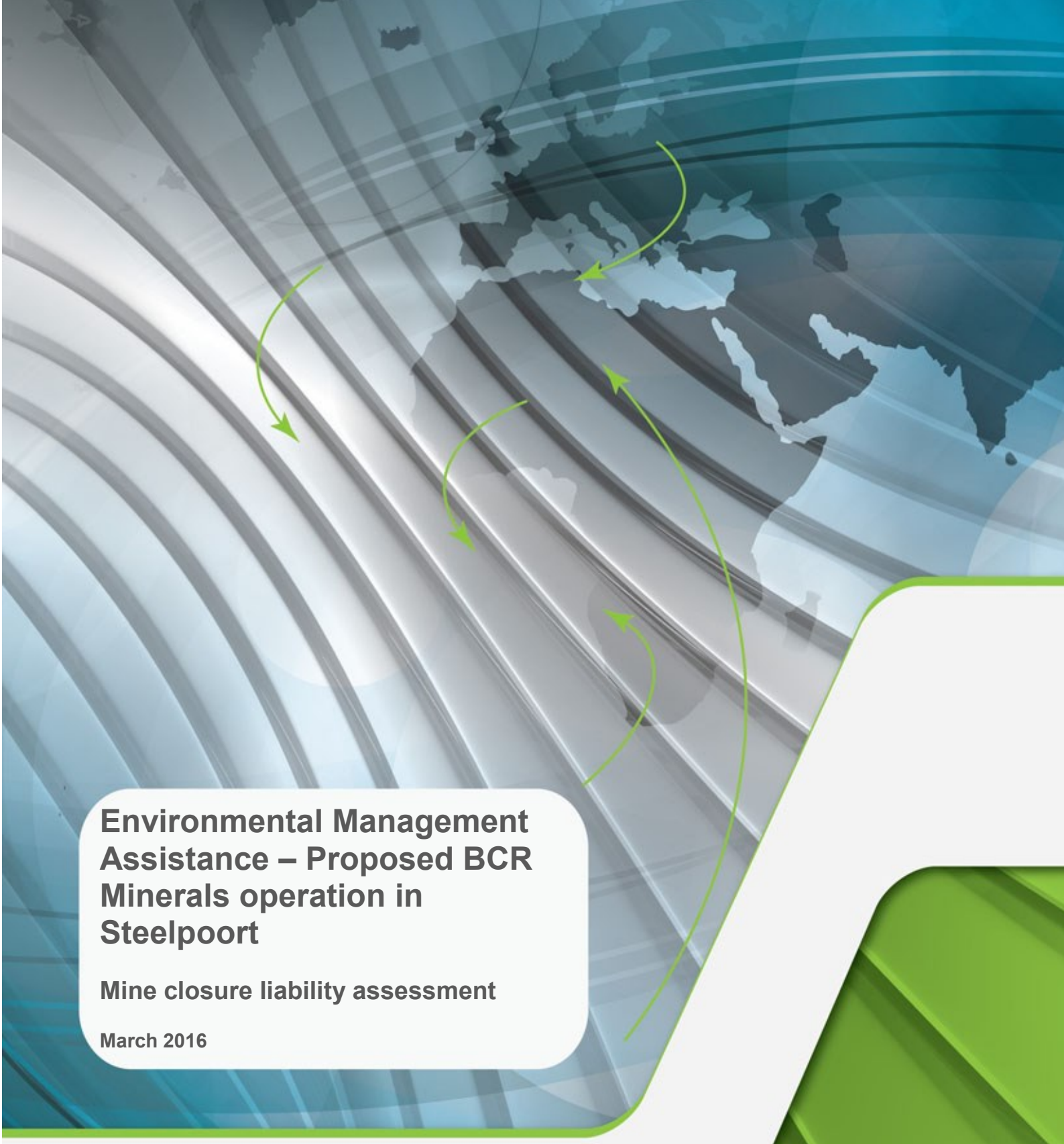

Environmental Management Assistance – Proposed BCR Minerals operation in Steelpoort

Mine closure liability assessment

March 2016

SHANGONI
Management Services (Pty) Ltd

www.shangoni.co.za

MINE CLOSURE COST ASSESSMENT REPORT

Environmental Management Assistance – Proposed BCR Minerals operation in Steelpoort

Mine closure liability assessment

March 2016

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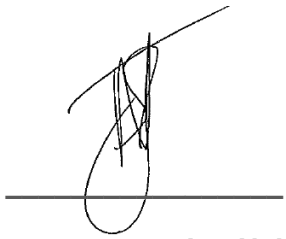
Management Services (Pty) Ltd

PROJECT DETAILS

Department of Mineral Resources

Project Title:	**Mine closure liability assessment**
Project Number:	**EMA-STE-15-12-02**
Compiled by:	**Anika van Vuuren**
Date:	**March 2016**
Location:	**Steelpoort, Limpopo**
Technical Reviewer:	**Jan Nel**



Jan Nel

EXECUTIVE SUMMARY

This closure liability assessment forms part of Bushveld Chrome Resources Minerals' Environmental Impact Assessment and Environmental Management Programme. The purpose of this document is to supply the Department of Mineral Resources (DMR) with the requested information pertaining to closure cost at Bushveld Chrome Resources (Pty) Ltd, as required by the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA) and the Mineral and Petroleum Resource Development Act, (Act 28 of 20025) (MPRDA). The contents of this financial provisioning report are based on the requirements as stipulated under Government Notice Regulations 1147.

An assessment was conducted of all the infrastructure and activities taking place on site that fall within the responsibility of Bushveld Chrome Resources. The infrastructure was classified in accordance with the tariffs list and the surface areas of the infrastructure were calculated to determine the volume or surface requiring rehabilitation or demolition. A separate calculation was done to include the costs associated with Phase 1 (including laydown area 1, Klarinet Koppie opencast pit and the associated ROM stockpiles). A supplementary calculation was done to incorporate Phase 2 & 3 and a second laydown area. These extensions are planned as part of the next phases of the project and will only commence once phase 1 mining operations have ceased. A detailed quantum calculation is attached as Appendix 1.

The premature quantum was calculated using the demolition and rehabilitation rates and has been calculated as **R 6 140 648.41 (including P&G, contingency and excluding VAT)** for the physical and biophysical components associated with the current activities and infrastructure on the site (Table 1)**.** This is related to Open pit 1, Laydown area 1, Ore stockpile area, ROM stockpile area and roads.

Table 1: Summary of the calculated quantum closure costs for premature closure

Component	Cost
Physical components	R 0.00
Biophysical components	R6 140 648.41
Total Closure cost	**R6 140 648.41**

The biophysical component of rehabilitation makes for 100% of the liability cost. A focussed rehabilitation and closure strategy can minimise the liability of the biophysical component. The physical rehabilitation (demolition and removal of structures) amounts to 0% of the liability cost. For the reason that all infrastructure will either be removed off site by the mining contractor or be taken over by the community. Therefore, the biophysical component contributes solely to the calculated closure costs for premature closure.

The community have expressed an interest in some of the physical infrastructure, such as some of the laydown area buildings, the access and haul roads as well as the ROM stockpile's footprints for future use.

A cost estimate has been included for the current and future activities. The assumption made with regards to placement of waste rock in the future activities is that a starter waste rock dump will be constructed and as soon as mining allows it, the waste rock will be backfilled into the pit area. This will be done as part of operational cost. Thus no waste rock dumps will remain subsequent to mining operations ceasing.

The quantum calculated for all activities and infrastructure associated with the entire Spitsvale Project (including mining of phase 2 and 3 and the associated infrastructure) was calculated as **R 8 699 326.49** (including P&G, contingency and excluding VAT). The increase in biophysical costs (between the current and proposed costs) can be attributed to the addition of two opencast pits, with their associated infrastructure, in the future. All physical infrastructure to be constructed in the future will also be either removed upon closure by the mining contractor or given to the community.

The costing sheets have been reviewed externally by a registered financial institution for correctness regarding the calculations. Based on the current information it is estimated that the accuracy level of the phase 1 calculation is 95% and the accuracy level of the calculation of the future mining development is 50%.

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Environmental Management Assistance. 2016. Environmental impact assessment report and environmental management programme report for the Spitsvale mining right application and associated activities DMR Ref: LP 30/5/1/2/3/2/1 (10104).

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DEFINITIONS

Environment

The surroundings (biophysical, social and economic) within which humans exist and that are made up of

- the land, water and atmosphere of the earth;
- micro-organisms, plant and animal life;
- any part or combination of (i) and (ii) and the interrelationships among and between them; and
- the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing.

Environmental Impacts

Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's activities, products or services.

Financial Provision

The insurance, bank guarantee, trust fund or cash that applicants for an environmental authorisation must provide in terms of this Act guaranteeing the availability of sufficient funds to undertake the-

(a) rehabilitation of the adverse environmental impacts of the listed or specified activities;
(b) rehabilitation of the impacts of the prospecting, exploration, mining or production activities, including the pumping and treatment of polluted or extraneous water;
(c) decommissioning and closure of the operations;
(d) remediation of latent or residual environmental impacts which become known in the future;
(e) removal of building structures and other objects; or
(f) remediation of any other negative environmental impacts;

Land use

The various ways in which land may be employed or occupied. Planners compile, classify, study and analyse land use data for many purposes, including the identification of trends, the forecasting of space and infrastructure requirements, the provision of adequate land area for necessary types of land use, and the development or revision of comprehensive plans and land use regulations.

Pollution

means any change in the environment caused by -

(i) substances;

(ii) radioactive or other waves; or

(iii) noise, odours, dust or heat,

emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, whether engaged in by any person or an organ of state, where that change has an adverse effect on human health or wellbeing or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future.

Pollution Prevention

Any activity that reduces or eliminates pollutants prior to recycling, treatment, control or disposal.

Topography

Topography, a term in geography, refers to the "lay of the land" or the physio-geographic characteristics of land in terms of elevation, slope and orientation.

Vegetation

All of the plants growing in and characterizing a specific area or region; the combination of different plant communities found there.

Waste

As per the definition of the National Environmental Management: Waste Amendment Act, 2014 - means (a) any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered and includes all wastes as defined in Schedule 3 to the Act; or

(b) any other substance, material or object that is not included in Schedule 3 that may be defined as a waste by the Minister by notice in the *Gazette*, but any waste or portion of waste, referred to in paragraphs *(a)* and *(b)*, ceases to be a waste:

(i) once an application for its re-use, recycling or recovery has been approved or, after such approval, once it is, or has been re-used, recycled or recovered;

(ii) where approval is not required, once a waste is, or has been re-used, recycled or recovered;

(iii) where the Minister has, in terms of section 74, exempted any waste or a portion of waste generated by a particular process from the definition of waste; or

(iv) where the Minister has, in the prescribed manner, excluded any waste stream or a portion of a waste stream from the definition of waste.

ABBREVIATIONS

BCR - Bushveld Chrome Resources
BoQ - Bill of Quantities
DMR - Department of Mineral Resources
EMA - Environmental Management Assistance
EMP - Environmental Management Programme
LOM - Life of Mine
MPRDA - Mineral and Petroleum Resource Development Act
NEMA - National Environmental Management Act
SAHRA - South African Heritage Resources Agency

1. INTRODUCTION

Bushveld Chrome Resources Minerals (Pty) Ltd (hereafter referred to as BCR Minerals) contracted Environmental Management Assistance (hereafter referred to as EMA) as the independent EAP for the mining right application and associated activities. Environmental Management Assistance requested Shangoni Management Services to determine the financial liability related to closure and rehabilitation for the proposed BCR Minerals mining site located in Steelpoort, Limpopo.

This report provides the necessary information to support the calculations of the closure cost assessments as detailed in Appendix 1. A detailed assessment was conducted of all the infrastructure and activities taking place on site that fall within the area of responsibility of BCR Minerals (Pty) Ltd.

1.1 Appointed reviewer

Name of firm	Shangoni Management Services	
Postal address	P.O. Box 74726 Lynnwood Ridge 0040	
Telephone No.	(012) 807 7036	
Fax	(012) 807 1014	
E-mail	anika@shangoni.co.za	
Team of Environmental Assessment Practitioners on project		
Name	Qualifications	Responsibility
Jan Nel	M.Sc. Env. Man (UFS)	Project Director
Anika van Vuuren	B.Sc. (Hons) Env. Man. (NWU)	Mine closure liability review
Mikhall Eastman	Chartered Accountant CA (SA)	External financial reviewer

1.2 Assumptions

As part of the calculation of the closure cost certain assumptions needs to be made. The assumptions supporting the costing are the following:

- Prior to determining what buildings should be demolished the requirements of section 44 of the Mineral and Petroleum Resource Development Act was considered.
- Current Life of Mine has been calculated on 30 years (as of 2014) and closure will commence once the final stages of ore extractions commence.
- The infrastructure lists were abstracted from information supplied by EMA, which is assumed to be correct.
- The office and buildings will be demolished and rehabilitated if no alternative need can be identified for it at closing**. It is assumed that agreements with the public will be reached in terms of the use of the structures (Refer to Appendix 3). The community have expressed a desire to take over some of the structures, as indicated in the financial provisioning spreadsheet.**
- The Community have requested that the access & haul roads remain present and that stockpile areas 1,2 and 3 be left intact for future cattle kraals.
- Some of the physical structures on site are owned by the mining contractor and will therefore be removed off site once mining ceases. These structures have therefor not been included in the closure cost calculations.
- No allowances have been made for money received from sale of equipment, recyclable materials, structures, vehicles or the hiring out of infrastructure.
- Although no formal contracts have been signed with the local tourism board or municipality the buildings identified in the heritage assessment may not be demolished due to their historical value. Agreements will be negotiated 5 years prior to mine closure. The burial grounds and industrial heritage site identified in heritage assessment may not be demolished and should also be considered in any formal agreements mentioned above.
- Financial Provisioning has been done for all activities and structures associated with phase 1 of the Spitsvale project, i.e. Laydown area 1 as well as Klarinet koppie pit, associated ROM stockpiles and roads.
- Phase 1 & 3 of the operation will use the laydown area associated with Phase 1 (Klarinet koppie), Phase 2 will require the construction of a replica laydown area located near Tubatse Koppie.
- Costing has been provided separately for the proposed laydown area associated with phase 2 of the Spitsvale project (Tubatse koppie), as well as the opencast pits for phase 2 and phase 3.
- If new grave-sites are discovered, this will be communicated between the parties (BCR Minerals and interested and affected parties) to ensure that graves are adequately fenced and not disturbed.
- Monitoring boreholes will remain open for future compliance monitoring.
- A groundwater monitoring programme has not yet been implemented in order to monitor ground water quality and changes in ground water levels both up- and downstream of the proposed opencast mine.

- A surface water monitoring programme has not yet been implemented in order to ascertain the baseline water quality and at a later stage, determine the impact of the mining operations on the surface water quality.
- The rates for steel costing (R 1349 / tonne) has been converted to square meters (0.232 t / m^2).
- The total disturbed surface area at LOM related to the open pits accumulate to 24.25ha. Open pit 1 surface disturbance is currently 5.1ha. The surface disturbance related to existing roads and laydown area 1 is 9.5ha. Thus the current surface disturbance is estimated to be 14.6ha. Future disturbance i.e. addition of laydown area 2, an increase in the size of open Pit 1's surface disturbance (From the current 5.1 ha to include an additional 6.38ha) open pit 2 and open pit 3 would add an additional 19.15ha. This will however only be added to the premature closure costing as the disturbance takes place.
- Future operations (pit 2 and pit 3) will incorporate a concurrent rehabilitation programme whereby mining will take place on a cut and fill basis i.e. the void will be rehabilitated on a continuous basis. Only the final void will be rehabilitated once the resources have been depleted.
- Open pit 1 - backfill costing was calculated with the assumption that the mine will utilise existing equipment.
- Open pit 1 – Volume required for the current backfill of the Phase 1 pit (Klarinet Koppie) was calculated based on **657 503 m^3.**
- Open pit 1 - overburden has been stored in stockpiles close to the pit to be used to backfill the pit.
- Open pit 1 – Surface area of the pit is assumed at 5.1 ha which will extend by an additional 6.34 ha.
- Backfill costing has been estimated for pit backfilling material at R7.12 per cubic meter.
- Stakeholders' expectations for post-closure land use indicate that where possible, an increase in available grazing should receive priority.
- Stakeholders' expectations for rehabilitation and post-closure was seen as an opportunity for community members wanting to generate an additional income – they could start experimenting with raising some of the trees commonly found on the slopes to then sell to the mining community (not just BCR) as part of their rehabilitation efforts.
- All ore stockpiles are product, it is assumed that on closure (either pre-mature or LOM) the product will be sold and the footprint area will be rehabilitated (ripped and seeded).
- The area north of Klarinet Koppie's opencast pit has been included as ROM Stockpile area 4.
- The berms surrounding the laydown area were constructed using topsoil - and will be backfilled into the area next to the berms.

- A waste storage area was not included in the financial provisioning as no details were available with regards to the facility. Once details become available the facility should be included in the next closure liability review.

2. LEGISLATION AND GUIDELINES APPLICABLE

National Environmental Management Act, 1998 (act 107 of 1998) NEMA.

The promulgation of GN 1147 on the 20th of November 2015 has resulted in a number of new requirements regarding closure and rehabilitation planning and financial provision. The purpose of these regulations is to regulate the determination and making of financial provision as contemplated in the Act for the costs associated with the undertaking of management, rehabilitation, and remediation of environmental impacts from prospecting, exploration, mining or production operations through the lifespan of such operations and latent or residual environmental impacts that may become known in the future.

According to regulation 11, *the holder of a mining right or permit must ensure that a review is undertaken of the requirements for –*

a) Annual rehabilitation, as reflected in the rehabilitation plan;

b) Final rehabilitation, decommissioning and closure of the prospecting, exploration, mining or production operations at the end of life of operations as reflected in a final rehabilitation, decommissioning and mine closure plan; and

c) Remediation of latent or residual environmental impacts which may become known in the future, including the pumping and treatment of polluted or extraneous water, as reflected in an environmental risk assessment report.

Appendix 3 of the regulations identifies the following minimum content of the annual rehabilitation plan:

- Relevant for 1 year – annual update to reflect progress related to rehab and remedial activities in preceding 12 months and plan for next 12 months.
- Contain info to define concurrent rehabilitation and remedial actions and how these relate to the closure vision as per closure plan.
- Indicate what closure objectives and criteria are being achieved
- Must be measurable and auditable
- Details of
    - person preparing the plan
    - Experience of person
    - Timeframes of implementation of current and review of previous rehab activity
- The pertinent environment and project context related to planned rehab and remedial activities
- Results of risk identified in closure plan
- Identification of shortcomings experienced in preceding 2 months
- Details of rehab and remedial actions for next 12 months

    - If no areas are available – motivate
    - Where areas are available:
        - Nature or type of activity and associated infrastructure;
        - Planned remaining life of activity under consideration;
        - Area already disturbed or planned to be disturbed in period of review;
        - Percentage of planned or already disturbed area available for concurrent rehabilitation;
        - Notes on difference if any;
        - Details on rehab activities to be undertaken;
        - The pertinent closure objectives and performance targets to be addressed in the forthcoming year;
        - Description of the closure design criteria.
- Site plan indicating the total area disturbed, area available for rehabilitation and the area to be rehabilitated or remediated.
- Review of the previous year's annual rehabilitation and remediation activities.
- Costing:
    - Methodology
    - Auditable calculations per activity or infrastructure
    - Cost assumptions
    - Monitoring and maintenance cost.

Appendix 4 of the regulations addressed the content of the final rehabilitation, decommissioning and mine closure plan.

- Must be measurable and auditable
- Consider post mining end use of affected area;
- Defined closure vision, objectives as well as design and relinquishment criteria;
- Indicate what infrastructure will ultimately be decommissioned, closed, removed and remediated.
- Indicate how closure actions will be implemented or achieve closure relinquishment criteria;
- Indicate monitoring, auditing and reporting requirements.
- The plan must:
    - Include:
        - Details & experience of the EAP
    - Context of the project, including:
        - Material information and issues guiding the development of the plan;
        - An overview of:
            - Environmental context;
            - Social context.
        - Stakeholder issues and comments

        - Mine plan and schedule for the full approved operations
            - An appropriate description of the mine plan
            - Drawings and figures of mine development
            - Disturbed areas
            - Infrastructure & structure development
    - Findings of an environmental risk assessment leading to the most appropriate closure strategy:
        - Description of the risk assessment methodology
        - Identification of indicators sensitive to potential risk
        - Conceptual closure strategies
        - Reassessment of the risk assessment incorporating closure strategies as mitigation acceptable to mining operations and stakeholders
        - Explain any changes to risk assessment results.
    - Design principles
        - Legal and governance framework for closure design principles
        - Closure vision, objectives and targets
        - Description and evaluation of alternative closure and post closure options
        - Motivation for the preferred closure action
        - Definition and motivation for the closure and post closure period
        - Details associated with ongoing research on closure options
        - Detailed description of the assumptions made to develop closure actions.
    - Final post mining land use
        - Description of appropriate and feasible final post closure land use for the overall project and per infrastructure or activity – describe methodology on how this was determined
        - Map of final post mining land use
    - Closure action to include
        - Specific technical solutions related to infrastructure and facilities of preferred option
        - Development and maintenance of a list and assessment of threats and opportunities and any uncertainties associated with the closure options.
    - Schedule of actions for final rehabilitation
        - Link to the Mining Works Programme
        - Assumptions and schedule drivers
        - Spatial map of the schedule.
    - An indication of the organisational capacity to implement the plan
        - Organisational structure
        - Responsibilities
        - Training and capacity building to build closure components.

- Indication of gaps in the plan
- Relinquishment criteria and auditable indicators
- Closure cost estimation procedure
    - 50% accuracy >30 years LOM
    - 70% accuracy 10-30 years LOM
    - 80% accuracy 5-10 years LOM
    - 90% accuracy 0-5 years LOM
    - Closure methodology
    - Auditable calculations
    - Cost assumptions
    - Annual update
- Monitoring and auditing reporting requirements
    - Schedule outlining internal, external and legislated audits
        - Person responsible for undertaking audits
        - Planned date of audits
        - Explanation of the approach that will be followed to address and close out audit results and schedule
    - Schedule of reporting requirements
    - Monitoring plan
    - Motivation for amendments made to the plan.

Appendix 5 contains the minimum requirements for the risk assessment report, including:

- Content as per current risk assessment report, except for:
    - Substantiation as to why a risk is latent and not able to be mitigated during operations;
    - Description of risk triggers
    - Where appropriate, differentiate between capital, operating, replacement and maintenance costs.

3. COST CALCULATION GUIDELINES

3.1 Demolition and rehabilitation rates

The CES Group was contracted by Shangoni to acquire rates for demolition and rehabilitation of mining activities (Table 2). Procurement of budget pricing approached by identifying reputable demolition companies, various sites of varying sizes at various locations and identifying local companies in the study area with ability to work on similar scale project. A bill of quantities (BoQ) was distributed to the various companies. The table below indicates the number of contractors to which the BoQ was distributed and the number of tenders received afterwards.

Table 2: Results of rate acquisition process

Area	Number of contractors identified	Tenders received
National	6	1
North West	6	3
Free State	5	1
Northern Cape	7	2
Limpopo	5	3 (One joint venture with national based company)
Total	29	10

The prices received from contractors were reviewed by the CES Group, after which average and meridian rates were drawn rates to correctly establish a baseline rate. The following methods to establish the baseline rates were followed:

- Price A - Average if priced – across the board average of rates received per category;
- Price B - Median pricing – “middle” rate of all rates in series per category;
- Price C - Average between Price A & B;
- Price D - Average rate excluding top and bottom rates per category.
- Price D - rate category that was used in the closure cost calculation, unless otherwise indicated in the closure cost spreadsheet “Rate” sheet.

The backfill rates used were supplied by Bushveld Chrome Minerals as the rate provided by their contractors. The backfilling of the Phase 1 opencast pit will be costed at a rate of R7.12 / m^3 (excluding P&G allowances).

The closure budget consists of the following areas:

- Physical - Demolition of infrastructure where infrastructure does not form part of end land use. Potential to transfer to third party was identified.

- Biophysical - Actions to safeguard (making safe and stable) and re-establish the biophysical to ensure a sustainable landform and mitigate identified risks. This includes levelling of the dumps, seeding of the trees and grass.

4. CLOSURE COMMITMENTS

4.1 Commitments on closure cost in the current EMP

The current EMP has no commitments to closure objectives – closure commitments will be incorporated into the EMP once the Spitsvale Mine Rehabilitation, Closure and Liability plan has been completed and comments from interested and affected parties have been obtained.

The overall closure objectives as defined in the closure plan with the aim of addressing the closure vision, are as follows:

- Adhere to all statutory and other legal requirements.
- To develop landforms and land-uses that are stable, sustainable and aesthetically acceptable on closure.
- Ensure safety & health of all stakeholders during closure and post closure and that communities using the site after closure are not exposed to unacceptable risks.
- Ensure that closure supports productive uses considering pre-mining conditions and are in agreement with commitments to stakeholders.
- Physically and chemically stabilise remaining structures to minimise residual risks.
- Promote bio-diversity and biological sustainability to the maximum extent practicable.
- Utilize closure strategies that promote a self-sustaining condition with little or no need for ongoing care and maintenance.
- To achieve agreed quality targets set by the Catchment Management Authority (CMA) and the Department of Water and Sanitation (DWS) as far as practical relative to impacts and reasonability to achieve.

Proposed land-use

- The aim will be to return the area to the previous land use, which consisted of mountainous areas covered by shrubby grassland. The overall post closure land use for the mine has been determined to be (Viljoen & Strohbach; 2016): Landforms, that sustain indigenous vegetation which limits water and wind erosion;
- Mosaic of nodes where existing infrastructure is utilised by stakeholders for a variety of post closure activities surrounded by areas rehabilitated back to a land capability possible of supporting indigenous vegetation as well as land capable of supporting the various community initiatives in which the mine is involved.

5. CURRENT CLOSURE PROVISION

The quantum was calculated using the demolition and rehabilitation rates obtained from the CES Group and has been calculated as **R 6 140 648.41 (including P&G, contingency and excluding VAT)** for the physical and biophysical component associated with the current activities and infrastructure on the site which includes open pit 1, waste rock stockpiles, ore stockpile areas, ROM stockpile area, roads, and laydown area 1. Refer to Figure 1 for a visual presentations of the biophysical closure costs. In terms of physical closure, the contribution was R 0.00 towards the closure quantum and therefore no graphs have been included in this report.

All infrastructure will either be removed off site by the mining contractor or be taken over by the community. Therefore, only the biophysical components contribute to both the proposed and current calculated closure costs.

The community have expressed an interest in some of the physical infrastructure, such as some of the laydown area buildings, the access and haul roads as well as the ROM stockpile's footprints for future use (Refer to the letter from the community, attached in Appendix 3).

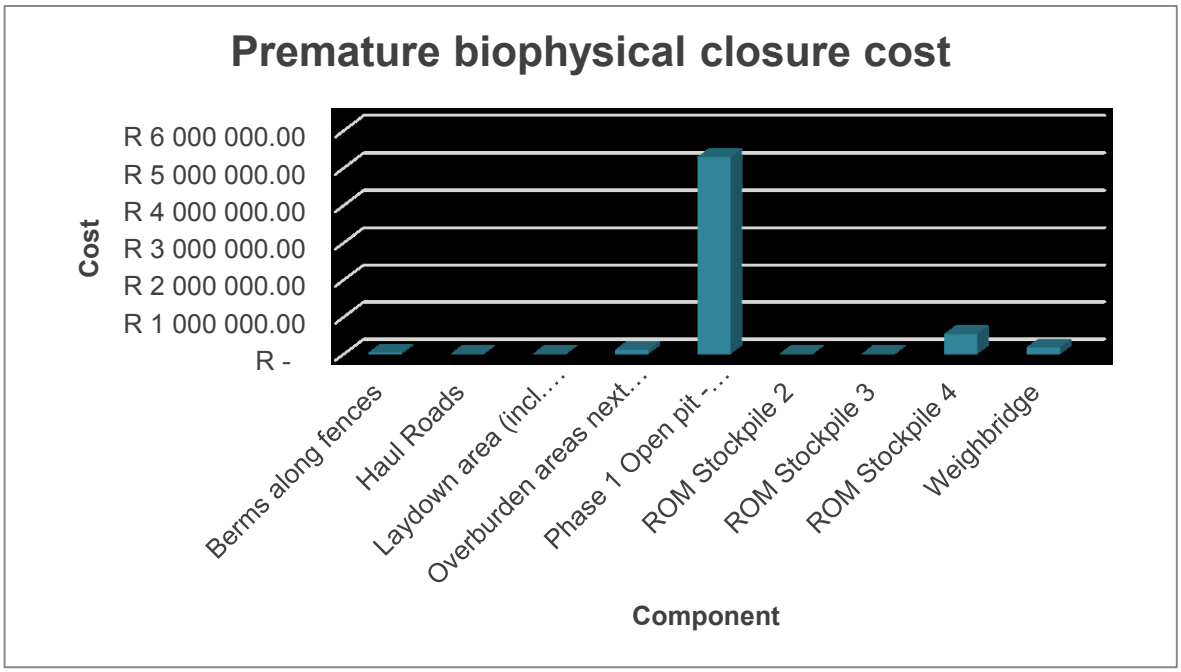

Figure 1: Premature biophysical closure cost.

The backfilling and rehabilitation of the existing pit (at Klarinet Koppie) currently contributes the most towards the biophysical component of premature closure, followed by the ripping and vegetation of the ROM Stockpile 4 footprint area.

The quantum calculated for all activities and infrastructure associated with the entire Spitsvale Project (including mining of phase 2 and 3 and the associated infrastructure) was calculated as **R8 699 326.49** (**including P&G, contingency and excluding VAT).** Refer to Figure 2 for visual presentations of the biophysical closure component's costs for all future developments.

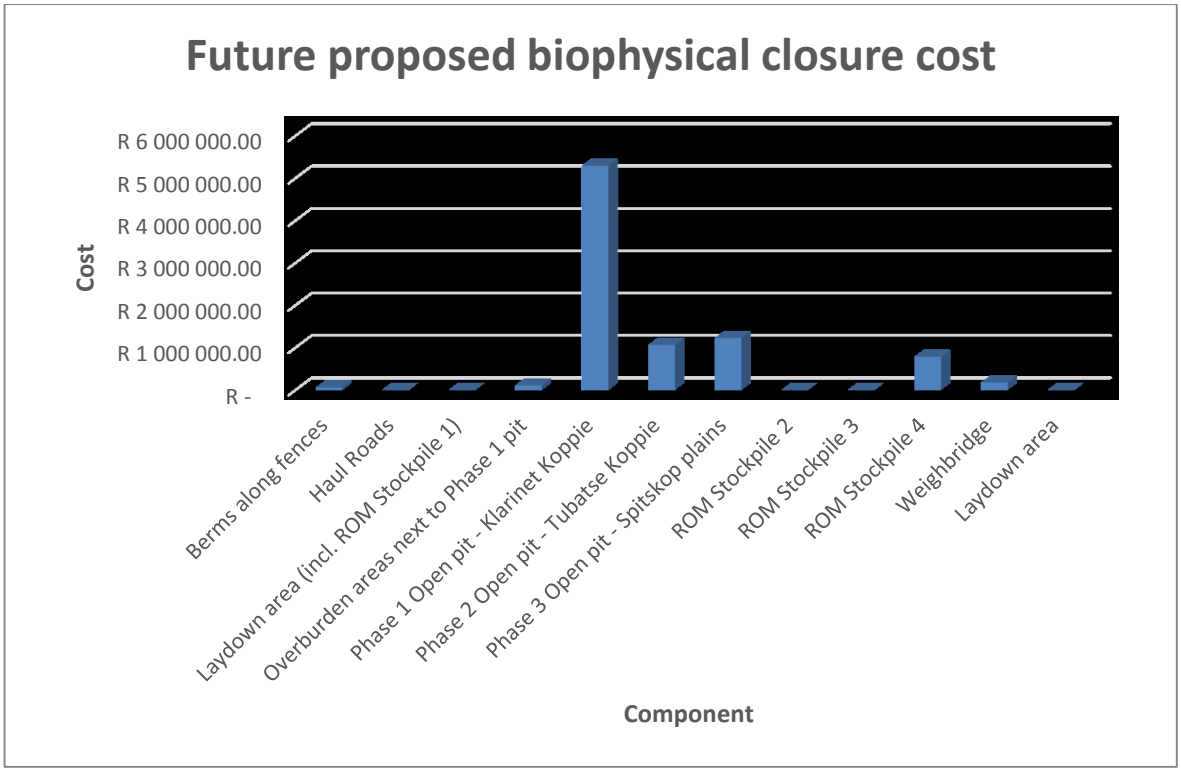

Figure 2: Biophysical closure cost for proposed mining activities.

In terms of the biophysical component of future proposed closure costs, the highest contribution to the costs comes from the rehabilitation of the existing pit at Klarinet Koppie. The rehabilitation of the pits associated with phase 2 and phase 3 also contribute a substantial amount to the total biophysical closure costs.

5.1 Knowledge gaps and opportunities

The following knowledge gaps and opportunities to reduce the closure quantum have been identified during the review process:

- The implementation of a rehabilitation plan will identify areas that can be rehabilitated concurrently, reducing closure costs.
- Closure costs can be reduced by negotiating with the local municipality regarding taking over the responsibility for some infrastructure, for example substations and the sewage treatment plant.

- The proposed laydown site to be constructed for the mining of phase 2 at Tubatse Koppie has not yet commenced. It has been assumed that the laydown area will be an exact replica of the laydown area at Klarinet Koppie.
- Detailed infrastructure information, lists and mine plans are required in order to improve the accuracy of the quantum calculations.
- Detailed information related to the Pollution Control Dams was not available at the time of quantum calculation as BCR are still awaiting designs. The pollution control dams will be constructed in the future and as a result be included in the next closure liability review.
- Detailed information related to stormwater infrastructure was not available at the time of quantum calculation as BCR are still awaiting designs. The stormwater infrastructure will be constructed in the future and as a result be included in the next closure liability review.
- Detailed information related to river crossings was not available at the time of quantum calculation as BCR are currently awaiting designs. The river crossings will be constructed in the future and as a result be included in the next closure liability review.
- A mobile sewage treatment facility was not included in the financial provisioning as no details were available with regards to the facility. Once details become available the facility should be included in the next review.

6. INFORMATION USED FOR CALCULATING THE QUANTUM

6.1 Process followed

Most of the information used for the quantum calculation was obtained from the draft closure plan, the prospecting rights and associated EMP's. Various images and the most recent Google earth imagery was used, as found in specialists' reports, to identify and mark the entire related infrastructure. Refer to Figure 3 for an overview of the Spitsvale Project area and layout.

Once this was complete a list of all the infrastructure was compiled. Figure 4 present a visual layout of all the existing infrastructure located at laydown area 1. The infrastructure was classified in accordance with the tariffs list (Table 3) and the surface areas of the infrastructure were calculated to determine the volume or surface requiring rehabilitation or demolition. A detailed list has been attached as Appendix 1.

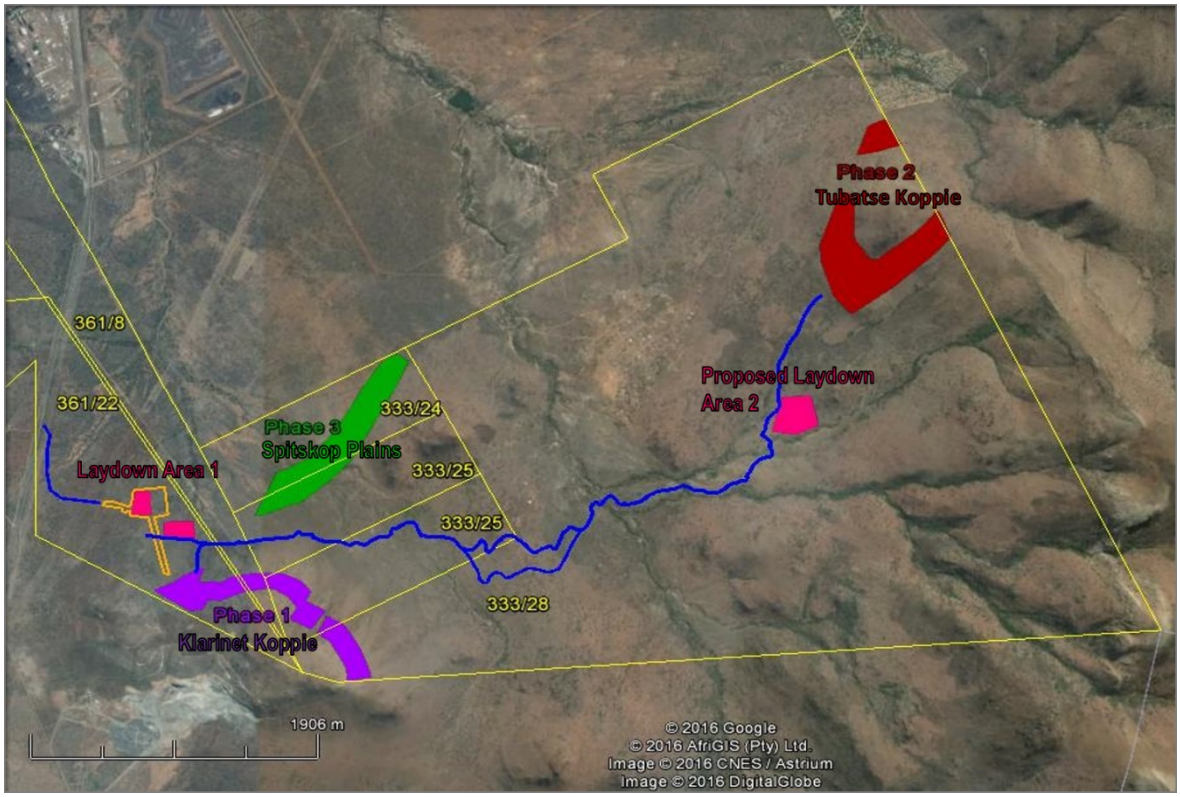

Figure 3: Overall layout of the Spitsvale Project

(Source: Viljoen & Strohbach: 2016)

Figure 4: Laydown area 1 infrastructure

6.2 Tariffs

Table 3: Tariffs used for quantum determination

Rehabilitation and Demolition	List reference	Unit	Rates
800mm thick /deep Reinforced in situ concrete structures: Demolition and removal to demolition site	800mm concrete structures	m³	R 820.57
400mm thick /deep reinforced concrete	400mm concrete structure	m³	R 750.69
250mm thick /deep reinforced concrete	250mm concrete structure	m³	R 673.10
340mm thick /deep concrete slabs	340mm concrete structures	m³	R 741.57
220mm thick brick wall buildings (single storey) Face brick building, 14.8 x 10m x 4.4m high, consisting of 600 x 230mm strip footings laying 655mm deep, 150mm surface bed finished off with ceramic floor tiles including 110mm internal walls, with 1000 x 100mm apron around building and Roller shutter doors at service hatch 3000 x 1200mm. Ceilings at 2805mm high. Roof trusses 1600mm high at centre with 500mm overhang, pitching 15 degrees and 0.6mm IBR profiled colomet roof sheeting, ridge capping, fascia boards, barge boards, gutters and downpipes.	Single storey double brick building	m²	R 494.43
Face brick building, 48 x 12.46m x 7.85m high, consisting of 750 x 300mm strip footings laying 755mm deep, 150mm surface bed finished off with ceramic floor tiles including 110mm internal walls, with 1000 x 100mm apron around building. Ceiling below hollow block slab at 2805mm high. 1st floor hollow block slab, 255mm thick finished off with ceramic floor tiles. Stairs to 1st floor 220mm threads x 150mm risers and slab to wall at 1400mm high in middle and to one side of building. Ceilings at 2890mm high. Prefabricated roof trusses 1900mm high at centre with 500mm overhang, pitching 15 degrees and 0.6mm colomet roof sheeting, ridge capping, fascia boards, barge boards, gutters and downpipes. Canopy at entrance to building 3m wide x 2.8m high	Multi-level double brick building	m³	R 534.21
Excavating foundations 600 x 230 x 655mm deep strip footings	Excavating foundations	m³	R 674.32
Light steel construction cladded with corrugated iron (car ports etc.) Carports 7.5m x 11m, consisting of 6 x 75 SHS Columns in 500mm deep concrete bases with colomet 6mm IBR roof sheeting on 75 x 75 SHS Curved purlins (one carport size 5.5 x 2.5m x 2.3m high)	Light steel	m²	R 68.38
Medium steel construction buildings (corrugated iron cladded workshops and sheds with concrete floors)	Medium steel	m²	R 512.93

Dismantle, break down and remove plant structure, not exceeding 15m height	Heavy steel	m²	R 312.97
Demolish and remove 48kg/m railway line on P2 concrete sleepers, including fasteners, pads & clips.	Infrastructure: Railway lines	m	R 166.50
Up to 400mm Diameter piping	Infrastructure: Pipelines <400mm	m	R 37.69
Greater than 400mm Diameter piping	Infrastructure: Pipelines >400mm	m	R 67.90
Dismantle and remove Cattle Fencing not exceeding 1.2m high, including posts, gates, foundations, etcetera	Dismantling fences 1.2m	m	R 28.56
Dismantle and remove Mesh Fencing not exceeding 1.8m high, including posts, gates, foundations, etcetera	Dismantling fences 1.8m Mesh	m	R 30.79
Dismantle and remove Security Fencing exceeding 1.8m high, including posts, gates, foundations, etcetera	Dismantling fences 1.8m Security	m	R 32.04
Dismantle and remove Steel Palisade Fencing exceeding 1.8m high, including posts, gates, foundations, etcetera	Dismantling fences 1.m Steel palisade	m	R 51.04
Dismantle and remove Palisade Concrete Fencing exceeding 1.8m high, including posts, gates, foundations, etcetera	Dismantling fences 1.8m Palisade & concrete	m	R 51.04
Dismantle and remove Electric Fencing not exceeding 2.1m high, including posts, gates, foundations, etcetera	Dismantling fences 2.1m Elec.	m	R 34.10
Dismantle and remove Diamond Mesh Fencing not exceeding 2.4m high, including posts, gates, foundations, etcetera	Dismantling fences 2.4m Diamond mesh	m	R 32.37
Dismantle and remove Precast walling not exceeding 1.8m high, including posts, gates, foundations, etcetera	Dismantling fences 1.8m Pre-cast	m	R 36.28
Wildlife fence 1.8m	Erecting fences	m	R 140.00
15m H Pole structure complete with double 11kV Wolf conductor (6 x ACSR) and all accessories	Infrastructure: Powerlines	m	R 110.99
Demolition of re-inforced concrete silo 20m high	Silos	m³	R 578.77
Disconnect and remove 2 x MCC panels. Demolish and remove face brick building 6,5 x 9 x 5.05m high to roof truss, strip footings laying 750mm deep, 6 x 2m high columns with 300mm thick concrete slab on columns. Steel stairs and hand railing to 1st floor. Steel roof structure 1,6m high to pitch.	Infrastructure: Sub-stations	no	R 87 000.00
Disconnect and remove transformers, demolish transformer room brick building, 3 x 3 x 4m high.	Infrastructure: Transformers	no	R 36 650.23
Remove fuel pumps & tank	Fuel pumps & tanks	m³	R 6 695.75
Remove overhead workshop cranes 15 Ton Single Girder crane - 20m wide	Workshop cranes	no	R 13 370.00
Drain and fill French drain	French drain	no	R 13 662.15
Filling of Soakaways	Soakaway toilet	no	R 11 995.48
Remove water tank	Water tanks	m³	R 6 695.75
Permatank	Underground fuel tanks	m³	R 22 716.67
Overland conveyor	Conveyor belts	m	R 522.00
Earthworks, break-up and level	Earth dams	m³	R 91.25

6m Office	Temporary office 6m	no	R 2 848.33
12m Office	Temporary office 12m	no	R 3 808.03
9.6m Park home	Temporary office 9.6m	no	R 3 474.70
Decommissioning of Borehole (capping and removing all infrastructure)	Borehole sealing	no	R 86 666.67
Sealing of shaft (10m plug) 5 x 5 x 10m deep	Shaft dismantle	m³	R 3 758.41
Dismantle and remove vertical shaft infrastructure and plug with concrete including structural steel permanent formwork, anchors etc.	Shaft seal	m³	R 3 758.41
Sealing of adits 5 x 5 x 5m deep	Adit sealing	m³	R 3 960.41
No cost incurred	No cost incurred	n/a	R -
Ripping of dirt road	Ripping	m²	R 14.89
Ripping of previously tar surfaced surface areas (tar removal measured elsewhere)	Tar road ripping	m²	R 21.31
Remove tarred surface areas not exceeding 50mm thick	Tar removal	m²	R 25.87
Break-up and remove paving bricks	Paving removal: Bricks	m²	R 34.94
Break-up and remove concrete paving	Paving removal: Concrete	m²	R 30.51
Demolish reinforced concrete	Weigh bridges	m³	R 950.69
Remove pumps and piping and demolish pump room size 3,5 x 5,25 x 3m high.	Pumps & pump rooms	no	R 20 000.00
Drain dam, leave to dry, remove liner	Return water dams	m²	R 45.51
Earthworks, break-up and level	Fresh water earth dams	m³	R 45.00
Levelling slopes between 18-30 degrees with Bulldozer	Dump levelling: Bulldozer	m³	R 41.98
Levelling slopes between 18-30 degrees with Grader	Dump levelling: Grader	m³	R 38.90
20 Litre Bag	Planting trees 20l	no	R 196.08
50 Litre Bag	Planting trees 50l	no	R 599.50
100 Litre Bag	Planting trees 1000l	no	R 1 265.00
Traditional seeding	Seeding	m²	R 11.95
Grass	Planting grass	m²	R 43.08
Enviroberm	Enviroberm	m	R 22.55
Hydro seeding	Hydro-seeding/mulching	m²	R 26.50
Backfilling of open pit	Backfilling of pit	m³	R 7.12

6.3 Closure cost calculation

The following tables contain summaries of the calculations made for the premature closure cost taking into account the current infrastructure and activities.

Table 4: Calculations made for the premature closure cost related to the biophysical components.

Sum of Final cost - Biophysical	
Description	**Total**
Berms along fences	R 34 966.82
Haul Roads	R -
Laydown area (incl. ROM Stockpile 1)	R -
Overburden areas next to Phase 1 pit	R 108 984.00
Phase 1 Open pit - Klarinet Koppie	R 5 290 871.36
ROM Stockpile 2	R -
ROM Stockpile 3	R -
ROM Stockpile 4	R 531 968.80
Weighbridge	R 173 857.43
Grand Total	**R 6 140 648.41**

Refer to Appendix 1 for the detailed quantum calculations for premature closure as well as the future closure costs associated with the commencement of phase 1 and 2 of the Spitsvale project.

6.4 External Review

The compiled excel spreadsheet including the cost estimates was reviewed by an external financial specialist (external financial auditor) to ensure that all calculations and formulas within the spreadsheets were correct and accurate. Refer to Appendix 2 which contains the letter received from Fourie & Botha Chartered Accountants as proof of external financial review.

Appendix 1 – Detail Quantum Calculations

The attached spreadsheet provides the background of the calculation as presented in the summary on the closure cost. In the following tables, “Item no. map” refers to Figure 7 which indicates roughly where the different structures are located.

Table 5: Calculation for premature closure (Physical Components)

No	Main area	Sub area	Description	Item no. (map)	Status	Objective	Implementation phase	Rate category	Note / Comment	L	W	H	Size	Number / other/ factor	Total Size	Rates	Final cost
1	Laydown area 1 (Klarinet Koppie)	Workshop 1	WS 1 (building - walls)	A3	Operational	To remain	Closure	Medium steel		19.92	13.13	1	261.5496	0[1]	0	512.93	R 0.00
2	Laydown area 1 (Klarinet Koppie)	Workshop 1	WS 1 (floor)	A3	Operational	To remain	Closure	400mm concrete structure	*Including washbay*	27	18.3	0.4	197.64	0	0	750.69	R 0.00
3	Laydown area 1 (Klarinet Koppie)	Workshop 1	WS 1 (Container with tools and spares)	A3	Operational	To be removed	Closure	Temporary office 6m		1	1	1	1	0[2]	0	2848.33	R 0.00
4	Laydown area 1 (Klarinet Koppie)	Workshop 1	WS 1 (Container with tools and spares)	A3	Operational	To be removed	Closure	Temporary office 6m		1	1	1	1	0	0	2848.33	R 0.00
5	Laydown area 1 (Klarinet Koppie)	Core Yard	Core yard and green area / training facility	A4	Operational	To remain	Closure	Single storey double brick building		9	13.6	1	122.4	0	0	494.43	R 0.00
6	Laydown area 1 (Klarinet Koppie)	Change House	Change house area	A5	Operational	To remain	Closure	Single storey double brick building		6.95	5.17	1	35.9315	0	0	494.43	R 0.00
7	Laydown area 1 (Klarinet Koppie)	Admin Facilities	Admin facilities: office, kitchen and ablution	A6	Operational	To remain	Closure	Single storey double brick building		6.22	14.98	1	93.1756	0	0	494.43	R 0.00
8	Laydown area 1 (Klarinet Koppie)	Admin Facilities	Toilets	A7	Operational	To remain	Closure	French drain		1	1	1	1	0	0	13662.2	R 0.00
9	Laydown area 1 (Klarinet Koppie)	Admin Facilities	Admin facilities: Main boardroom	A7	Operational	To remain	Closure	Single storey double brick building		6.65	6.6	1	43.89	0	0	494.43	R 0.00
10	Laydown area 1 (Klarinet Koppie)	Admin Facilities	Admin facilities: Geology and logistics office	A8	Operational	To be removed	Closure	Temporary office 6m		1	1	1	1	0	0	2848.33	R 0.00
11	Laydown area 1	Admin Facilities	Admin facilities: Site Manager office	A9	Operational	To be removed	Closure	Temporary office 6m		1	1	1	1	0	0	2848.33	R 0.00

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[1] All the cells indicated in pink indicate the structures which Community wish to take ownership of.
[2] All the cells indicated in yellow indicate the temporary structures owned by mining contractor

	(Klarinet Koppie)																
12	Laydown area 1 (Klarinet Koppie)	Admin Facilities	Admin facilities: Mine/ Pit Manager office	A10	Operational	To be removed	Closure	Temporary office 12m		1	1	1	1	0	0	3808.03	R 0.00
13	Laydown area 1 (Klarinet Koppie)	Admin Facilities	Admin facilities: Survey office	A11	Operational	To be removed	Closure	Temporary office 6m		1	1	1	1	0	0	2848.33	R 0.00
14	Laydown area 1 (Klarinet Koppie)	Admin Facilities	Admin facilities: Spares storage	A12	Operational	To be removed	Closure	Temporary office 6m		1	1	1	1	0	0	2848.33	R 0.00
15	Laydown area 1 (Klarinet Koppie)	Parking	Light plant undercover parking	A13	Operational	To remain	Closure	Light steel		1	1	1	1	0	0	68.38	R 0.00
16	Laydown area 1 (Klarinet Koppie)	Clinic	On site clinic	A14	Operational	To remain	Closure	Single storey double brick building		8.32	5	1	41.6	0	0	494.43	R 0.00
17	Laydown area 1 (Klarinet Koppie)	Fence	Fence surrounding office complex		Operational	To remain	Closure	Dismantling fences 1.8m Mesh		216.1	1	1	216.14	0	0	30.79	R 0.00
18	Laydown area 1 (Klarinet Koppie)	Parking	Parking area	A15	Operational	To remain	Closure	Light steel		11.75	11.83	1	139.0025	0	0	68.38	R 0.00
19	Laydown area 1 (Klarinet Koppie)	Parking	Parking area	A16	Operational	To remain	Closure	Light steel		23.16	6.25	1	144.75	0	0	68.38	R 0.00
20	Laydown area 1 (Klarinet Koppie)	Bulk Hazardous substances storage	Bulk hazardous substance storage (Diesel); oil trap and sump	A17	Operational	To be removed	Closure	Fuel pumps & tanks	*3 Diesel tanks & pump: 31.85 m3 per tank - assumed to include the fuel and lubricant store*	95.55	1	1	95.55	0	0	6695.75	R 0.00
21	Laydown area 1 (Klarinet Koppie)	Bulk Hazardous substances storage	Bulk hazardous substance storage facility	A17	Operational	To remain	Closure	340mm concrete structures	*Bunded area surrounding and next to the fuel tanks*	18	9	0.34	55.08	0	0	741.57	R 0.00
22	Laydown area 1 (Klarinet Koppie)	Diesel generator	Diesel generator plant	A18	Operational	To remain	Closure	Single storey double brick building		3.24	3.64	1	11.7936	0	0	494.43	R 0.00
23	Laydown area 1 (Klarinet Koppie)	Tool shed	Spare tool shed (unused)	A21	Operational	To be removed	Closure	Temporary office 6m		1	1	1	1	0	0	2848.33	R 0.00
24	Laydown area 1 (Klarinet Koppie)	Storage shed - air filters	Air filter storage for drill rigs (removed from site)	A23	Operational	To be removed	Closure	Temporary office 6m		1	1	1	1	0	0	2848.33	R 0.00
25	Laydown area 1 (Klarinet Koppie)	Storage shed - air filters	Air filter storage for drill rigs (removed from site)	A24	Operational	To be removed	Closure	Temporary office 6m		1	1	1	1	0	0	2848.33	R 0.00

26	Laydown area 1 (Klarinet Koppie)	Weighbridge office	Weighbridge office	A29	Operational	To be removed	Closure	Temporary office 6m		1	1	1	1	0	0	2848.33	R 0.00
27	Laydown area 1 (Klarinet Koppie)	Water facilities	Goose neck filling point for water cart	A19	Operational	To remain	Closure	250mm concrete structure		1.8	1.7	0.25	0.765	0	0	673.1	R 0.00
28	Laydown area 1 (Klarinet Koppie)	Water facilities	Water pump house	A19	Operational	To remain	Closure	Light steel		2	2	1	4	0	0	68.38	R 0.00
29	Laydown area 1 (Klarinet Koppie)	Water facilities	Water storage facilities (2 x 10 000 l Jojo tanks)	A19	Operational	To be removed	Closure	Water tanks		10	1	1	10	0	0	6695.75	R 0.00
30	Laydown area 1 (Klarinet Koppie)	Water facilities	Water storage facilities (2 x 5000 l Jojo tanks)	A19	Operational	To be removed	Closure	Water tanks		5	1	1	5	0	0	6695.75	R 0.00
31	Other	Fence	Fencing		Operational	To remain	Closure	Dismantling fences 1.8m Mesh	*Fence around laydown area*	908	1	1	908	0	0	30.79	R 0.00
32	Other	Fence	Fencing		Operational	To remain	Closure	Dismantling fences 1.8m Mesh	*Fence from laydown area to weighbridge*	379.6	1	1	379.6	0	0	30.79	R 0.00
33	Other	Mobile plants	Mobile plants		Operational	To be removed	Closure	Heavy steel	*EMPR - 4 stockpiles*	17	2	4	136	0	0	312.968	R 0.00
34	Other	Water facilities	River crossings		To be implemented	N/A	Closure	No data currently	*BCR awaiting designs*	0	0	0	0	0	0	0	0
35	Other	Water facilities	Storm water management infrastructures		To be implemented	N/A	Closure	No data currently	*BCR awaiting designs*	0	0	0	0	0	0	0	0
36	Other	Water facilities	Pollution Control Dams (PCD's)		To be implemented	N/A	Closure	No data currently	*BCR awaiting designs*	0	0	0	0	0	0	0	0
37	Other	Water facilities	Boreholes		To be implemented	To remain	Closure	No cost incurred	***To be used for compliance monitoring***	1	1	1	1	0	0	0	0
																TOTAL	**R 0.00**

Table 6: Calculation for premature closure (Biophysical Components)

No.	Main area	Description	Item no. (map)	Status	Objective	Implementation phase	Rate category	Note / Comment	L	W	H	Size (m / m² / m³)	Number / other/ factor	Total Size	Rates	Final cost
1	Laydown area 1 (Klarinet Koppie)	Laydown area (incl. ROM Stockpile 1)	A2	Operational	To remain	Closure	Ripping	Whole laydown area - including the ROM 1 stockpile footprint The Community have requested that the stockpile areas be left intact for future cattle kraals.	184	215	1	39560	0	0	14.89	R 0.00
2	Laydown area 1 (Klarinet Koppie)	Laydown area (incl. ROM Stockpile 1)	A2	Operational	To remain	Closure	Seeding	The Community have requested that the stockpile areas be left intact for future cattle kraals.	184	215	1	39560	0	0	11.95	R 0.00
3	Laydown area 1 (Klarinet Koppie)	Weighbridge	A28	Operational	To be re-vegetated	Closure	Weigh bridges		38.5	4.75	1	182.875	1	182.875	950.69	R 173 857.43
4	Laydown area 1 (Klarinet Koppie)	Berms along fences	A30	Operational	To make safe	Closure	Dump levelling: Bulldozer	Assumption is made that the berms have been constructed from topsoil. At closure topsoil will be used to level the area alongside the berm	832.94	1	1	832.94	1	832.94	41.98	R 34 966.82
5	Mine wide	Haul Roads	A20	Operational	To remain	Closure	Ripping	From operations (Phase 1) to Laydown area 1 The Community have requested that the access & haul roads remain present Double road	575	14	1	8050	0	0	14.89	R 0.00
6	Mine wide	Haul Roads	A20	Operational	To remain	Closure	Seeding	The Community have requested that the access & haul roads remain present	575	14	1	8050	0	0	11.95	R 0.00
9	Mine wide	ROM Stockpile 3	A25	Operational	To remain	Closure	Ripping	The Community have requested that the stockpile areas be left intact for future cattle kraals.	152.4	94	1	14325.6	0	0	14.89	R 0.00
10	Mine wide	ROM Stockpile 3	A25	Operational	To remain	Closure	Seeding	The Community have requested that the stockpile areas be left intact for future cattle kraals.	152.4	94	1	14325.6	0	0	11.95	R 0.00
11	Mine wide	ROM Stockpile 2	A26	Operational	To remain	Closure	Ripping	The Community have requested that the stockpile areas be left intact for future cattle kraals.	116	175.3	1	20334.8	0	0	14.89	R 0.00
12	Mine wide	ROM Stockpile 2	A26	Operational	To remain	Closure	Seeding	The Community have requested that the stockpile areas be left intact for future cattle kraals.	116	175.3	1	20334.8	0	0	11.95	R 0.00
13	Mine wide	ROM Stockpile 4	A27	Operational	To remain	Closure	Ripping	Assumption: Stockpile North of the pit To be rehabilitated	19820	1	1	19820	1	19820	14.89	R 295 119.80
14	Mine wide	ROM Stockpile 4	A27	Operational	To remain	Closure	Seeding	Assumption: Stockpile North of the pit To be rehabilitated	19820	1	1	19820	1	19820	11.95	R 236 849.00
16	Mine wide	Overburden areas next to Phase 1 pit		Operational	To be re-vegetated	Closure	Seeding		9120	1	1	9120	1	9120	11.95	R 108 984.00
17	Mine wide	Phase 1 Open pit - Klarinet Koppie		Operational	To make safe	Closure	Backfilling of pit	Mining areas 1: volume required for fill: 657503m3	657503	1	1	657503	1	657503	7.12	R 4 681 421.36
19	Mine wide	Phase 1 Open pit - Klarinet Koppie		Operational	To be re-vegetated	Closure	Seeding	Current open pit surface area disturbance 5.1 ha	51000	1	1	51000	1	51000	11.95	R 609 450.00
															TOTAL	**R 6 140 648.41**

Table 7: Calculation for future closure (Physical Components)

No.	Main area	Description	Item no. (map)	Status	Objective	Implementation phase	Rate category	Note / Comment	L	W	H	Size (m / m² / m³)	Number / other/ factor	Total Size	Rates	Final cost
1	Laydown area 1 (Klarinet Koppie)	Workshop 1 (building - walls)	A3	Operational	To remain	Closure	Medium steel		19.92	13.13	1	261.5496	0	0	512.93	R 0.00
2	Laydown area 1 (Klarinet Koppie)	Workshop 1 (floor)	A3	Operational	To remain	Closure	400mm concrete structure	*Including washbay*	27	18.3	0.4	197.64	0	0	750.69	R 0.00
3	Laydown area 1 (Klarinet Koppie)	Workshop 1 (Container with tools and spares)	A3	Operational	To be removed	Closure	Temporary office 6m		1	1	1	1	0	0	2848.33	R 0.00
4	Laydown area 1 (Klarinet Koppie)	Workshop 1 (Container with tools and spares)	A3	Operational	To be removed	Closure	Temporary office 6m		1	1	1	1	0	0	2848.33	R 0.00
5	Laydown area 1 (Klarinet Koppie)	Core yard and green area / training facility	A4	Operational	To remain	Closure	Single storey double brick building		9	13.6	1	122.4	0	0	494.43	R 0.00
6	Laydown area 1 (Klarinet Koppie)	Change house area	A5	Operational	To remain	Closure	Single storey double brick building		6.95	5.17	1	35.9315	0	0	494.43	R 0.00
7	Laydown area 1 (Klarinet Koppie)	Admin facilities: office, kitchen and ablution	A6	Operational	To remain	Closure	Single storey double brick building		6.22	14.98	1	93.1756	0	0	494.43	R 0.00
8	Laydown area 1 (Klarinet Koppie)	Toilets	A7	Operational	To remain	Closure	French drain		1	1	1	1	0	0	13662.15	R 0.00
9	Laydown area 1 (Klarinet Koppie)	Admin facilities: Main boardroom	A7	Operational	To remain	Closure	Single storey double brick building		6.65	6.6	1	43.89	0	0	494.43	R 0.00
10	Laydown area 1 (Klarinet Koppie)	Admin facilities: Geology and logistics office	A8	Operational	To be removed	Closure	Temporary office 6m		1	1	1	1	0	0	2848.33	R 0.00
11	Laydown area 1 (Klarinet Koppie)	Admin facilities: Site Manager office	A9	Operational	To be removed	Closure	Temporary office 6m		1	1	1	1	0	0	2848.33	R 0.00
12	Laydown area 1 (Klarinet Koppie)	Admin facilities: Mine Manager/ Pit Manager office	A10	Operational	To be removed	Closure	Temporary office 12m		1	1	1	1	0	0	3808.03	R 0.00
13	Laydown area 1 (Klarinet Koppie)	Admin facilities: Survey office	A11	Operational	To be removed	Closure	Temporary office 6m		1	1	1	1	0	0	2848.33	R 0.00
14	Laydown area 1 (Klarinet Koppie)	Admin facilities: Spares storage	A12	Operational	To be removed	Closure	Temporary office 6m		1	1	1	1	0	0	2848.33	R 0.00
15	Laydown area 1	Light plant undercover parking	A13	Operational	To remain	Closure	Light steel		1	1	1	1	0	0	68.38	R 0.00

	(Klarinet Koppie)															
16	Laydown area 1 (Klarinet Koppie)	On site clinic	A14	Operational	To remain	Closure	Single storey double brick building		8.32	5	1	41.6	0	0	494.43	R 0.00
17	Laydown area 1 (Klarinet Koppie)	Fence surrounding office complex		Operational	To remain	Closure	Dismantling fences 1.8m Mesh		216.14	1	1	216.14	0	0	30.79	R 0.00
18	Laydown area 1 (Klarinet Koppie)	Parking area	A15	Operational	To remain	Closure	Light steel		11.75	11.83	1	139.0025	0	0	68.38	R 0.00
19	Laydown area 1 (Klarinet Koppie)	Parking area	A16	Operational	To remain	Closure	Light steel		23.16	6.25	1	144.75	0	0		R 0.00
20	Laydown area 1 (Klarinet Koppie)	Bulk hazardous substance storage (Diesel); oil trap and sump	A17	Operational	To be removed	Closure	Fuel pumps & tanks	*3 Diesel tanks & pump: 31.85 m3 per tank - assumed to include the fuel and lubricant store*	95.55	1	1	95.55	0	0	6695.75	R 0.00
21	Laydown area 1 (Klarinet Koppie)	Bulk hazardous substance storage facility	A17	Operational	To remain	Closure	340mm concrete structures	*Bunded area surrounding and next to the fuel tanks*	18	9	0.34	55.08	0	0	741.57	R 0.00
22	Laydown area 1 (Klarinet Koppie)	Diesel generator plant	A18	Operational	To remain	Closure	Single storey double brick building		3.24	3.64	1	11.7936	0	0	494.43	R 0.00
23	Laydown area 1 (Klarinet Koppie)	Spare tool shed (unused)	A21	Operational	To be removed	Closure	Temporary office 6m		1	1	1	1	0	0	2848.33	R 0.00
24	Laydown area 1 (Klarinet Koppie)	Air filter storage for drill rigs (removed from site)	A23	Operational	To be removed	Closure	Temporary office 6m		1	1	1	1	0	0	2848.33	R 0.00
25	Laydown area 1 (Klarinet Koppie)	Air filter storage for drill rigs (removed from site)	A24	Operational	To be removed	Closure	Temporary office 6m		1	1	1	1	0	0	2848.33	R 0.00
26	Laydown area 1 (Klarinet Koppie)	Weighbridge office	A29	Operational	To be removed	Closure	Temporary office 6m		1	1	1	1	0	0	2848.33	R 0.00
27	Laydown area 1 (Klarinet Koppie)	Goose neck filling point for water cart	A19	Operational	To remain	Closure	250mm concrete structure		1.8	1.7	0.25	0.765	0	0	673.1	R 0.00
28	Laydown area 1 (Klarinet Koppie)	Water pump house	A19	Operational	To remain	Closure	Light steel		2	2	1	4	0	0	68.38	R 0.00
29	Laydown area 1 (Klarinet Koppie)	Water storage facilities (2 x 10 000 l Jojo tanks)	A19	Operational	To be removed	Closure	Water tanks		10	1	1	10	0	0	6695.75	R 0.00
30	Laydown area 1 (Klarinet Koppie)	Water storage facilities (2 x 5000 l Jojo tanks)	A19	Operational	To be removed	Closure	Water tanks		5	1	1	5	0	0	6695.75	R 0.00

31	Laydown area 2 (Tubatse Koppie)	Workshop 1 (building - walls)	A3	Future infrastructure	To remain	Closure	Medium steel		19.92	13.13	1	261.5496	0	0	512.93	R 0.00
32	Laydown area 2 (Tubatse Koppie)	Workshop 1 (floor)	A3	Future infrastructure	To remain	Closure	400mm concrete structure	*Including washbay*	27	18.3	0.4	197.64	0	0	750.69	R 0.00
33	Laydown area 2 (Tubatse Koppie)	Workshop 1 (Container with tools and spares)	A3	Future infrastructure	To be removed	Closure	Temporary office 6m		1	1	1	1	0	0	2848.33	R 0.00
34	Laydown area 2 (Tubatse Koppie)	Workshop 1 (Container with tools and spares)	A3	Future infrastructure	To be removed	Closure	Temporary office 6m		1	1	1	1	0	0	2848.33	R 0.00
35	Laydown area 2 (Tubatse Koppie)	Core yard and green area / training facility	A4	Future infrastructure	To remain	Closure	Single storey double brick building		9	13.6	1	122.4	0	0	494.43	R 0.00
36	Laydown area 2 (Tubatse Koppie)	Change house area	A5	Future infrastructure	To remain	Closure	Single storey double brick building		6.95	5.17	1	35.9315	0	0	494.43	R 0.00
37	Laydown area 2 (Tubatse Koppie)	Admin facilities: office, kitchen and ablution	A6	Future infrastructure	To remain	Closure	Single storey double brick building		6.22	14.98	1	93.1756	0	0	494.43	R 0.00
38	Laydown area 2 (Tubatse Koppie)	Toilets	A7	Future infrastructure	To remain	Closure	French drain		1	1	1	1	0	0	13662.15	R 0.00
39	Laydown area 2 (Tubatse Koppie)	Admin facilities: Main boardroom	A7	Future infrastructure	To remain	Closure	Single storey double brick building		6.65	6.6	1	43.89	0	0	494.43	R 0.00
40	Laydown area 2 (Tubatse Koppie)	Admin facilities: Geology and logistics office	A8	Future infrastructure	To be removed	Closure	Temporary office 6m		1	1	1	1	0	0	2848.33	R 0.00
41	Laydown area 2 (Tubatse Koppie)	Admin facilities: Site Manager office	A9	Future infrastructure	To be removed	Closure	Temporary office 6m		1	1	1	1	0	0	2848.33	R 0.00
42	Laydown area 2 (Tubatse Koppie)	Admin facilities: Mine Manager/ Pit Manager office	A10	Future infrastructure	To be removed	Closure	Temporary office 12m		1	1	1	1	0	0	3808.03	R 0.00
43	Laydown area 2 (Tubatse Koppie)	Admin facilities: Survey office	A11	Future infrastructure	To be removed	Closure	Temporary office 6m		1	1	1	1	0	0	2848.33	R 0.00
44	Laydown area 2 (Tubatse Koppie)	Admin facilities: Spares storage	A12	Future infrastructure	To be removed	Closure	Temporary office 6m		1	1	1	1	0	0	2848.33	R 0.00
45	Laydown area 2 (Tubatse Koppie)	Light plant undercover parking	A13	Future infrastructure	To remain	Closure	Light steel		1	1	1	1	0	0	68.38	R 0.00
46	Laydown area 2 (Tubatse Koppie)	On site clinic	A14	Future infrastructure	To remain	Closure	Single storey double brick building		8.32	5	1	41.6	0	0	494.43	R 0.00

47	Laydown area 2 (Tubatse Koppie)	Fence surrounding office complex		Future infrastructure	To remain	Closure	Dismantling fences 1.8m Mesh		216.14	1	1	216.14	0	0	30.79	R 0.00
48	Laydown area 2 (Tubatse Koppie)	Parking area	A15	Future infrastructure	To remain	Closure	Light steel		11.75	11.83	1	139.0025	0	0	68.38	R 0.00
49	Laydown area 2 (Tubatse Koppie)	Parking area	A16	Future infrastructure	To remain	Closure	Light steel		23.16	6.25	1	144.75	0	0	68.38	R 0.00
50	Laydown area 2 (Tubatse Koppie)	Bulk hazardous substance storage (Diesel); oil trap and sump	A17	Future infrastructure	To be demolished	Closure	Fuel pumps & tanks	*3 Diesel tanks & pump: 31.85 m3 per tank - assumed to include the fuel and lubricant store*	95.55	1	1	95.55	0	0	6695.75	R 0.00
51	Laydown area 2 (Tubatse Koppie)	Bulk hazardous substance storage facility	A17	Future infrastructure	To remain	Closure	340mm concrete structures	*Bunded area surrounding and next to the fuel tanks*	18	9	0.34	55.08	0	0	741.57	R 0.00
52	Laydown area 2 (Tubatse Koppie)	Diesel generator plant	A18	Future infrastructure	To remain	Closure	Single storey double brick building		3.24	3.64	1	11.7936	0	0	494.43	R 0.00
53	Laydown area 2 (Tubatse Koppie)	Spare tool shed (unused)	A21	Future infrastructure	To be removed	Closure	Temporary office 6m		1	1	1	1	0	0	2848.33	R 0.00
54	Laydown area 2 (Tubatse Koppie)	Air filter storage for drill rigs (removed from site)	A23	Future infrastructure	To be removed	Closure	Temporary office 6m		1	1	1	1	0	0	2848.33	R 0.00
55	Laydown area 2 (Tubatse Koppie)	Air filter storage for drill rigs (removed from site)	A24	Future infrastructure	To be removed	Closure	Temporary office 6m		1	1	1	1	0	0	2848.33	R 0.00
56	Laydown area 2 (Tubatse Koppie)	Weighbridge office	A29	Future infrastructure	To be removed	Closure	Temporary office 6m		1	1	1	1	0	0	2848.33	R 0.00
57	Laydown area 2 (Tubatse Koppie)	Goose neck filling point for water cart	A19	Future infrastructure	To be demolished	Closure	250mm concrete structure		1.8	1.7	0.25	0.765	0	0	673.1	R 0.00
58	Laydown area 2 (Tubatse Koppie)	Water pump house	A19	Future infrastructure	To remain	Closure	Light steel		2	2	1	4	0	0	68.38	R 0.00
59	Laydown area 2 (Tubatse Koppie)	Water storage facilities (2 x 10 000 l Jojo tanks)	A19	Future infrastructure	To remain	Closure	Water tanks		10	1	1	10	0	0	6695.75	R 0.00
60	Laydown area 2 (Tubatse Koppie)	Water storage facilities (2 x 5000 l Jojo tanks)	A19	Future infrastructure	To be removed	Closure	Water tanks		5	1	1	5	0	0	6695.75	R 0.00
61	Laydown area 2 (Tubatse Koppie)	Fencing		Future infrastructure	To remain	Closure	Dismantling fences 1.8m Mesh	*Fence around laydown area (not including fence leading to weighbridge)*	908	1	1	908	0	0	30.79	R 0.00
															TOTAL	**R0.00**

Table 8: Calculation for future closure (Biophysical Components)

No.	Main area	Description	Item no. (map)	Status	Objective	Implementation phase	Rate category	Note / Comment	L	W	H	Size (m / m² / m³)	Number / other/ factor	Total Size	Rates	Final cost
1	Laydown area 1 (Klarinet Koppie)	Laydown area (incl. ROM Stockpile 1)	A2	Operational	To remain	Closure	Ripping	Whole laydown area - including the ROM 1 stockpile footprint The Community have requested that the stockpile areas be left intact for future cattle kraals.	184	215	1	39560	0	0	14.89	R 0.00
2	Laydown area 1 (Klarinet Koppie)	Laydown area (incl. ROM Stockpile 1)	A2	Operational	To remain	Closure	Seeding	The Community have requested that the stockpile areas be left intact for future cattle kraals.	184	215	1	39560	0	0	11.95	R 0.00
3	Laydown area 1 (Klarinet Koppie)	Weighbridge	A28	Operational	To be re-vegetated	Closure	Weigh bridges		38.5	4.75	1	182.875	1	182.875	950.69	R 173 857.43
4	Laydown area 1 (Klarinet Koppie)	Berms along fences	A30	Operational	To make safe	Closure	Dump levelling: Bulldozer	Only berms around laydown area 1 considered - assumption is made that the berms have been constructed from topsoil. At closure topsoil will be used to level the area alongside the berm	832.94	1	1	832.94	1	832.94	41.98	R 34 966.82
5	Laydown area 2 (Tubatse Koppie)	Laydown area	A2	Future infrastructure	To remain	Closure	Ripping	Structures which Community wish to take ownership of	92	107	1	9844	0	0	14.89	R 0.00
6	Laydown area 2 (Tubatse Koppie)	Laydown area	A2	Future infrastructure	To remain	Closure	Seeding	Structures which Community wish to take ownership of	92	107	1	9844	0	0	11.95	R 0.00
7	Laydown area 2 (Tubatse Koppie)	Berms along fences	A30	Future infrastructure	To make safe	Closure	Dump levelling: Bulldozer	Only berms around laydown area 2 considered - assumption is made that the berms have been constructed from topsoil. At closure topsoil will be used to level the area alongside the berm	500	1	1	500	1	500	41.98	R 20 990.00
8	Mine wide	Haul Roads	A20	Operational	To remain	Closure	Ripping	From operations (Phase 1) to Laydown area 2 Double road The Community have requested that the access & haul roads remain present	575	14	1	8050	0	0	14.89	R 0.00
9	Mine wide	Haul Roads	A20	Operational	To remain	Closure	Seeding	The Community have requested that the access & haul roads remain present	575	14	1	8050	0	0	11.95	R 0.00
10	Mine wide	ROM Stockpile 3	A25	Operational	To remain	Closure	Ripping	The Community have requested that the stockpile areas be left intact for future cattle kraals.	152.4	94	1	14325.6	0	0	14.89	R 0.00
11	Mine wide	ROM Stockpile 3	A25	Operational	To remain	Closure	Seeding	The Community have requested that the stockpile areas be left intact for future cattle kraals.	152.4	94	1	14325.6	0	0	11.95	R 0.00
12	Mine wide	ROM Stockpile 2	A26	Operational	To remain	Closure	Ripping	The Community have requested that the stockpile areas be left intact for future cattle kraals.	116	175.3	1	20334.8	0	0	14.89	R 0.00

13	Mine wide	ROM Stockpile 2	A26	Operational	To remain	Closure	Seeding	The Community have requested that the stockpile areas be left intact for future cattle kraals.	116	175.3	1	20334.8	0	0	11.95	R 0.00
14	Mine wide	ROM Stockpile 4	A27	Operational	To remain	Closure	Ripping	Assumption: Stockpile North of the pit To be rehabilitated	29107	1	1	29107	1	29107	14.89	R 433 403.23
15	Mine wide	ROM Stockpile 4	A27	Operational	To remain	Closure	Seeding	Assumption: Stockpile North of the pit To be rehabilitated	29107	1	1	29107	1	29107	11.95	R 347 828.65
16	Mine wide	Overburden areas next to Phase 1 pit		Operational	To be re-vegetated	Closure	Seeding		9120	1	1	9120	1	9120	11.95	R 108 984.00
17	Mine wide	Phase 1 Open pit - Klarinet Koppie		Operational	To make safe	Closure	Backfilling of pit	Mining areas 1/2/3/4: volume required for fill: 657503 m3	657503	1	1	657503	1	657503	7.12	R 4 681 421.36
18	Mine wide	Phase 1 Open pit - Klarinet Koppie		Operational	To be re-vegetated	Closure	Seeding	5.1 ha	51000	1	1	51000	1	51000	11.95	R 609 450.00
19	Mine wide	Phase 2 Open pit - Tubatse Koppie		To be implemented	To be re-vegetated	Closure	Seeding	8.89	88900	1	1	88900	1	88900	11.95	R 1 062 355.00
20	Mine wide	Phase 3 Open pit - Spitskop plains		To be implemented	To be re-vegetated	Closure	Seeding	10.26	102600	1	1	102600	1	102600	11.95	R 1 226 070.00
															TOTAL	**R8 699 326.49**

Appendix 2 – External Financial review letter

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Fourie + Botha

Geregistreerde Ouditeure
Registered Auditors
Geoktrooieerde Rekenmeesters(SA)
Chartered Accountants (SA)

18 March 2016

Shangoni Management Services (Pty) Ltd

e-mail : jan@shangoni.co.za / anika@shangoni.co.za

Verification of financial information

Dear Jan / Anika,

I refer to your e-mail sent on 17 March 2016 where you requested that we verified the correctness of certain financial information.

We also received an excel spread sheet with these information.

We performed the following procedures :

- We verified that correctness of all of the cells where formulas were used on sheets number 4 - 10;
- we verified that the rates used in sheets number 2 and 3 were correctly carried forward to sheets number 4 - 10. We did not verify every rate but the ones that we did verify were correct; and
- on sheet number 6 and 9 we verified that the totals were correctly carried over from sheets number 4 - 10.

We did not verify the data that was used in the information and therefore do not express any assurance on the correctness of these data.

Yours faithfully

FOURIE + BOTHA

Per :

Praktyk Nr / Practice No
930229

Vennote / Partners
EHK Botha, WM Fourie, MA Eastman

Appendix 3 – Community Agreement