20,07ha)										
6				Dozing	Bulk dozing of material (100m max)		No	9.1.5	0,00	m³	R 27,29	R -	R -	No allowance assume remaining benches will be reshaped as material are removed for backfilling
7				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	20,07	ha	R 14 659,31	R 294 212,35	R 294 212,35	500mm deep ripping
8				Placement of topsoil	Load and haul 1km		Yes	9.6.1	80280,00	m³	R 31,46	R 2 525 608,80	R 2 525 608,80	Topsoil placement 400mm thick
9				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	20,07	ha	R 15 658,65	R 314 269,11	R 314 269,11	Includes soil amelioration, cultivation and seeding actions
10		43	2021	New Waste Rock Dump (81,06ha)										WRD will be constructed outside the 1-10 year forecast
11				Dozing	Bulk dozing of material (100m max)		No	9.1.5	0,00	m³	R 27,29	R -	R -	
12				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	0,00	ha	R 14 659,31	R -	R -	
13				Placement of topsoil	Load and haul 1km		Yes	9.6.1	0,00	m³	R 31,46	R -	R -	
14				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	0,00	ha	R 15 658,65	R -	R -	
					SUB-TOTAL 1								**R 3 307 812,17**	
					Preliminaries and General	6%							R 198 468,73	
					Contingency	10%							R 330 781,22	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 529 249,95**	
					GRAND-TOTAL								**R 3 837 062,11**	

Mokala Manganese Mine

EIA - Financial Provision FY2021

MINING ASPECTS							Closure Forecast						2025	Year 5
2,2	WASTE ROCK DUMPS - OVERBURDEN AND SPOILS													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1		36	2021	Topsoil Stockpile 01 (5,73ha)										5,73ha topsoil Footprint
2				Dozing	Shaping, levelling of footprint areas (500mm)		No	10.1.1	5,73	ha	R 62 669,86	R 359 098,30	R -	No allowance, assume footprint will be shaped and levelled as material is removed
3				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	5,73	ha	R 14 659,31	R 83 997,85	R 83 997,85	500mm deep ripping
4				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	5,73	ha	R 15 658,65	R 89 724,06	R 89 724,06	Includes soil amelioration, cultivation and seeding actions
5		43	2021	Waste Rock Dump Expansion (20,07ha)										
6				Dozing	Bulk dozing of material (100m max)		No	9.1.5	0,00	m³	R 27,29	R -	R -	No allowance assume remaining benches will be reshaped as material are removed for backfilling
7				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	20,07	ha	R 14 659,31	R 294 212,35	R 294 212,35	500mm deep ripping
8				Placement of topsoil	Load and haul 1km		Yes	9.6.1	80280,00	m³	R 31,46	R 2 525 608,80	R 2 525 608,80	Topsoil placement 400mm thick
9				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	20,07	ha	R 15 658,65	R 314 269,11	R 314 269,11	Includes soil amelioration, cultivation and seeding actions
10		43	2021	New Waste Rock Dump (81,06ha)										WRD will be constructed outside the 1-10 year forecast
11				Dozing	Bulk dozing of material (100m max)		No	9.1.5	0,00	m³	R 27,29	R -	R -	
12				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	0,00	ha	R 14 659,31	R -	R -	
13				Placement of topsoil	Load and haul 1km		Yes	9.6.1	0,00	m³	R 31,46	R -	R -	
14				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	0,00	ha	R 15 658,65	R -	R -	
					SUB-TOTAL 1								**R 3 307 812,17**	
					Preliminaries and General	6%							R 198 468,73	
					Contingency	10%							R 330 781,22	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 529 249,95**	
					GRAND-TOTAL								**R 3 837 062,11**	

Mokala Manganese Mine

EIA - Financial Provision FY2021

MINING ASPECTS							Closure Forecast						2026	Year 6
2,2	WASTE ROCK DUMPS - OVERBURDEN AND SPOILS													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1		36	2021	Topsoil Stockpile 01 (5,73ha)										5,73ha topsoil Footprint
2				Dozing	Shaping, levelling of footprint areas (500mm)		No	10.1.1	5,73	ha	R 62 669,86	R 359 098,30	R -	No allowance, assume footprint will be shaped and levelled as material is removed
3				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	5,73	ha	R 14 659,31	R 83 997,85	R 83 997,85	500mm deep ripping
4				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	5,73	ha	R 15 658,65	R 89 724,06	R 89 724,06	Includes soil amelioration, cultivation and seeding actions
5		43	2021	Waste Rock Dump Expansion (20,07ha)										
6				Dozing	Bulk dozing of material (100m max)		No	9.1.5	0,00	m³	R 27,29	R -	R -	No allowance assume remaining benches will be reshaped as material are removed for backfilling
7				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	20,07	ha	R 14 659,31	R 294 212,35	R 294 212,35	500mm deep ripping
8				Placement of topsoil	Load and haul 1km		Yes	9.6.1	80280,00	m³	R 31,46	R 2 525 608,80	R 2 525 608,80	Topsoil placement 400mm thick
9				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	20,07	ha	R 15 658,65	R 314 269,11	R 314 269,11	Includes soil amelioration, cultivation and seeding actions
10		43	2021	New Waste Rock Dump (81,06ha)										WRD will be constructed outside the 1-10 year forecast
11				Dozing	Bulk dozing of material (100m max)		No	9.1.5	0,00	m³	R 27,29	R -	R -	
12				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	0,00	ha	R 14 659,31	R -	R -	
13				Placement of topsoil	Load and haul 1km		Yes	9.6.1	0,00	m³	R 31,46	R -	R -	
14				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	0,00	ha	R 15 658,65	R -	R -	
					SUB-TOTAL 1								**R 3 307 812,17**	
					Preliminaries and General	6%							R 198 468,73	
					Contingency	10%							R 330 781,22	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 529 249,95**	
					GRAND-TOTAL								**R 3 837 062,11**	

Mokala Manganese Mine

EIA - Financial Provision FY2021

MINING ASPECTS							Closure Forecast						2027	Year 7
2,2	WASTE ROCK DUMPS - OVERBURDEN AND SPOILS													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1		36	2021	Topsoil Stockpile 01 (5,73ha)										5,73ha topsoil Footprint
2				Dozing	Shaping, levelling of footprint areas (500mm)		No	10.1.1	5,73	ha	R 62 669,86	R 359 098,30	R -	No allowance, assume footprint will be shaped and levelled as material is removed
3				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	5,73	ha	R 14 659,31	R 83 997,85	R 83 997,85	500mm deep ripping
4				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	5,73	ha	R 15 658,65	R 89 724,06	R 89 724,06	Includes soil amelioration, cultivation and seeding actions
5		43	2021	Waste Rock Dump Expansion (20,07ha)										
6				Dozing	Bulk dozing of material (100m max)		No	9.1.5	0,00	m³	R 27,29	R -	R -	No allowance assume remaining benches will be reshaped as material are removed for backfilling
7				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	20,07	ha	R 14 659,31	R 294 212,35	R 294 212,35	500mm deep ripping
8				Placement of topsoil	Load and haul 1km		Yes	9.6.1	80280,00	m³	R 31,46	R 2 525 608,80	R 2 525 608,80	Topsoil placement 400mm thick
9				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	20,07	ha	R 15 658,65	R 314 269,11	R 314 269,11	Includes soil amelioration, cultivation and seeding actions
10		43	2021	New Waste Rock Dump (81,06ha)										WRD will be constructed outside the 1-10 year forecast
11				Dozing	Bulk dozing of material (100m max)		No	9.1.5	0,00	m³	R 27,29	R -	R -	
12				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	0,00	ha	R 14 659,31	R -	R -	
13				Placement of topsoil	Load and haul 1km		Yes	9.6.1	0,00	m³	R 31,46	R -	R -	
14				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	0,00	ha	R 15 658,65	R -	R -	
					SUB-TOTAL 1								**R 3 307 812,17**	
					Preliminaries and General	6%							R 198 468,73	
					Contingency	10%							R 330 781,22	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 529 249,95**	
					GRAND-TOTAL								**R 3 837 062,11**	

Mokala Manganese Mine

EIA - Financial Provision FY2021

MINING ASPECTS							Closure Forecast						2028	Year 8
2,2	WASTE ROCK DUMPS - OVERBURDEN AND SPOILS													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1		36	2021	Topsoil Stockpile 01 (5,73ha)										5,73ha topsoil Footprint
2				Dozing	Shaping, levelling of footprint areas (500mm)		No	10.1.1	5,73	ha	R 62 669,86	R 359 098,30	R -	No allowance, assume footprint will be shaped and levelled as material is removed
3				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	5,73	ha	R 14 659,31	R 83 997,85	R 83 997,85	500mm deep ripping
4				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	5,73	ha	R 15 658,65	R 89 724,06	R 89 724,06	Includes soil amelioration, cultivation and seeding actions
5		43	2021	Waste Rock Dump Expansion (20,07ha)										
6				Dozing	Bulk dozing of material (100m max)		No	9.1.5	0,00	m³	R 27,29	R -	R -	No allowance assume remaining benches will be reshaped as material are removed for backfilling
7				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	20,07	ha	R 14 659,31	R 294 212,35	R 294 212,35	500mm deep ripping
8				Placement of topsoil	Load and haul 1km		Yes	9.6.1	80280,00	m³	R 31,46	R 2 525 608,80	R 2 525 608,80	Topsoil placement 400mm thick
9				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	20,07	ha	R 15 658,65	R 314 269,11	R 314 269,11	Includes soil amelioration, cultivation and seeding actions
10		43	2021	New Waste Rock Dump (81,06ha)										WRD will be constructed outside the 1-10 year forecast
11				Dozing	Bulk dozing of material (100m max)		No	9.1.5	0,00	m³	R 27,29	R -	R -	
12				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	0,00	ha	R 14 659,31	R -	R -	
13				Placement of topsoil	Load and haul 1km		Yes	9.6.1	0,00	m³	R 31,46	R -	R -	
14				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	0,00	ha	R 15 658,65	R -	R -	
					SUB-TOTAL 1								**R 3 307 812,17**	
					Preliminaries and General	6%							R 198 468,73	
					Contingency	10%							R 330 781,22	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 529 249,95**	
					GRAND-TOTAL								**R 3 837 062,11**	

Mokala Manganese Mine

EIA - Financial Provision FY2021

MINING ASPECTS							Closure Forecast						2029	Year 9
2,2	WASTE ROCK DUMPS - OVERBURDEN AND SPOILS													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1		36	2021	Topsoil Stockpile 01 (5,73ha)										5,73ha topsoil Footprint
2				Dozing	Shaping, levelling of footprint areas (500mm)		No	10.1.1	5,73	ha	R 62 669,86	R 359 098,30	R -	No allowance, assume footprint will be shaped and levelled as material is removed
3				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	5,73	ha	R 14 659,31	R 83 997,85	R 83 997,85	500mm deep ripping
4				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	5,73	ha	R 15 658,65	R 89 724,06	R 89 724,06	Includes soil amelioration, cultivation and seeding actions
5		43	2021	Waste Rock Dump Expansion (20,07ha)										
6				Dozing	Bulk dozing of material (100m max)		No	9.1.5	0,00	m³	R 27,29	R -	R -	No allowance assume remaining benches will be reshaped as material are removed for backfilling
7				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	20,07	ha	R 14 659,31	R 294 212,35	R 294 212,35	500mm deep ripping
8				Placement of topsoil	Load and haul 1km		Yes	9.6.1	80280,00	m³	R 31,46	R 2 525 608,80	R 2 525 608,80	Topsoil placement 400mm thick
9				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	20,07	ha	R 15 658,65	R 314 269,11	R 314 269,11	Includes soil amelioration, cultivation and seeding actions
10		43	2021	New Waste Rock Dump (81,06ha)										WRD will be constructed outside the 1-10 year forecast
11				Dozing	Bulk dozing of material (100m max)		No	9.1.5	0,00	m³	R 27,29	R -	R -	
12				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	0,00	ha	R 14 659,31	R -	R -	
13				Placement of topsoil	Load and haul 1km		Yes	9.6.1	0,00	m³	R 31,46	R -	R -	
14				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	0,00	ha	R 15 658,65	R -	R -	
					SUB-TOTAL 1								**R 3 307 812,17**	
					Preliminaries and General	6%							R 198 468,73	
					Contingency	10%							R 330 781,22	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 529 249,95**	
					GRAND-TOTAL								**R 3 837 062,11**	

Mokala Manganese Mine

EIA - Financial Provision FY2021

MINING ASPECTS							Closure Forecast						2030	Year 10
2,2	WASTE ROCK DUMPS - OVERBURDEN AND SPOILS													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1		36	2021	Topsoil Stockpile 01 (5,73ha)										5,73ha topsoil Footprint
2				Dozing	Shaping, levelling of footprint areas (500mm)		No	10.1.1	5,73	ha	R 62 669,86	R 359 098,30	R -	No allowance, assume footprint will be shaped and levelled as material is removed
3				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	5,73	ha	R 14 659,31	R 83 997,85	R 83 997,85	500mm deep ripping
4				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	5,73	ha	R 15 658,65	R 89 724,06	R 89 724,06	Includes soil amelioration, cultivation and seeding actions
5		43	2021	Waste Rock Dump Expansion (20,07ha)										
6				Dozing	Bulk dozing of material (100m max)		No	9.1.5	0,00	m³	R 27,29	R -	R -	No allowance assume remaining benches will be reshaped as material are removed for backfilling
7				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	20,07	ha	R 14 659,31	R 294 212,35	R 294 212,35	500mm deep ripping
8				Placement of topsoil	Load and haul 1km		Yes	9.6.1	80280,00	m³	R 31,46	R 2 525 608,80	R 2 525 608,80	Topsoil placement 400mm thick
9				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	20,07	ha	R 15 658,65	R 314 269,11	R 314 269,11	Includes soil amelioration, cultivation and seeding actions
10		43	2021	New Waste Rock Dump (81,06ha)										WRD will be constructed outside the 1-10 year forecast
11				Dozing	Bulk dozing of material (100m max)		No	9.1.5	0,00	m³	R 27,29	R -	R -	
12				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	0,00	ha	R 14 659,31	R -	R -	
13				Placement of topsoil	Load and haul 1km		Yes	9.6.1	0,00	m³	R 31,46	R -	R -	
14				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	0,00	ha	R 15 658,65	R -	R -	
					SUB-TOTAL 1								**R 3 307 812,17**	
					Preliminaries and General	6%							R 198 468,73	
					Contingency	10%							R 330 781,22	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 529 249,95**	
					GRAND-TOTAL								**R 3 837 062,11**	

Mokala Manganese Mine

EIA - Financial Provision FY2021

SUMMARY - GENERAL ASPECTS												
5	GENERAL CLOSURE COMPONENTS & CRITERIA		Premature Closure	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast
ID	COMPONENT		2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
5,1	GENERAL SURFACES		R 2 543 535,65	R 2 543 535,65	R 2 543 535,65	R 2 543 535,65	R 2 543 535,65	R 2 543 535,65	R 2 543 535,65	R 2 543 535,65	R 2 543 535,65	R 2 543 535,65
5,2	POST CLOSURE MONITORING AND MAINTENANCE		R 897 993,60	R 888 312,31	R 1 029 094,37	R 1 560 435,73	R 1 702 105,25	R 1 783 428,06	R 1 739 862,27	R 1 780 120,29	R 1 831 511,80	R 1 767 857,33
5,3	SPECIALIST STUDIES		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
	SUB-TOTAL 1		**R 3 441 529,25**	**R 3 431 847,96**	**R 3 572 630,03**	**R 4 103 971,38**	**R 4 245 640,90**	**R 4 326 963,72**	**R 4 283 397,92**	**R 4 323 655,94**	**R 4 375 047,45**	**R 4 311 392,98**
	Preliminary and General	6%	R 206 491,76	R 205 910,88	R 214 357,80	R 246 238,28	R 254 738,45	R 259 617,82	R 257 003,88	R 259 419,36	R 262 502,85	R 258 683,58
	Contingencies	10%	R 344 152,93	R 343 184,80	R 357 263,00	R 410 397,14	R 424 564,09	R 432 696,37	R 428 339,79	R 432 365,59	R 437 504,74	R 431 139,30
	SUB-TOTAL 2 (P&G's AND CONTINGENCIES)		**R 550 644,68**	**R 549 095,67**	**R 571 620,80**	**R 656 635,42**	**R 679 302,54**	**R 692 314,19**	**R 685 343,67**	**R 691 784,95**	**R 700 007,59**	**R 689 822,88**
	GRAND-TOTAL		**R 3 992 173,93**	**R 3 980 943,64**	**R 4 144 250,83**	**R 4 760 606,81**	**R 4 924 943,44**	**R 5 019 277,91**	**R 4 968 741,59**	**R 5 015 440,90**	**R 5 075 055,04**	**R 5 001 215,86**

Mokala Manganese Mine

EIA - Financial Provision FY2021

GENERAL ASPECTS							Premature Closure						2021	Year 1
5,1	GENERAL SURFACES													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1		6	2021	Proposed ROM and Product Stockpile Expansion										
2				Import growthmedium from local topsoil stockpile	Load and haul 1km		Yes	9.6.1	55720,00	m³	R 31,46	R 1 752 951,20	R 1 752 951,20	Topsoil placement 400mm thick
3				Rip footprint area	Ripping of areas to alleviate compaction		Yes	9.5.1	13,93	ha	R 14 659,31	R 204 204,19	R 204 204,19	
4				Establish vetegation	Establishment of vegetation on WRD and tailings dams		Yes	10.4.2	13,93	ha	R 38 370,99	R 534 507,88	R 534 507,88	Includes soil amelioration, cultivation and seeding actions
5														
6		7	2021	Proposed Top Up Stockpile										
7				Import growthmedium from local topsoil stockpile	Load and haul 1km		Yes	9.6.1	1160,00	m³	R 31,46	R 36 493,60	R 36 493,60	Topsoil placement 400mm thick
8				Rip footprint area	Ripping of areas to alleviate compaction		Yes	9.5.1	0,29	ha	R 14 659,31	R 4 251,20	R 4 251,20	
9				Establish vetegation	Establishment of vegetation on WRD and tailings dams		Yes	10.4.2	0,29	ha	R 38 370,99	R 11 127,59	R 11 127,59	Includes soil amelioration, cultivation and seeding actions
					SUB-TOTAL 1								**R 2 543 535,65**	
					Preliminaries and General	6%							R 152 612,14	
					Contingency	10%							R 254 353,57	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 406 965,70**	
					GRAND-TOTAL								**R 2 950 501,36**	

Mokala Manganese Mine

EIA - Financial Provision FY2021

GENERAL ASPECTS							Closure Forecast						2022	Year 2
5,1	GENERAL SURFACES													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1		6	2021	Proposed ROM and Product Stockpile Expansion										
2				Import growthmedium from local topsoil stockpile	Load and haul 1km		Yes	9.6.1	55720,00	m³	R 31,46	R 1 752 951,20	R 1 752 951,20	Topsoil placement 400mm thick
3				Rip footprint area	Ripping of areas to alleviate compaction		Yes	9.5.1	13,93	ha	R 14 659,31	R 204 204,19	R 204 204,19	
4				Establish vetegation	Establishment of vegetation on WRD and tailings dams		Yes	10.4.2	13,93	ha	R 38 370,99	R 534 507,88	R 534 507,88	Includes soil amelioration, cultivation and seeding actions
5														
6		7	2021	Proposed Top Up Stockpile										
7				Import growthmedium from local topsoil stockpile	Load and haul 1km		Yes	9.6.1	1160,00	m³	R 31,46	R 36 493,60	R 36 493,60	Topsoil placement 400mm thick
8				Rip footprint area	Ripping of areas to alleviate compaction		Yes	9.5.1	0,29	ha	R 14 659,31	R 4 251,20	R 4 251,20	
9				Establish vetegation	Establishment of vegetation on WRD and tailings dams		Yes	10.4.2	0,29	ha	R 38 370,99	R 11 127,59	R 11 127,59	Includes soil amelioration, cultivation and seeding actions
					SUB-TOTAL 1								**R 2 543 535,65**	
					Preliminaries and General	6%							R 152 612,14	
					Contingency	10%							R 254 353,57	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 406 965,70**	
					GRAND-TOTAL								**R 2 950 501,36**	

Mokala Manganese Mine

EIA - Financial Provision FY2021

GENERAL ASPECTS							Closure Forecast						2023	Year 3
5,1	GENERAL SURFACES													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1		6	2021	Proposed ROM and Product Stockpile Expansion										
2				Import growthmedium from local topsoil stockpile	Load and haul 1km		Yes	9.6.1	55720,00	m³	R 31,46	R 1 752 951,20	R 1 752 951,20	Topsoil placement 400mm thick
3				Rip footprint area	Ripping of areas to alleviate compaction		Yes	9.5.1	13,93	ha	R 14 659,31	R 204 204,19	R 204 204,19	
4				Establish vetegation	Establishment of vegetation on WRD and tailings dams		Yes	10.4.2	13,93	ha	R 38 370,99	R 534 507,88	R 534 507,88	Includes soil amelioration, cultivation and seeding actions
5														
6		7	2021	Proposed Top Up Stockpile										
7				Import growthmedium from local topsoil stockpile	Load and haul 1km		Yes	9.6.1	1160,00	m³	R 31,46	R 36 493,60	R 36 493,60	Topsoil placement 400mm thick
8				Rip footprint area	Ripping of areas to alleviate compaction		Yes	9.5.1	0,29	ha	R 14 659,31	R 4 251,20	R 4 251,20	
9				Establish vetegation	Establishment of vegetation on WRD and tailings dams		Yes	10.4.2	0,29	ha	R 38 370,99	R 11 127,59	R 11 127,59	Includes soil amelioration, cultivation and seeding actions
					SUB-TOTAL 1								**R 2 543 535,65**	
					Preliminaries and General	6%							R 152 612,14	
					Contingency	10%							R 254 353,57	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 406 965,70**	
					GRAND-TOTAL								**R 2 950 501,36**	

Mokala Manganese Mine

EIA - Financial Provision FY2021

GENERAL ASPECTS								Closure Forecast						2024	Year 4
5,1	GENERAL SURFACES														
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total		LIABLE VALUE	Notes
1		6	2021	Proposed ROM and Product Stockpile Expansion											
2				Import growthmedium from local topsoil stockpile	Load and haul 1km		Yes	9.6.1	55720,00	m³	R 31,46	R	1 752 951,20	R 1 752 951,20	Topsoil placement 400mm thick
3				Rip footprint area	Ripping of areas to alleviate compaction		Yes	9.5.1	13,93	ha	R 14 659,31	R	204 204,19	R 204 204,19	
4				Establish vetegation	Establishment of vegetation on WRD and tailings dams		Yes	10.4.2	13,93	ha	R 38 370,99	R	534 507,88	R 534 507,88	Includes soil amelioration, cultivation and seeding actions
5															
6		7	2021	Proposed Top Up Stockpile											
7				Import growthmedium from local topsoil stockpile	Load and haul 1km		Yes	9.6.1	1160,00	m³	R 31,46	R	36 493,60	R 36 493,60	Topsoil placement 400mm thick
8				Rip footprint area	Ripping of areas to alleviate compaction		Yes	9.5.1	0,29	ha	R 14 659,31	R	4 251,20	R 4 251,20	
9				Establish vetegation	Establishment of vegetation on WRD and tailings dams		Yes	10.4.2	0,29	ha	R 38 370,99	R	11 127,59	R 11 127,59	Includes soil amelioration, cultivation and seeding actions
					SUB-TOTAL 1									**R 2 543 535,65**	
					Preliminaries and General	6%								R 152 612,14	
					Contingency	10%								R 254 353,57	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)									**R 406 965,70**	
					GRAND-TOTAL									**R 2 950 501,36**	

Mokala Manganese Mine

EIA - Financial Provision FY2021

GENERAL ASPECTS							Closure Forecast						2025	Year 5
5,1	GENERAL SURFACES													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1		6	2021	Proposed ROM and Product Stockpile Expansion										
2				Import growthmedium from local topsoil stockpile	Load and haul 1km		Yes	9.6.1	55720,00	m³	R 31,46	R 1 752 951,20	R 1 752 951,20	Topsoil placement 400mm thick
3				Rip footprint area	Ripping of areas to alleviate compaction		Yes	9.5.1	13,93	ha	R 14 659,31	R 204 204,19	R 204 204,19	
4				Establish vetegation	Establishment of vegetation on WRD and tailings dams		Yes	10.4.2	13,93	ha	R 38 370,99	R 534 507,88	R 534 507,88	Includes soil amelioration, cultivation and seeding actions
5														
6		7	2021	Proposed Top Up Stockpile										
7				Import growthmedium from local topsoil stockpile	Load and haul 1km		Yes	9.6.1	1160,00	m³	R 31,46	R 36 493,60	R 36 493,60	Topsoil placement 400mm thick
8				Rip footprint area	Ripping of areas to alleviate compaction		Yes	9.5.1	0,29	ha	R 14 659,31	R 4 251,20	R 4 251,20	
9				Establish vetegation	Establishment of vegetation on WRD and tailings dams		Yes	10.4.2	0,29	ha	R 38 370,99	R 11 127,59	R 11 127,59	Includes soil amelioration, cultivation and seeding actions
					SUB-TOTAL 1								**R 2 543 535,65**	
					Preliminaries and General	6%							R 152 612,14	
					Contingency	10%							R 254 353,57	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 406 965,70**	
					GRAND-TOTAL								**R 2 950 501,36**	

Mokala Manganese Mine

EIA - Financial Provision FY2021

GENERAL ASPECTS								Closure Forecast						2026	Year 6
5,1	GENERAL SURFACES														
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total		LIABLE VALUE	Notes
1		6	2021	Proposed ROM and Product Stockpile Expansion											
2				Import growthmedium from local topsoil stockpile	Load and haul 1km		Yes	9.6.1	55720,00	m³	R 31,46	R	1 752 951,20	R 1 752 951,20	Topsoil placement 400mm thick
3				Rip footprint area	Ripping of areas to alleviate compaction		Yes	9.5.1	13,93	ha	R 14 659,31	R	204 204,19	R 204 204,19	
4				Establish vetegation	Establishment of vegetation on WRD and tailings dams		Yes	10.4.2	13,93	ha	R 38 370,99	R	534 507,88	R 534 507,88	Includes soil amelioration, cultivation and seeding actions
5															
6		7	2021	Proposed Top Up Stockpile											
7				Import growthmedium from local topsoil stockpile	Load and haul 1km		Yes	9.6.1	1160,00	m³	R 31,46	R	36 493,60	R 36 493,60	Topsoil placement 400mm thick
8				Rip footprint area	Ripping of areas to alleviate compaction		Yes	9.5.1	0,29	ha	R 14 659,31	R	4 251,20	R 4 251,20	
9				Establish vetegation	Establishment of vegetation on WRD and tailings dams		Yes	10.4.2	0,29	ha	R 38 370,99	R	11 127,59	R 11 127,59	Includes soil amelioration, cultivation and seeding actions
					SUB-TOTAL 1									**R 2 543 535,65**	
					Preliminaries and General	6%								R 152 612,14	
					Contingency	10%								R 254 353,57	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)									**R 406 965,70**	
					GRAND-TOTAL									**R 2 950 501,36**	

Mokala Manganese Mine

EIA - Financial Provision FY2021

GENERAL ASPECTS							Closure Forecast						2027	Year 7
5,1	GENERAL SURFACES													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1		6	2021	Proposed ROM and Product Stockpile Expansion										
2				Import growthmedium from local topsoil stockpile	Load and haul 1km		Yes	9.6.1	55720,00	m³	R 31,46	R 1 752 951,20	R 1 752 951,20	Topsoil placement 400mm thick
3				Rip footprint area	Ripping of areas to alleviate compaction		Yes	9.5.1	13,93	ha	R 14 659,31	R 204 204,19	R 204 204,19	
4				Establish vetegation	Establishment of vegetation on WRD and tailings dams		Yes	10.4.2	13,93	ha	R 38 370,99	R 534 507,88	R 534 507,88	Includes soil amelioration, cultivation and seeding actions
5														
6		7	2021	Proposed Top Up Stockpile										
7				Import growthmedium from local topsoil stockpile	Load and haul 1km		Yes	9.6.1	1160,00	m³	R 31,46	R 36 493,60	R 36 493,60	Topsoil placement 400mm thick
8				Rip footprint area	Ripping of areas to alleviate compaction		Yes	9.5.1	0,29	ha	R 14 659,31	R 4 251,20	R 4 251,20	
9				Establish vetegation	Establishment of vegetation on WRD and tailings dams		Yes	10.4.2	0,29	ha	R 38 370,99	R 11 127,59	R 11 127,59	Includes soil amelioration, cultivation and seeding actions
					SUB-TOTAL 1								**R 2 543 535,65**	
					Preliminaries and General	6%							R 152 612,14	
					Contingency	10%							R 254 353,57	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 406 965,70**	
					GRAND-TOTAL								**R 2 950 501,36**	

Mokala Manganese Mine

EIA - Financial Provision FY2021

GENERAL ASPECTS							Closure Forecast						2028	Year 8
5,1	GENERAL SURFACES													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1		6	2021	Proposed ROM and Product Stockpile Expansion										
2				Import growthmedium from local topsoil stockpile	Load and haul 1km		Yes	9.6.1	55720,00	m³	R 31,46	R 1 752 951,20	R 1 752 951,20	Topsoil placement 400mm thick
3				Rip footprint area	Ripping of areas to alleviate compaction		Yes	9.5.1	13,93	ha	R 14 659,31	R 204 204,19	R 204 204,19	
4				Establish vetegation	Establishment of vegetation on WRD and tailings dams		Yes	10.4.2	13,93	ha	R 38 370,99	R 534 507,88	R 534 507,88	Includes soil amelioration, cultivation and seeding actions
5														
6		7	2021	Proposed Top Up Stockpile										
7				Import growthmedium from local topsoil stockpile	Load and haul 1km		Yes	9.6.1	1160,00	m³	R 31,46	R 36 493,60	R 36 493,60	Topsoil placement 400mm thick
8				Rip footprint area	Ripping of areas to alleviate compaction		Yes	9.5.1	0,29	ha	R 14 659,31	R 4 251,20	R 4 251,20	
9				Establish vetegation	Establishment of vegetation on WRD and tailings dams		Yes	10.4.2	0,29	ha	R 38 370,99	R 11 127,59	R 11 127,59	Includes soil amelioration, cultivation and seeding actions
					SUB-TOTAL 1								**R 2 543 535,65**	
					Preliminaries and General	6%							R 152 612,14	
					Contingency	10%							R 254 353,57	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 406 965,70**	
					GRAND-TOTAL								**R 2 950 501,36**	

Mokala Manganese Mine

EIA - Financial Provision FY2021

GENERAL ASPECTS							Closure Forecast						2029	Year 9
5,1	GENERAL SURFACES													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1		6	2021	Proposed ROM and Product Stockpile Expansion										
2				Import growthmedium from local topsoil stockpile	Load and haul 1km		Yes	9.6.1	55720,00	m³	R 31,46	R 1 752 951,20	R 1 752 951,20	Topsoil placement 400mm thick
3				Rip footprint area	Ripping of areas to alleviate compaction		Yes	9.5.1	13,93	ha	R 14 659,31	R 204 204,19	R 204 204,19	
4				Establish vetegation	Establishment of vegetation on WRD and tailings dams		Yes	10.4.2	13,93	ha	R 38 370,99	R 534 507,88	R 534 507,88	Includes soil amelioration, cultivation and seeding actions
5														
6		7	2021	Proposed Top Up Stockpile										
7				Import growthmedium from local topsoil stockpile	Load and haul 1km		Yes	9.6.1	1160,00	m³	R 31,46	R 36 493,60	R 36 493,60	Topsoil placement 400mm thick
8				Rip footprint area	Ripping of areas to alleviate compaction		Yes	9.5.1	0,29	ha	R 14 659,31	R 4 251,20	R 4 251,20	
9				Establish vetegation	Establishment of vegetation on WRD and tailings dams		Yes	10.4.2	0,29	ha	R 38 370,99	R 11 127,59	R 11 127,59	Includes soil amelioration, cultivation and seeding actions
					SUB-TOTAL 1								**R 2 543 535,65**	
					Preliminaries and General	6%							R 152 612,14	
					Contingency	10%							R 254 353,57	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 406 965,70**	
					GRAND-TOTAL								**R 2 950 501,36**	

Mokala Manganese Mine

EIA - Financial Provision FY2021

GENERAL ASPECTS							Closure Forecast						2030	Year 10
5,1	GENERAL SURFACES													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1		6	2021	Proposed ROM and Product Stockpile Expansion										
2				Import growthmedium from local topsoil stockpile	Load and haul 1km		Yes	9.6.1	55720,00	m³	R 31,46	R 1 752 951,20	R 1 752 951,20	Topsoil placement 400mm thick
3				Rip footprint area	Ripping of areas to alleviate compaction		Yes	9.5.1	13,93	ha	R 14 659,31	R 204 204,19	R 204 204,19	
4				Establish vetegation	Establishment of vegetation on WRD and tailings dams		Yes	10.4.2	13,93	ha	R 38 370,99	R 534 507,88	R 534 507,88	Includes soil amelioration, cultivation and seeding actions
5														
6		7	2021	Proposed Top Up Stockpile										
7				Import growthmedium from local topsoil stockpile	Load and haul 1km		Yes	9.6.1	1160,00	m³	R 31,46	R 36 493,60	R 36 493,60	Topsoil placement 400mm thick
8				Rip footprint area	Ripping of areas to alleviate compaction		Yes	9.5.1	0,29	ha	R 14 659,31	R 4 251,20	R 4 251,20	
9				Establish vetegation	Establishment of vegetation on WRD and tailings dams		Yes	10.4.2	0,29	ha	R 38 370,99	R 11 127,59	R 11 127,59	Includes soil amelioration, cultivation and seeding actions
					SUB-TOTAL 1								**R 2 543 535,65**	
					Preliminaries and General	6%							R 152 612,14	
					Contingency	10%							R 254 353,57	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 406 965,70**	
					GRAND-TOTAL								**R 2 950 501,36**	

Mokala Manganese Mine

EIA - Financial Provision FY2021

GENERAL ASPECTS							Premature Closure						2021	Year 1
5,2	POST CLOSURE MONITORING AND MAINTENANCE													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1			2021	Environmental Monitoring	Surface water Quality		Yes	12.1.1	0,00	yr	R 40 967,00	R -	R -	No additional monitoring points required
2			2021	Environmental Monitoring	Groundwater Quality		Yes	12.1.2	0,00	yr	R 48 407,00	R -	R -	No additional monitoring points required
3			2021	Environmental Monitoring	Air Quality		Yes	12.1.3	0,00	yr	R 53 833,36	R -	R -	No additional monitoring points required
4			2021	Environmental Monitoring	Vegetation (rehabilitation) Monitoring		Yes	12.1.8	1,00	yr	R 179 655,30	R 179 655,30	R 179 655,30	No additional monitoring required as part of expansion project
5			2021	Environmental Monitoring	Biodiversity and ecological functioning		Yes	12.1.9	1,00	yr	R 179 655,30	R 179 655,30	R 179 655,30	No additional monitoring required as part of expansion project
6			2021	Post Closure	Care and maintenance		Yes	12.2.1	66,77	ha	R 8 067,74	R 538 683,00	R 538 683,00	5 years care and maintenance.
					SUB-TOTAL 1								**R 897 993,60**	
					Preliminaries and General	6%							R 53 879,62	
					Contingency	10%							R 89 799,36	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 143 678,98**	
					GRAND-TOTAL								**R 1 041 672,58**	

Mokala Manganese Mine

EIA - Financial Provision FY2021

GENERAL ASPECTS							Closure Forecast						2022	Year 2
5,2	POST CLOSURE MONITORING AND MAINTENANCE													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1			2021	Environmental Monitoring	Surface water Quality		Yes	12.1.1	0,00	yr	R 40 967,00	R -	R -	No additional monitoring points required
2			2021	Environmental Monitoring	Groundwater Quality		Yes	12.1.2	0,00	yr	R 48 407,00	R -	R -	No additional monitoring points required
3			2021	Environmental Monitoring	Air Quality		Yes	12.1.3	0,00	yr	R 53 833,36	R -	R -	No additional monitoring points required
4			2021	Environmental Monitoring	Vegetation (rehabilitation) Monitoring		Yes	12.1.8	1,00	yr	R 179 655,30	R 179 655,30	R 179 655,30	No additional monitoring required as part of expansion project
5			2021	Environmental Monitoring	Biodiversity and ecological functioning		Yes	12.1.9	1,00	yr	R 179 655,30	R 179 655,30	R 179 655,30	No additional monitoring required as part of expansion project
6			2021	Post Closure	Care and maintenance		Yes	12.2.1	65,57	ha	R 8 067,74	R 529 001,71	R 529 001,71	5 years care and maintenance.
					SUB-TOTAL 1								**R 888 312,31**	
					Preliminaries and General	6%							R 53 298,74	
					Contingency	10%							R 88 831,23	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 142 129,97**	
					GRAND-TOTAL								**R 1 030 442,28**	

Mokala Manganese Mine

EIA - Financial Provision FY2021

GENERAL ASPECTS							Closure Forecast						2023	Year 3
5,2	POST CLOSURE MONITORING AND MAINTENANCE													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1			2021	Environmental Monitoring	Surface water Quality		Yes	12.1.1	0,00	yr	R 40 967,00	R -	R -	No additional monitoring points required
2			2021	Environmental Monitoring	Groundwater Quality		Yes	12.1.2	0,00	yr	R 48 407,00	R -	R -	No additional monitoring points required
3			2021	Environmental Monitoring	Air Quality		Yes	12.1.3	0,00	yr	R 53 833,36	R -	R -	No additional monitoring points required
4			2021	Environmental Monitoring	Vegetation (rehabilitation) Monitoring		Yes	12.1.8	1,00	yr	R 179 655,30	R 179 655,30	R 179 655,30	No additional monitoring required as part of expansion project
5			2021	Environmental Monitoring	Biodiversity and ecological functioning		Yes	12.1.9	1,00	yr	R 179 655,30	R 179 655,30	R 179 655,30	No additional monitoring required as part of expansion project
6			2021	Post Closure	Care and maintenance		Yes	12.2.1	83,02	ha	R 8 067,74	R 669 783,77	R 669 783,77	5 years care and maintenance.
					SUB-TOTAL 1								**R 1 029 094,37**	
					Preliminaries and General	6%							R 61 745,66	
					Contingency	10%							R 102 909,44	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 164 655,10**	
					GRAND-TOTAL								**R 1 193 749,47**	

Mokala Manganese Mine

EIA - Financial Provision FY2021

GENERAL ASPECTS							Closure Forecast						2024	Year 4
5,2	POST CLOSURE MONITORING AND MAINTENANCE													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1			2021	Environmental Monitoring	Surface water Quality		Yes	12.1.1	0,00	yr	R 40 967,00	R -	R -	No additional monitoring points required
2			2021	Environmental Monitoring	Groundwater Quality		Yes	12.1.2	0,00	yr	R 48 407,00	R -	R -	No additional monitoring points required
3			2021	Environmental Monitoring	Air Quality		Yes	12.1.3	0,00	yr	R 53 833,36	R -	R -	No additional monitoring points required
4			2021	Environmental Monitoring	Vegetation (rehabilitation) Monitoring		Yes	12.1.8	1,00	yr	R 179 655,30	R 179 655,30	R 179 655,30	No additional monitoring required as part of expansion project
5			2021	Environmental Monitoring	Biodiversity and ecological functioning		Yes	12.1.9	1,00	yr	R 179 655,30	R 179 655,30	R 179 655,30	No additional monitoring required as part of expansion project
6			2021	Post Closure	Care and maintenance		Yes	12.2.1	148,88	ha	R 8 067,74	R 1 201 125,13	R 1 201 125,13	5 years care and maintenance.
					SUB-TOTAL 1								**R 1 560 435,73**	
					Preliminaries and General	6%							R 93 626,14	
					Contingency	10%							R 156 043,57	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 249 669,72**	
					GRAND-TOTAL								**R 1 810 105,45**	

Mokala Manganese Mine

EIA - Financial Provision FY2021

GENERAL ASPECTS							Closure Forecast						2025	Year 5
5,2	POST CLOSURE MONITORING AND MAINTENANCE													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1			2021	Environmental Monitoring	Surface water Quality		Yes	12.1.1	0,00	yr	R 40 967,00	R -	R -	No additional monitoring points required
2			2021	Environmental Monitoring	Groundwater Quality		Yes	12.1.2	0,00	yr	R 48 407,00	R -	R -	No additional monitoring points required
3			2021	Environmental Monitoring	Air Quality		Yes	12.1.3	0,00	yr	R 53 833,36	R -	R -	No additional monitoring points required
4			2021	Environmental Monitoring	Vegetation (rehabilitation) Monitoring		Yes	12.1.8	1,00	yr	R 179 655,30	R 179 655,30	R 179 655,30	No additional monitoring required as part of expansion project
5			2021	Environmental Monitoring	Biodiversity and ecological functioning		Yes	12.1.9	1,00	yr	R 179 655,30	R 179 655,30	R 179 655,30	No additional monitoring required as part of expansion project
6			2021	Post Closure	Care and maintenance		Yes	12.2.1	166,44	ha	R 8 067,74	R 1 342 794,65	R 1 342 794,65	5 years care and maintenance.
					SUB-TOTAL 1								**R 1 702 105,25**	
					Preliminaries and General	6%							R 102 126,31	
					Contingency	10%							R 170 210,52	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 272 336,84**	
					GRAND-TOTAL								**R 1 974 442,08**	

Mokala Manganese Mine

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GENERAL ASPECTS							Closure Forecast						2026	Year 6
5,2	POST CLOSURE MONITORING AND MAINTENANCE													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1			2021	Environmental Monitoring	Surface water Quality		Yes	12.1.1	0,00	yr	R 40 967,00	R -	R -	No additional monitoring points required
2			2021	Environmental Monitoring	Groundwater Quality		Yes	12.1.2	0,00	yr	R 48 407,00	R -	R -	No additional monitoring points required
3			2021	Environmental Monitoring	Air Quality		Yes	12.1.3	0,00	yr	R 53 833,36	R -	R -	No additional monitoring points required
4			2021	Environmental Monitoring	Vegetation (rehabilitation) Monitoring		Yes	12.1.8	1,00	yr	R 179 655,30	R 179 655,30	R 179 655,30	No additional monitoring required as part of expansion project
5			2021	Environmental Monitoring	Biodiversity and ecological functioning		Yes	12.1.9	1,00	yr	R 179 655,30	R 179 655,30	R 179 655,30	No additional monitoring required as part of expansion project
6			2021	Post Closure	Care and maintenance		Yes	12.2.1	176,52	ha	R 8 067,74	R 1 424 117,46	R 1 424 117,46	5 years care and maintenance.
					SUB-TOTAL 1								**R 1 783 428,06**	
					Preliminaries and General	6%							R 107 005,68	
					Contingency	10%							R 178 342,81	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 285 348,49**	
					GRAND-TOTAL								**R 2 068 776,56**	

Mokala Manganese Mine

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GENERAL ASPECTS							Closure Forecast						2027	Year 7
5,2	POST CLOSURE MONITORING AND MAINTENANCE													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1			2021	Environmental Monitoring	Surface water Quality		Yes	12.1.1	0,00	yr	R 40 967,00	R -	R -	No additional monitoring points required
2			2021	Environmental Monitoring	Groundwater Quality		Yes	12.1.2	0,00	yr	R 48 407,00	R -	R -	No additional monitoring points required
3			2021	Environmental Monitoring	Air Quality		Yes	12.1.3	0,00	yr	R 53 833,36	R -	R -	No additional monitoring points required
4			2021	Environmental Monitoring	Vegetation (rehabilitation) Monitoring		Yes	12.1.8	1,00	yr	R 179 655,30	R 179 655,30	R 179 655,30	No additional monitoring required as part of expansion project
5			2021	Environmental Monitoring	Biodiversity and ecological functioning		Yes	12.1.9	1,00	yr	R 179 655,30	R 179 655,30	R 179 655,30	No additional monitoring required as part of expansion project
6			2021	Post Closure	Care and maintenance		Yes	12.2.1	171,12	ha	R 8 067,74	R 1 380 551,67	R 1 380 551,67	5 years care and maintenance.
					SUB-TOTAL 1								**R 1 739 862,27**	
					Preliminaries and General	6%							R 104 391,74	
					Contingency	10%							R 173 986,23	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 278 377,96**	
					GRAND-TOTAL								**R 2 018 240,23**	

Mokala Manganese Mine

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GENERAL ASPECTS							Closure Forecast						2028	Year 8
5,2	POST CLOSURE MONITORING AND MAINTENANCE													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1			2021	Environmental Monitoring	Surface water Quality		Yes	12.1.1	0,00	yr	R 40 967,00	R -	R -	No additional monitoring points required
2			2021	Environmental Monitoring	Groundwater Quality		Yes	12.1.2	0,00	yr	R 48 407,00	R -	R -	No additional monitoring points required
3			2021	Environmental Monitoring	Air Quality		Yes	12.1.3	0,00	yr	R 53 833,36	R -	R -	No additional monitoring points required
4			2021	Environmental Monitoring	Vegetation (rehabilitation) Monitoring		Yes	12.1.8	1,00	yr	R 179 655,30	R 179 655,30	R 179 655,30	No additional monitoring required as part of expansion project
5			2021	Environmental Monitoring	Biodiversity and ecological functioning		Yes	12.1.9	1,00	yr	R 179 655,30	R 179 655,30	R 179 655,30	No additional monitoring required as part of expansion project
6			2021	Post Closure	Care and maintenance		Yes	12.2.1	176,11	ha	R 8 067,74	R 1 420 809,69	R 1 420 809,69	5 years care and maintenance.
					SUB-TOTAL 1								**R 1 780 120,29**	
					Preliminaries and General	6%							R 106 807,22	
					Contingency	10%							R 178 012,03	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 284 819,25**	
					GRAND-TOTAL								**R 2 064 939,54**	

Mokala Manganese Mine

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GENERAL ASPECTS							Closure Forecast						2029	Year 9
5,2	POST CLOSURE MONITORING AND MAINTENANCE													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1			2021	Environmental Monitoring	Surface water Quality		Yes	12.1.1	0,00	yr	R 40 967,00	R -	R -	No additional monitoring points required
2			2021	Environmental Monitoring	Groundwater Quality		Yes	12.1.2	0,00	yr	R 48 407,00	R -	R -	No additional monitoring points required
3			2021	Environmental Monitoring	Air Quality		Yes	12.1.3	0,00	yr	R 53 833,36	R -	R -	No additional monitoring points required
4			2021	Environmental Monitoring	Vegetation (rehabilitation) Monitoring		Yes	12.1.8	1,00	yr	R 179 655,30	R 179 655,30	R 179 655,30	No additional monitoring required as part of expansion project
5			2021	Environmental Monitoring	Biodiversity and ecological functioning		Yes	12.1.9	1,00	yr	R 179 655,30	R 179 655,30	R 179 655,30	No additional monitoring required as part of expansion project
6			2021	Post Closure	Care and maintenance		Yes	12.2.1	182,48	ha	R 8 067,74	R 1 472 201,20	R 1 472 201,20	5 years care and maintenance.
					SUB-TOTAL 1								**R 1 831 511,80**	
					Preliminaries and General	6%							R 109 890,71	
					Contingency	10%							R 183 151,18	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 293 041,89**	
					GRAND-TOTAL								**R 2 124 553,68**	

Mokala Manganese Mine

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GENERAL ASPECTS							Closure Forecast						2030	Year 10
5,2	POST CLOSURE MONITORING AND MAINTENANCE													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1			2021	Environmental Monitoring	Surface water Quality		Yes	12.1.1	0,00	yr	R 40 967,00	R -	R -	No additional monitoring points required
2			2021	Environmental Monitoring	Groundwater Quality		Yes	12.1.2	0,00	yr	R 48 407,00	R -	R -	No additional monitoring points required
3			2021	Environmental Monitoring	Air Quality		Yes	12.1.3	0,00	yr	R 53 833,36	R -	R -	No additional monitoring points required
4			2021	Environmental Monitoring	Vegetation (rehabilitation) Monitoring		Yes	12.1.8	1,00	yr	R 179 655,30	R 179 655,30	R 179 655,30	No additional monitoring required as part of expansion project
5			2021	Environmental Monitoring	Biodiversity and ecological functioning		Yes	12.1.9	1,00	yr	R 179 655,30	R 179 655,30	R 179 655,30	No additional monitoring required as part of expansion project
6			2021	Post Closure	Care and maintenance		Yes	12.2.1	174,59	ha	R 8 067,74	R 1 408 546,73	R 1 408 546,73	5 years care and maintenance.
					SUB-TOTAL 1								**R 1 767 857,33**	
					Preliminaries and General	6%							R 106 071,44	
					Contingency	10%							R 176 785,73	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 282 857,17**	
					GRAND-TOTAL								**R 2 050 714,50**	