25 APPENDIX G: REHABILITATION, DECOMMISSIONING AND CLOSURE PLAN

Final Rehabilitation, Decommissioning and Mine Closure Plan

Including Environmental Risk Assessment

Kasimira Trading 82 (Pty) Ltd

DMR REF: NC 30/5/1/2/2/10194 MR

Farm Wolfberg 187, Nama Khoi Local Municipality, Namakwa District Municipality, Northern Cape

Contents

1 Introduction

1.1 Background

This document serves to comply with regulation 11(1) of the NEMA Financial Regulations that states that the holder of a right or permit must ensure that a review is undertaken of the requirements for final rehabilitation, decommissioning and closure of the prospecting, exploration, mining or production operations at the end of the life of operations as reflected in a Final Rehabilitation, Decommission and Mine Closure Plan ; and 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.

The objectives of this Final Rehabilitation, Decommission and Mine Closure Plan is to identify a post-mining land use that is feasible through-

- providing the vision (goals), objectives, targets and criteria for final rehabilitation, decommissioning and closure of the project;
- outlining the design principles for closure;
- explaining the risk assessment approach and outcomes and link closure activities to risk rehabilitation;
- detailing the closure actions that clearly indicate the measures that will be taken to mitigate and/or manage identified risks and describes the nature of residual risks that will need to be monitored and managed post closure;
- committing to a schedule, budget, roles and responsibilities for final rehabilitation, decommissioning and closure of each relevant activity or item of infrastructure;
- identifying knowledge gaps and how these will be addressed and filled;
- detailing the full closure costs for the life of project at increasing levels of accuracy as the project develops and approaches closure in line with the final land use proposed; and
- outlining monitoring, auditing and reporting requirements.

1.2 Issues that have guided the development of the plan

Three approaches were employed to identify the key aims for the closure process that form part of the approved Final Closure Plan submitted and approved in terms of the MPRDA:

- Technical assessments which involved the recording of the project activities over the full life cycle of the mining operation (including closure) and the consequent potential impacts on the environment (including cumulative impacts). This resulted in the compilation of a draft Closure Plan that facilitated discussions with the authorities as well as Interested and Affected Parties (I&APs).
- Identification and consultation with the relevant authorities to record their requirements as well as public meetings with I&APs to solicit/record their suggestions/issues/concerns.
- The collection of available/published environmental data, the review thereof for adequacy and hence the identification of the need for more comprehensive environmental studies/investigations and/or further information gathering.

Subsequent to the above activities/processes, advertisements of the mining operation were placed in local newspapers to notify I&AP's about the intended project and invitations to register and participate in the consultation process. As a result of the consultation and recommendations from the comprehensive environmental studies/investigations completed the company identified three key closure goals for the final closure of the mining operation that are listed below.

- To create a safe and healthy post-mining environment with no residual environmental impact.
- To create a stable, free draining post mining landform, which is compatible with the surrounding landscape, and which is capable of a productive land use that achieves a land capability equal to that of pre-mining conditions
- To provide optimal pre-mining social opportunities

Each goal is supported by a suite of key objectives and activities which are elaborated on in section 2 and 3 of this plan. This plan also describes how these objectives are planned to be met and elaborate on the implementation of certain risk mitigation actions (section 5). With risk assessment and mitigation being integral to the planning and executing of the rehabilitation and closure of the mine. Aftercare and maintenance of rehabilitated sites is often the difference between the ultimate successes or failure of rehabilitation and monitoring of rehabilitation will determine whether rehabilitation objectives and requirements are being achieved (section 0).

1.3 Context of the Wolfberg Mining operation

1.3.1 Mining rights

The mining area consist of the Farm Wolfberg 187 situated in the Namakwa District Municipality and Nama Khoi local authority of the Namakwa administrative district of the Northern Cape. Wolfberg is situated approximately 60km west of Springbok and 40km east of Kleinzee, with the Springbok-Kleinzee Road (the R355) running right through the middle of it. The approximate centre of the mining area is Latitude S29.26301° and Longitude E16.90010° (Figure 1).

1.3.2 Project Description

The mineral mined for is diamonds alluvial. The Wolfberg Diamond Mine lies in the heart of the world-renowned Namaqualand Diamond District, bordered by the colossal De Beers Namaqualand Mines diamond works at Kleinzee to the west, and the enormous Alexkor diamond works at Alexander Bay to the north. Farther afield Trans Hex have mined diamonds on a massive scale along the Lower Orange River and Namdeb (De Beers) have produced millions of carats from the Southern Namibian beaches.

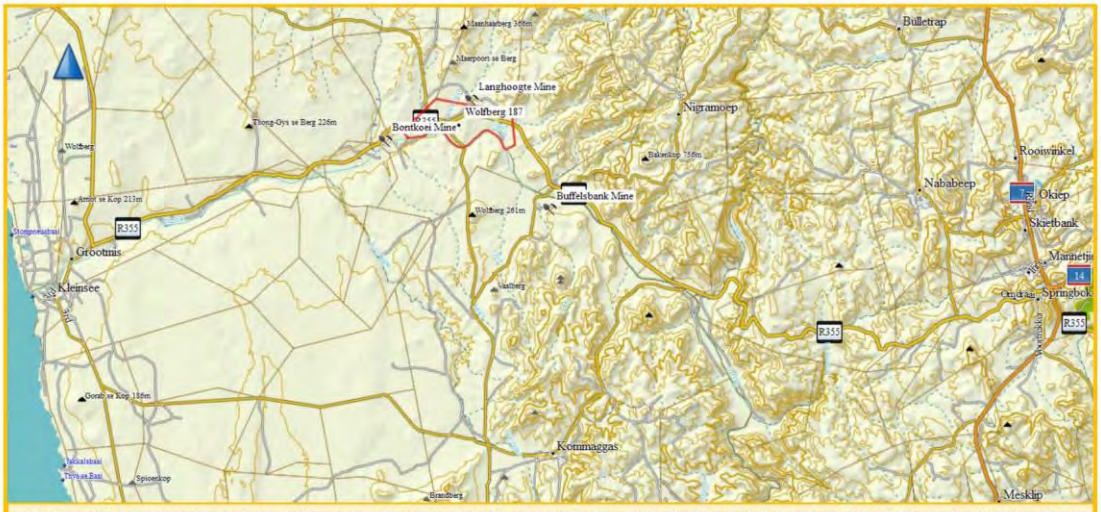
The ~ 140km stretch of coast between Alexander Bay and Kleinzee with adjacent emerged marine terraces has been the mainstay of the Namaqualand alluvial diamond district for the greatest part of the twentieth century. Although this immense wealth has mainly been mined out by 2008, a considerable proportion of viable deposits remains and is still being mined on a fairly substantial scale. Due to the sheer scale and abundance of viable deposits, the first and foremost focus has for decades been on the central deposits surrounding the Buffels and Orange River mouths. However, through further study of the drainage patterns, several adjacent deposits which have been known but escaped scrutiny until recently are now regarded as the conduits and main contributors to many of the rich central deposits.

Numerous mining operators have produced diamonds at Wolfberg since 1959 and up to the present time, most notably Nama Diamante, then the MP for Namaqualand Daantjie Scholtz since early sixties, then his son-in-law the attorney Christo de Wit since middle seventies, Tom Honiball since early eighties (largest stone = 14.7 carats), Pauli Nel since 1985 (largest stone = 20 carats), Monty Scheckter of Carrigs Ltd since 1987, Rex Minerals since 1990, Doppies Mostert 1993-1994 and Sarel Lombard late nineties.

Since the year 2000 a number of smaller operators have produced diamonds on Wolfberg. According to these sources' grades of up to 300 carats per 100 tonnes have been obtained from the richer parts of the Wolfberg diamond deposits. Top production yielded up to 400 carats per day and up to R12 million worth of diamonds have been produced in a single year during the mid-eighties. These verbal reports seem to be confirmed by the substantial amounts of material including large boulders (>1m) which have been moved during the past decades of mining. Most of these excavations have been left open, and provide valuable geological and historical information on the Wolfberg diamond deposits and their exploitation

The total area allocated for mining consists of the complete Farm Wolfberg 187 (SG code C05300000000018700000) with a total extend of 2199.5742Ha. The property is registered in the name of the Right holder Kasimira Trading 82 (Pty) Ltd by virtue of Title deed T14819/2012

Due to the numerous historic mining activities the area was divided in 8 blocks to facilitate annual rehabilitation as well as final decommissioning (Figure 2). Transformation within the 8 Mining Blocks range from between 10 to 75% transformation.



Wolfberg Mine is situated approximately 60km west of Springbok and 40km east of Kleinzee, with the Springbok-Kleinzee road (the R355) running right through the middle of it.

Figure 1: Locality of the Wolfberg Mine

Block 1 ±125HA 0.4% transformed, 6.5% surface disturbance, 93% virgin area or natuaral restoration
Block 2 ±378Ha 3.2% transformed, 0.4% surface disturbance, 96% virgin area or natuaral restoration
Block 3 ±405Ha 0.6% transformed, 0% surface disturbance, 99.4% virgin area or natuaral restoration
Block 4 ±947Ha 0% transformed, 1% surface disturbance, 99% virgin area or natuaral restoration
Block 5 ±118Ha 0% transformed, 0% surface disturbance, 100% virgin area or natuaral restoration
Block 6 ± 63Ha 3% transformed, 2% surface disturbance, 95% virgin area or natuaral restoration
Block 7 ±83Ha 8.5% transformed, 10.5% surface disturbance, 81% virgin area or natuaral restoration
Block 8 ±81Ha 70% transformed, 20% surface disturbance, 10% virgin area or natuaral restoration

Figure 2: Layout of different Mining Blocks for rehabilitation purposes

1.3.3 Mine design maps

Wolfberg is situated approximately 60km west of Springbok and 40km east of Kleinzee, with the Springbok-Kleinzee road (the R355) running right through the middle of it (Figure 1, page 3).

Several secondary roads servicing the mining areas provide excellent access to all parts of the Wolfberg Mine. The mining area are accessible on generally negotiable farm roads.

The nearby coastal town of Kleinzee offers all the logistics needed by this operation therefore development of infrastructure will be minimal.

Wolfberg lies in the Lower Buffels River Valley, which forms part of the vast coastal plain between the Namaqualand Metamorphic Mountainland and the West Coast of South Africa. The road from Springbok descends impressively from the escarpment into the valley below via the Spektakel Pass (Figure 3).

Figure 3: Westward view across the Lower Buffels River Valley from Spektakel Pass.

1.3.4 Project layout

For decommissioning purposes, the mining area is divided in 8 Mining Blocks (Figure 2, page 4). The different project component is described below and summarised per block in Table 1 and Table 2, page 27 and indicated on Figure 37 (page 30) to Figure 45 (page 38).

Servitudes

There are a road and water pipeline servitude registered on the property.

Services

- Access and service roads

Access to the mine workings is via the R355 main road and duel use public road system (Figure 1 & Figure 2). Existing tracks will be used, and new tracks must be restricted to the absolute minimum.

- Water supply

Water supply is from bore holes on the property and stored in a cement reservoir at the final recovery plant.

- Electrical supply

Although high voltage power lines run across the prospect, no end-user electricity outlet is available.

Electrical supply to the processing plant and logistics will be generated by mobile gensets to be supplied with generator bay and spill prevention measures with collection sump.

Waste Management

- Maintenance of Solid waste management systems
  - Salvage yard for temporary storage of scrap steel prior to sale to be demarcated and the footprint contained.
  - Laydown and Parking area for equipment to be demarcated and provided with drip trays for stationary equipment and the footprint contained.
  - Domestic waste to be collected in municipal refuse bags, sealed in plastic containers and transported weekly to the municipal refuse site.
  - Solid waste to be stored in a temporary waste storage area provided with concreted floors and bund walls before transport to disposal facilities in one of the towns on a monthly basis (Figure 4).
  - Contaminated/used spares, filters and used oil are collected and stored in special containers which are also placed in the bunded temporary waste storage area for disposal at a registered disposal site (Figure 4).

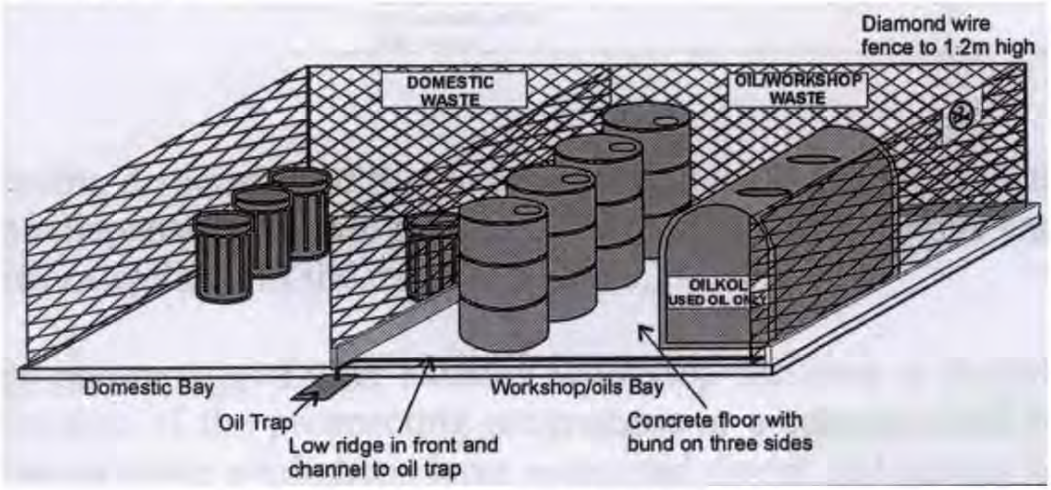


Figure 4: Proposed layout of temporary waste storage area

- Maintenance of Water pollution management facilities
  - Fine residue dams (FRD) – to be developed within existing excavations. This FRD will act as settling dams from where water is recycled.
  - Pollution control dams and evaporation dams – due to the extremely low rainfall, high evaporation rate, permeability of the soils, the use of French drains and the lack of pollutants used in the mining process, no storm water management system nor pollution control/evaporation dams will be required.
  - Polluted water treatment facilities - there are no pollutants other than oil and diesel used in the mining operation. As such no polluted water treatment facility is provided.
- Maintenance Oil/grease/diesel management system
  - Oil and Grease (new and used) will be stored in a secure storage area to be provided with concreted floors and bund walls as spill prevention measures.
  - Bulk fuel supply to be provided with a bund wall and service apron with spill prevention measures and collection sump.
  - Parking area for mobile diesel bowser 10 000 litre with bunded parking

Infrastructure

Refer summary Table 1, page 27

- Accommodation
  - Accommodation is available at Kleinzee
  - The limited number of workers residing on the mine is making use of farm infrastructure that will be upgraded and maintained by the mine and remain as part of farm improvement.
  - Historic ruins and foundations not to be recommissioned will be demolished as part of duty of care. This include all ruins and the explosives magazine (Figure 44 & Figure 5 and Figure 6).
  - The ruins at the old farmstead will be demolished as part of duty of care (Figure 40 & Figure 7 & Figure 8).
  - All storage areas and waste management facilities will be developed as part of farm improvement.
  - Refer to the summary in Table 1, page 27.

- Processing Plant

  The Primary gravels are subjected to 'in-pit' screening to -48 mm and transported by ADT's to the diamond recovery plant where it is stored on the plant feed stockpile. Stockpile material is then fed to the plant using a front-end loader, tipping the material into the plant feed bin. A 14' Foot Rotary pan with a production capacity (ROM) of 40 Tons per Hour will be used (Figure 9). The tailings from the pan (overflow) discharges continually onto an individual dewatering screen, coarse residue (CR) discharges onto common transfer conveyor and the screen undersize and slurry (FR) reports to a central sump. The slurry is pumped directly to the mine FRD within existing excavations. The CR tailings are also dumped into the relevant open excavations as part of the on-going rehabilitation process.

  The concentrate recovered from the rotary pan will go over a de-watering screen in order to remove all sand and the remaining material will go through a pleitz jig from where it will be hand sorted and diamonds recovered. The jigs effected a further 42 per cent reduction of the bulk. Refer to the summary in Table 1, page 27.

Figure 5: Ruins to be recommissioned or demolished

Figure 6: Explosives magazine to be recommissioned or demolished

Figure 7: Old farmstead to be demolished and rubble removed

Figure 8: Building rubble to be removed

Figure 9: Mobile pan plant to be used

Historic mining disturbance and new mining excavations planned

Refer summary Table 2, page 27

8

- **Mining Block 1** Figure 38 **(page 31)**

No excavations that will be cleaned and bedrock swept for processing of gravels

No waste dumps to be processed and backfilled by means of loading and hauling

No waste dumps to be shaped or backfilled by means of dozing

Surface disturbances due to historic mining activities to be investigated with regard to natural restoration and if necessary ripped and profiled with erosion control measures:

- Surface disturbance (SD 3) with locality S29.53895° E17.37028° ~5.17Ha
- Surface disturbance (SD 4) with locality S29.54076° E17.36312° ~0.5Ha
- Surface disturbance (SD 5) with locality S29.53831° E17.37736° ~5.17Ha

Mining of targets identified as part of exploration (Figure 10 and Figure 11, **page 9-10**)

- Target 2 (T2) S29.52997° E17.37426° "Staanhoek" (~5000m² x 1m deep) giving an excavation volume of ~5 000m³ or 13 000 tons at a Sg of 2.6. With mineralization of ~20%, 3000 tons diamondiferous gravel as ROM and 80%- or 10000-tons overburden and topsoil will be backfilled as part of concurrent rehabilitation.

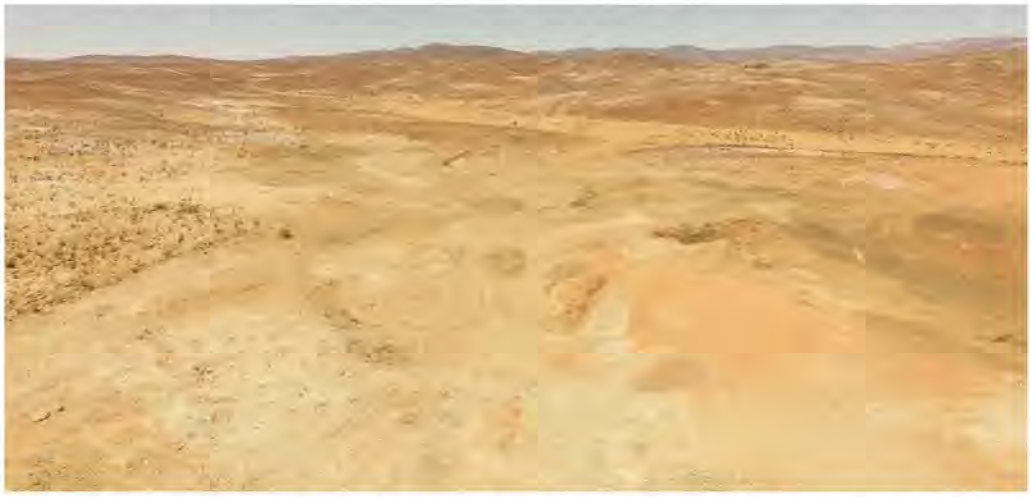


Figure 10: Staanhoek Target 2 (SD 1), showing shallow surface mining up to the boundary fence with Farm Staanhoek.

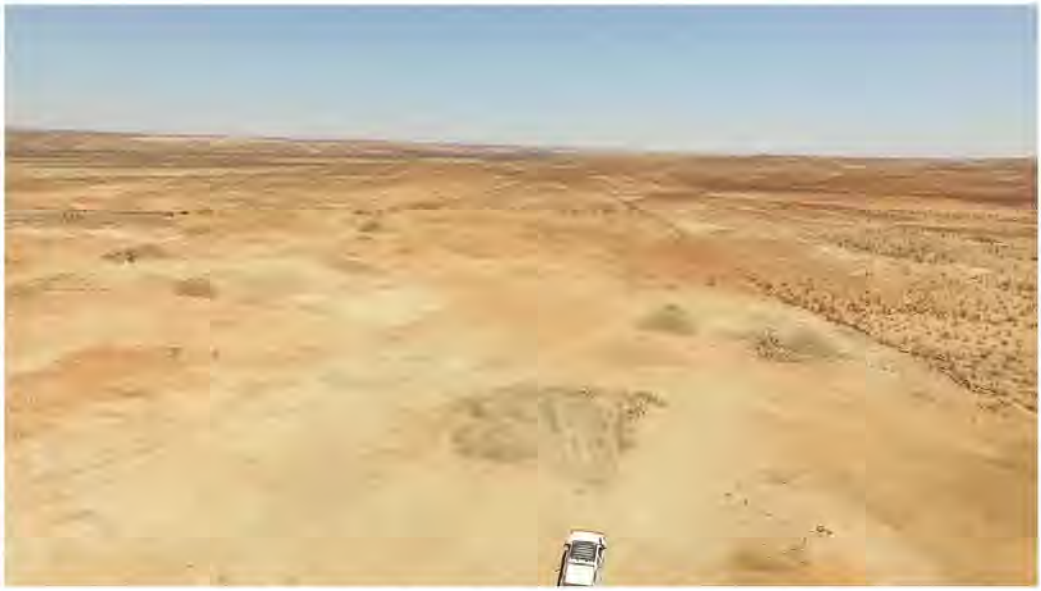


Figure 11: Staanhoek Target 2 (SD 1), showing shallow strip mining

- **Mining Block 2** Figure 39 **(page 32)**

No excavations that will be cleaned and bedrock swept for processing of gravels. Only one excavation to be backfilled and profile:

- Boulder pit (EX 9) at the old plant area with locality S29.52924° E17.40524° ~0.7Ha

No waste dumps to be processed and backfilled by means of loading and hauling.

Waste dumps to be shaped or backfilled by means of dozing include the temporary overburden dumps at the old plant area needs to backfilled in the Boulder pit (EX 9)

- Overburden dump (OD 8) at old plant with locality S29.52864° E17.40582° ~0.7Ha

Surface disturbances due to historic mining activities to be investigated with regard to natural restoration and if necessary ripped and profiled with erosion control measures:

- Salvage yard and laydown area (IS 1) at living quarters to be decommissioned with locality S29.52773° E17.40502° ~0.34Ha
- Surface disturbance (SD 8) with locality S29.52599° E17.40173° ~0.5Ha

Mining of targets identified as part of exploration (Figure 10, 11 and 12)

- Target 4 (T4) S29.53247° E17.39086° "Rooihoop" (~17500m² x 1m deep) giving an excavation volume of ~17500m³ or 45500 tons at a Sg of 2.6. With mineralization of ~20%, 9000 tons diamondiferous gravel will be available as ROM and 80%- or 36500-tons overburden and topsoil will be backfilled as part of concurrent rehabilitation. The maximum footprint of the mining area including historic surface disturbances to be investigated with regard to natural restoration and if necessary profiled with erosion control measures will be 9.5Ha.

Figure 12: Target 4 (SD 2), showing numerous shallow bulldozed mining trenches across a relatively large area.

Figure 13: Target 4 showing the so-called "Rooihoop" gravel stockpile against the backdrop of the Henkries-Kleinzee water pipeline.

Figure 14: Target 4 (SD 2), showing pebble-sized tailings from historic gravel processing.

- **Mining Block 3 Figure 40 (page 33)**

No excavations that will be cleaned and bedrock swept for processing of gravels.

No waste dumps to be processed and backfilled by means of loading and hauling.

No waste dumps to be shaped or backfilled by means of dozing.

No surface disturbances due to historic mining activities to be investigated with regard to natural restoration and if necessary ripped and profiled with erosion control measures.

Mining of targets identified as part of exploration (Figure 15 & Figure 16)

- Target 3 (T3) S29.54042° E17.37994° (~15000m² x 1m deep) giving an excavation volume of ~15 000m³ or 39 000 tons at a Sg of 2.6. With mineralization of ~20%, 7000 tons diamondiferous gravel will be available as ROM and 80%- or 32000-tons overburden and topsoil will be backfilled as part of concurrent rehabilitation. The maximum footprint of the mining area including historic surface disturbances to be investigated with regard to natural restoration and if necessary profiled with erosion control measures will be 0.35Ha (Figure 15).
- Target 5 (T5) S29.53938° E17.38951° "Cross Roads" (~7000m² x 1m ellipsoid) giving an excavation volume of ~7000m³ or 18200 tons at a Sg of 2.6. With mineralization of ~20%, 3600 tons diamondiferous gravel will be available as ROM and 80%- or 14600-tons overburden and topsoil will be backfilled as part of concurrent rehabilitation. The maximum footprint of the mining area including historic surface disturbances to be investigated with regard to natural restoration and if necessary profiled with erosion control measures will be 2Ha (Figure 16).

Figure 15: Bulldozed trench Target 3 during mining operations

Figure 16: Bulldozed trench Target 3 during mining operations

- **Mining Block 4** Figure 41 **(page 34)**

No excavations that will be cleaned and bedrock swept for processing of gravels.

No waste dumps to be processed and backfilled by means of loading and hauling.

No waste dumps to be shaped or backfilled by means of dozing.

13

Surface disturbances due to historic mining activities to be investigated with regard to natural restoration and if necessary ripped and profiled with erosion control measures:

- Farmstead ruins to be demolished 120m³ and areas cleaned with locality S29.54325° E17.43630° ~0.2Ha
- Cement reservoir to be upgraded and maintained with locality S29.53505° E17.41425° ~0.1Ha
- Surface disturbance (SD 7) with locality S29.54158° E17.39557° ~8Ha (Figure 17 & Figure 18)

No mining is planned for this mining block.

- Further exploration of the virgin area to be undertaken as a last priority by means of mining pits 5X5 meter 2-meter-deep. A maximum of 20 pits will be dug along 5 traverses. Virgin areas for prospecting pits and rehabilitation 20 X 50m³ = 1000 m³. Disturbed area to be to be profiled 8Ha. Pits to be backfilled and profiled (Figure 19)

Figure 17: Overburden dumps to be profiled

Figure 18: Excavation to be backfilled and profiled

Figure 19: Exploration pits to be backfilled

- **Mining Block 5** Figure 42 **(page 35)**

This block covers an area of 118Ha and can be regarded as virgin area with some historic disturbances where restoration has taken place naturally over time.

No excavations that will be cleaned and bedrock swept for processing of gravels.

No waste dumps to be processed and backfilled by means of loading and hauling.

No waste dumps to be shaped or backfilled by means of dozing.

No surface disturbances due to historic mining activities to be investigated with regard to natural restoration and if necessary ripped and profiled with erosion control measures.

No mining is planned for this mining block.

- **Mining Block 6** Figure 43 **(page 36)**

This block covers an area of 63Ha of which 3% is transformed and needs backfilling by means of hauling and a further 2% medium disturbance that only needs profiling. The rest of the area 95% can be regarded as virgin area with some historic disturbances where restoration has taken place naturally over time.

Two excavations are present that will be cleaned, bedrock swept and the gravel processes by in pit screening and processing.

- Excavations (EX 1) with locality S29.529280° E17.425128° ~0.3Ha.
- Excavations (EX 2) with locality S29.532129° E17.428003° ~0.15Ha.

Waste dumps adjacent to be the excavations to be processed and backfilled by means of loading and hauling.

✓ An estimated 2 000m³ overburden dumps needs to be backfilled by means of loading and hauling (Figure 20)
- Overburden Dump (OD 1) with locality S29.528715° E17.425459°~0.14Ha.
- Overburden Dump (OD 2) with locality S29.532278° E17.427603°~0.3Ha.

Surface disturbances due to historic mining activities to be investigated with regard to natural restoration and if necessary, waste dumps to be shaped or backfilled by means of dozing and compacted area ripped and profiled with erosion control measures.

✓ An estimated 3Ha surface disturbance needs to be levelled and profiled (Figure 21)
- Surface disturbance (SD 10) with locality S29.532308° E17.426320° ~3Ha

Mining of targets identified as part of exploration (Figure 22, **page 17)**

- New Bulk sample (BS 4) S29.52899° E17.43137° (~5000m² x Im deep) giving an excavation volume of ~5 000m³ or 13 000 tons at a Sg of 2.6. With mineralization of ~20%, 3000 tons diamondiferous gravel will be available as ROM and 80%- or 10000-tons overburden and topsoil will be backfilled as part of concurrent rehabilitation. The maximum footprint of the sampling area will be 1Ha and an estimated 5 000 m³ excavations needs be backfilled and profiled by means of dozing of the adjacent waste dumps.

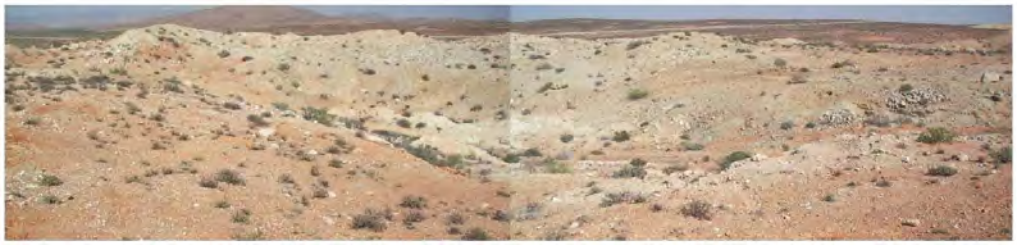


Figure 20: Excavation to be backfilled and profiled by means of dozing

Figure 21: Historic dumps partially re-vegetated to be profiled no backfilling

16

Figure 22: **Target 6b to be backfilled and profiled by means of dozing**

17

- **Mining Block 7** Figure 44 **(page 37)**

Three excavations are present that will be cleaned, bedrock swept and the gravel processes by in pit screening and processing.

✓ An estimated 7 000 m³ excavations needs to be backfilled and profiled by means of dozing (Figure 23 & Figure 24)
  - Excavations (EX 6) with locality S29.529999° E17.412073° ~0.6Ha.
  - Excavations (EX 7) Louwtjie se Gat with locality S29.527070° E17.411530° ~0.4Ha.
  - Excavations (EX 8) Boulder Pit with locality S29.530720° E17.407170° ~1.6Ha.

Waste dumps adjacent to be the excavations to be processed and backfilled by means of dozing.

✓ An estimated 5 000m³ overburden dumps and waste rock needs to be backfilled by means of loading and hauling (Figure 25 & Figure 26)
  - Overburden Dump (OD 6) with locality S29.529170° E17.412407° ~1.3Ha.
  - Overburden Dump (OD 7) with locality S29.527185° E17.412591° ~0.3Ha.

Surface disturbances due to historic mining activities to be investigated with regard to natural restoration and if necessary, waste dumps to be shaped or backfilled by means of dozing and compacted area ripped and profiled with erosion control measures.

✓ An estimated 16Ha surface disturbance needs to be levelled and profiled (Figure 26 & Figure 29).
  - Surface disturbance (SD 13) with locality S29.530577° E17.412616° ~0.72Ha
  - Surface disturbance (SD 14) with locality S29.528106° E17.411519° ~4.28Ha
  - Surface disturbance (SD 15) with locality S29.526277° E17.412029°~1.28Ha
  - Surface disturbance (SD 16) with locality S-29.528874° E17.408336° ~0.26Ha

No mining is planned for this mining block. If any gravels are encountered within the virgin areas under the overburden dumps after backfilling this plan will be amended to provide for the mining area Target 1(T1).

Figure 23: Excavation to be backfilled by means of dozing

Figure 24: Overburden dumps to be backfilled by means of dozing into existing excavation

19

Figure 25: Overburden dumps to be backfilled by means of loading and hauling

Figure 26: Surface disturbance to be levelled and profiled

20

Figure 27: Surface disturbance to be levelled and profiled

Figure 28: Surface disturbance to be levelled and profiled

21

Figure 29: Surface disturbance to be levelled and profiled

22

- **Mining Block 8** Figure 45 **(page 38)**

All excavations will be cleaned, bedrock swept and the gravel processes by in pit screening and processing.

✓ An estimated 80 000 m^3 excavations needs to be backfilled and profiled by means of dozing (Figure 30 & Figure 31)
  - Excavations (EX 3) ~9Ha ± 60 000 m^3
  - Excavations (EX 4) ~3Ha ±10 000 m^3
  - Excavations (EX 5) ~2Ha ±10 000 m^3

Waste dumps adjacent to be the excavations to be processed and backfilled by means of dozing.

✓ An estimated 3 000m^3 waste rock needs to be backfilled by means of loading and hauling (Figure 32).
✓ An estimated 100 000m^3 overburden dumps needs to be backfilled by means of dozing (Figure 33 & Figure 34).
  - Overburden Dump (OD 3) ~2Ha.
  - Overburden Dump (OD 4) ~6Ha.
  - Overburden Dump (OD 5) ~1Ha.
  - Overburden Dump (OD 6) ~10Ha.

Surface disturbances due to historic mining activities to be investigated with regard to natural restoration and if necessary, waste dumps to be shaped or backfilled by means of dozing and compacted area ripped and profiled with erosion control measures.

✓ An estimated 8Ha surface disturbance needs to be levelled and profiled (Figure 35 & Figure 36).
  - Surface disturbance (SD 11) ~4Ha
  - Surface disturbance (SD 12) ~4Ha

No further mining is planned. If any gravels are encountered within the virgin areas under the overburden dumps after backfilling the plan will be amended to provide for the bulk sample.

No mining is planned for this mining block except for processing of ex situ calcified gravel blocks Target 7 (T7) and historic tailings Target 8 (T8).

Figure 30: 14 Ha Excavations to be profiled by means of dozing

Figure 31: Panoramic view of excavation 4 and overburden dumps 3 to be profiled by means of dozing

24

Figure 32: Sandstone boulders to be loaded hauled and backfilled

Figure 33: Overburden dumps to be backfilled by means of loading and hauling

25

Figure 34: Surface disturbance to be levelled and profiled

Figure 35: Surface disturbance to be levelled and profiled

Figure 36: Surface disturbance to be levelled and profiled

26

Table 1: Environmental liabilities with regard to infrastructure

Mining Block	Activity	Footprint & Liabilities
Infrastructure	Development /upgrading or demolishing and rehabilitation of infrastructure processing areas and services. Minimal infrastructure will be developed due to the close proximity of the Kleinzee settlement and available of infrastructure developed as part of farm improvement.	
Block 1 Figure 38	No infrastructure	No infrastructure
Block 2 Figure 39	Living quarters S29.52805° E17.40577° Generator Bay S29.52805° E17.40577° Salvage Yard S29.52773° E17.40502° Plant and stockpile area S29.52864° E17.40582°	0.2Ha maintain as part of farm improvement 0.1Ha upgrade with spill prevention measures 0.4Ha demolish clean and rip compacted areas 1.5Ha remove stockpiles and backfill in boulder pit
Block 3 Figure 40	No infrastructure	No infrastructure
Block 4 Figure 41	Cement reservoir S29.53505° E17.41425° Farmstead ruins S29.54325° E17.43630°	0.1Ha maintain as part of farm improvement 2Ha demolish clean and rip compacted areas
Block 5 Figure 42	No infrastructure	No infrastructure
Block 6 Figure 43	No infrastructure	No infrastructure
Block 7 Figure 44	Living quarters/site office S29.52862° E17.41257° Generator Bay S29.52862° E17.41257° Bulk fuel supply S29.52862° E17.41257°	0.2Ha maintain as part of farm improvement 0.1Ha upgrade with spill prevention measures Provide service apron with spill prevention
Block 8 Figure 45	Salvage Yard S29.52864° E17.41861° Laydown & Parking area Waste storage (Fig 2) Secure storage Service and Wash bay Bio-cell (soil farm) Explosives magazine S29.52902° E17.42209°	demarcate, concentrate scrap and housekeeping demarcate and drip trays demarcate, signage and spill prevention demarcate, signage and spill prevention develop with spill prevention and collection sump develop and maintain 40m³ demolished and rehabilitated

Table 2: Environmental liabilities with regard to historic disturbances

Block 1 Figure 38	Excavations to be cleaned backfilled and profile Waste dumps processed & backfilled hauling Waste dumps backfilled dozing Surface disturbance profiled rip compacted area SD 3 S29.53895° E17.37028° SD 4 S29.54076° E17.36312° SD 5 S29.53831° E17.37736°	None None None 5.17Ha 0.5Ha 0.37Ha

27

4b Block 2 Figure 39	Excavations to be cleaned backfilled and profile EX 9 "Boulder pit" S29.52924° E17.40524° Waste dumps processed & backfilled hauling OD 8 S29.52864° E17.40582° Waste dumps backfilled dozing Surface disturbance to be to be profiled IS 1 "Salvage yard" S29.52773° E17.40502° SD 8 S29.52599° E17.40173°	 ~0.7Ha ~0.7Ha ±3 000 m³ None 0.34Ha 0.5Ha
4c Block 3 Figure 40	Excavations to be cleaned backfilled and profile Waste dumps processed & backfilled hauling Waste dumps backfilled dozing Surface disturbance to be to be profiled	None None None None
4d Block 4 Figure 41	Excavations to be cleaned backfilled and profile Waste dumps processed & backfilled hauling Waste dumps backfilled dozing Surface disturbance to be to be profiled IS 3 Ruins S29.54325° E17.43630° SD 7 S29.54158° E17.39557°	None None None 0.2Ha ±120m³ demolish and backfill rubble 8Ha
4e Block 5 Figure 42	Excavations to be cleaned backfilled and profile Waste dumps processed & backfilled hauling Waste dumps backfilled dozing Surface disturbance to be to be profiled	None None None None
4f Block 6 Figure 43	Excavations to be cleaned backfilled and profile EX 1 S29.529280° E17.425128° EX 2 S29.532129° E17.428003° Waste dumps processed & backfilled hauling OD 1 S29.528715° E17.42546° OD 2 S29.532278° E17.42760° Waste dumps backfilled dozing Surface disturbance to be to be profiled SD 10 S29.53230° E17.42632°	 0.3 Ha in pit screening and processing. 0.15 Ha in pit screening and processing. 0.14 Ha ±10 000 m³ 0.03 Ha ±5 000 m³ None 3Ha
4g Block 7 Figure 44	Excavations to be cleaned backfilled and profile EX 6 S29.529999° E17.412073° EX 7 S29.527070° E17.411530° EX 8 S29.530720° E17.407170° Waste dumps processed & backfilled hauling Waste dumps backfilled dozing OD 6 S29.529170° E17.412407° OD 7 S29.527185° E17.412591°	 0.6Ha in pit screening and processing. 0.4Ha in pit screening and processing. 1.6Ha in pit screening and processing. None ~1.3Ha ±10 000 m³ ~0.3Ha ±5 000 m³

28

	Surface disturbance to be to be profiled SD 13 S29.530577° E17.412616° SD 14 S29.528106° E17.411519° SD 15 S29.526277° E17.412029° SD 16 S29.528874° E17.408336°	 ~0.72Ha ~4.28Ha ~1.28Ha ~0.26Ha
4h Block 8 Figure 45	Excavations to be cleaned backfilled and profile EX 3 EX 4 EX 5 Waste dumps processed & backfilled hauling OD 4 OD 5 Waste dumps backfilled dozing OD 3 OD 6 Surface disturbance to be to be profiled SD 11 SD 12	 ~9Ha in pit screening and processing. ~3Ha in pit screening and processing. ~2Ha in pit screening and processing. ~6Ha ±5 000m³ ~1Ha ±1 000m³ ~2Ha ±20 000m³ ~10Ha ±80 000m³ ~4Ha ~4Ha

29

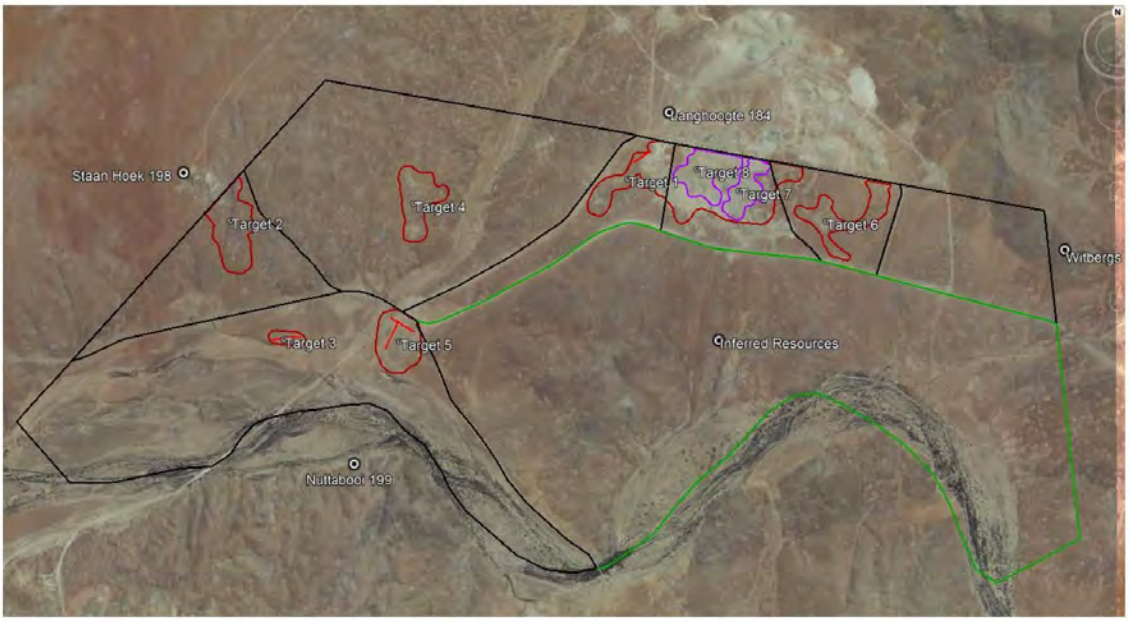


Figure 37: Layout with location of mining targets as part of mining operation

30

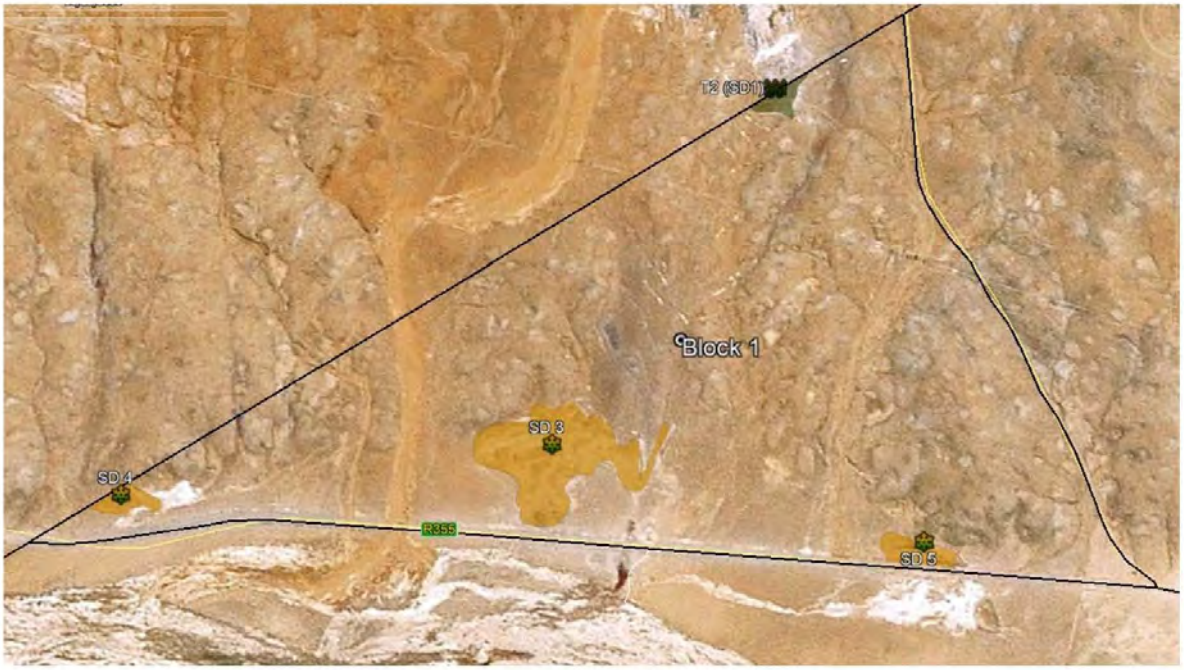


Figure 38: Layout with location of surface disturbance Mining Block 1

31

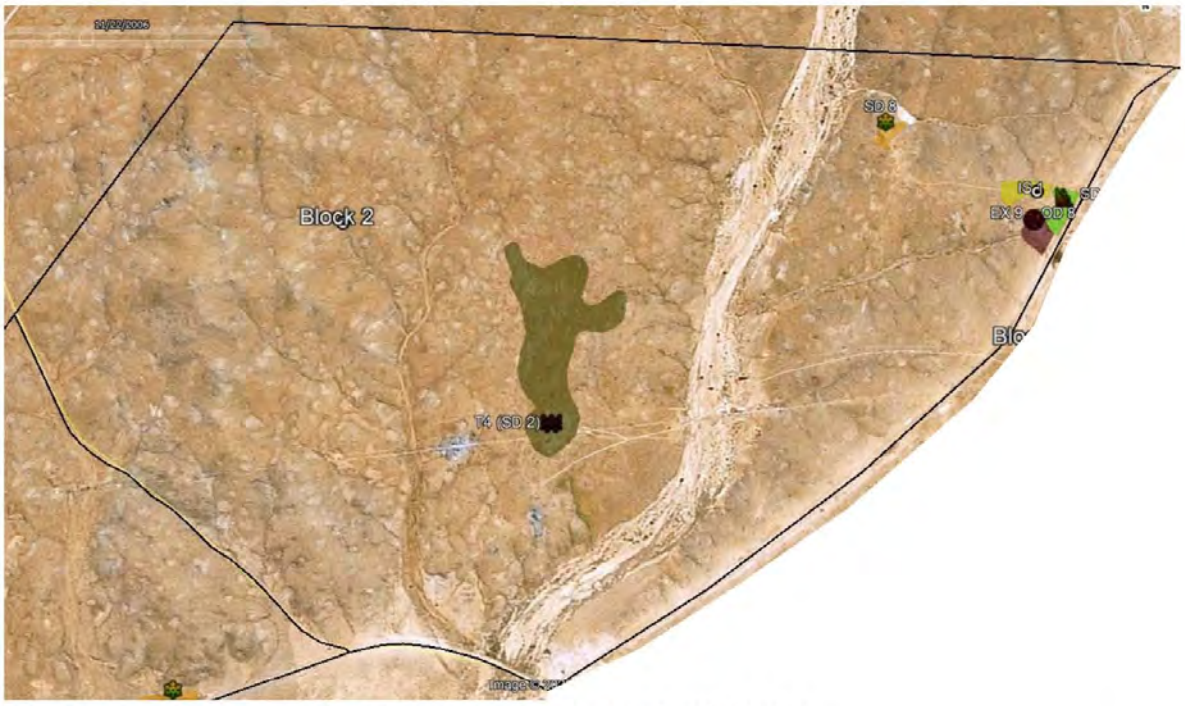


Figure 39: Layout with location of surface disturbance Mining Block 2

32

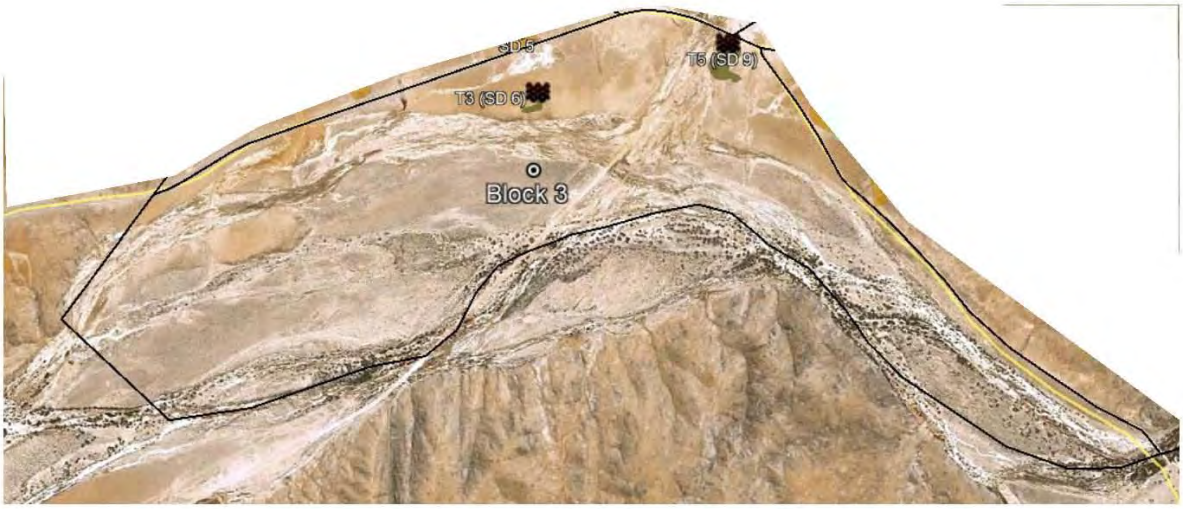


Figure 40: Layout with location of surface disturbance Mining Block 3

33

Figure 41: Layout with location of surface disturbance Mining Block 4

34

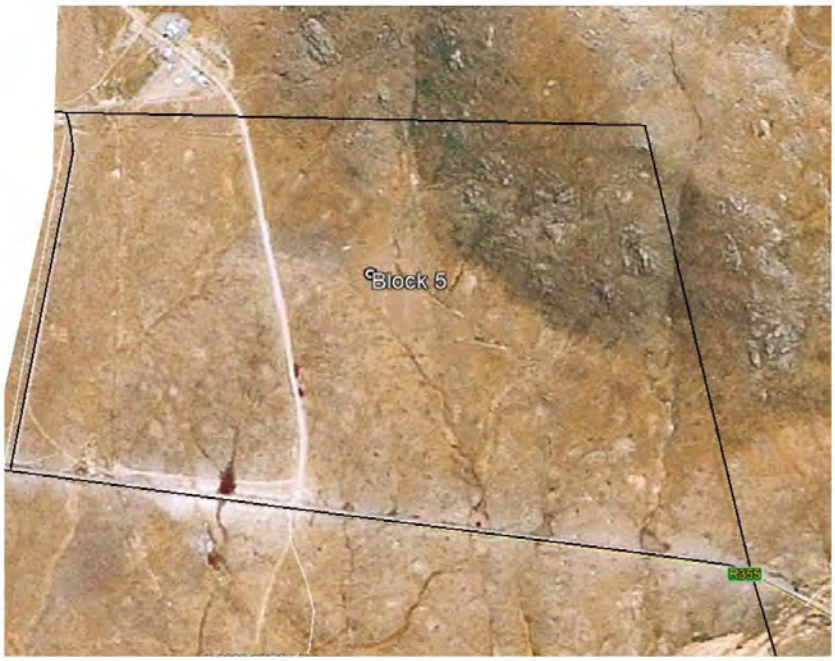


Figure 42: Layout with location of surface disturbance Mining Block 5

35

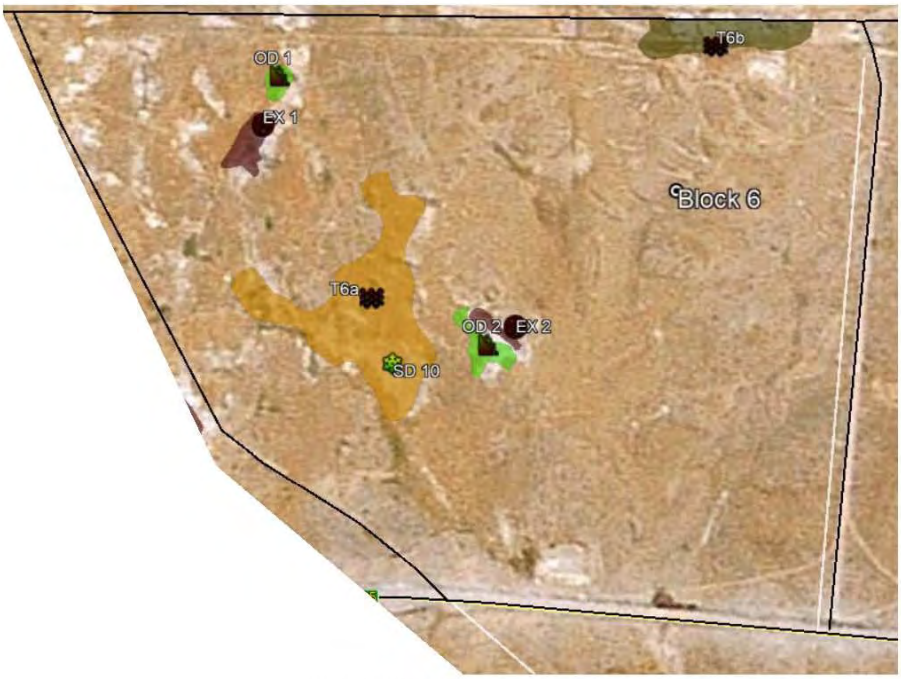


Figure 43: Layout with location of surface disturbance Mining Block 6

36

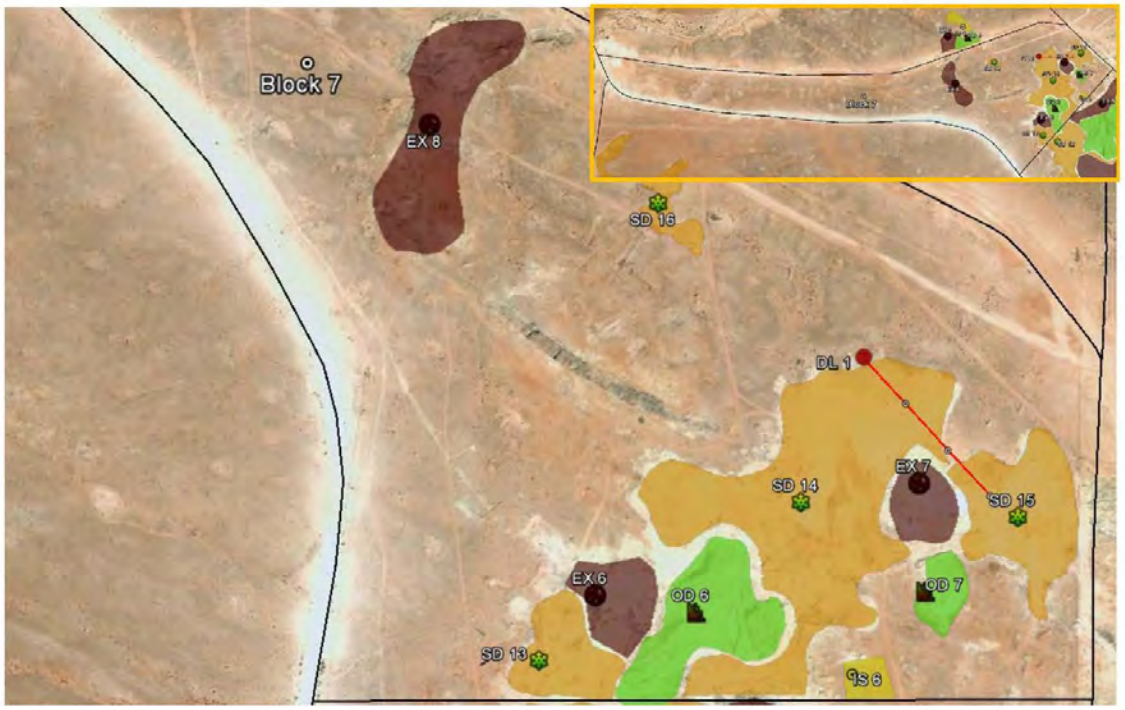


Figure 44: Layout with location of surface disturbance Mining Block 7

37

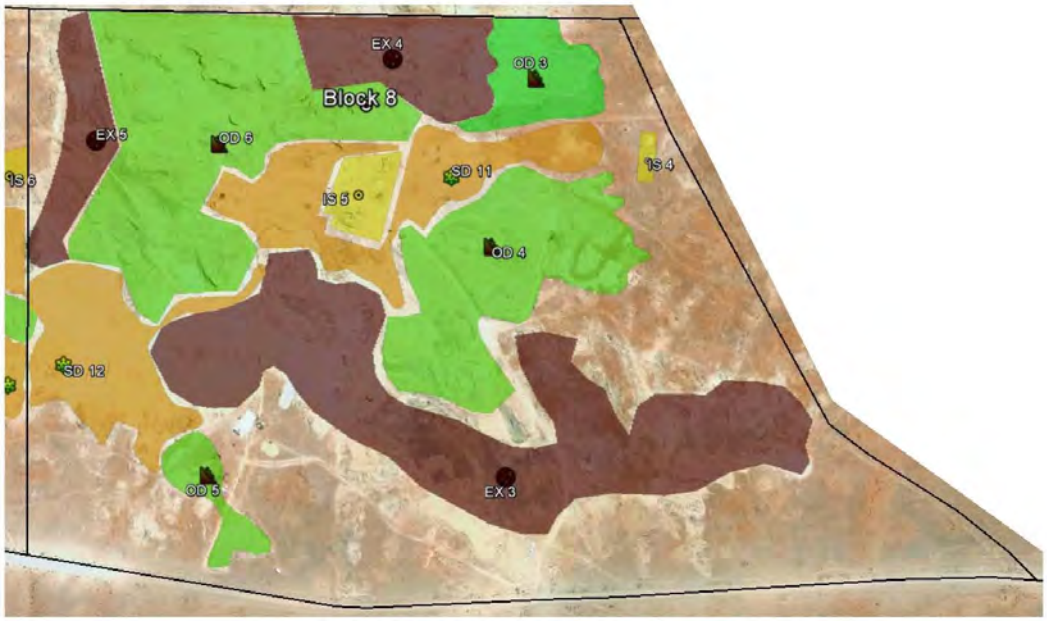


Figure 45: Layout with location of surface disturbance Mining Block 8

38

2 Regulatory Requirements

This document serves to comply with regulations 9 and 11 of the NEMA Financial Regulations and the objective of this Final Rehabilitation, Decommission and Mine Closure Plan is to identify a post-mining land use that is feasible through-

- providing the vision, objectives, targets and criteria for final rehabilitation, decommissioning and closure of the project;
- outlining the design principles for closure;
- explaining the risk assessment approach and outcomes and link closure activities to risk rehabilitation;
- detailing the closure actions that clearly indicate the measures that will be taken to mitigate and/or manage identified risks and describes the nature of residual risks that will need to be monitored and managed post closure;
- committing to a schedule, budget, roles and responsibilities for final rehabilitation, decommissioning and closure of each relevant activity or item of infrastructure;
- identifying knowledge gaps and how these will be addressed and filled;
- detailing the full closure costs for the life of project at increasing levels of accuracy as the project develops and approaches closure in line with the final land use proposed; and
- outlining monitoring, auditing and reporting requirements.

Several pieces of legislation are applicable to mine closure. Importantly, public participation is an integral part of mine closure and the process followed needs to fulfil the requirements of all relevant legislation. The following government departments have been identified amongst others as playing a key role in the closure process:

- Department of Minerals Resources (DMR). Lead agent, facilitator of closure inspections and issues the closure certificate,
- Department of Water and Sanitation (DWAS). Lead agent for potential water related issues and signs off on the mine closure certificate. Cancellation of Water Use license.
- Provincial Department of Environment and Nature Conservation (DENC). Gives input into the Closure Plan and guides and monitors protection of the natural environment.
- The local municipality and district municipality. Gives input into the Mine Closure Plan and interfacing thereof with their Integrated Development Plan (IDP) of the local area.

2.1 Wolfberg Environmental Authorisation (EA) requirements

The requirement as per the Environmental Authorisation (EA) is that after mining, the site must be rehabilitated to its original land use or agreed to land use in this case a solar farm. The closure objectives below are in agreement with the post mining land use. The objectives to meet the set goals as applied to the final decommissioning and mine closure discussed in section 3 below can be summarised as follow:

- Objective 1 - To create a safe and healthy post-mining environment
  - Safe excavations
    - Slope stability of remaining excavation
    - No potentially dangerous areas; secured if required
  - Limited residual environmental impact
    - No surface and/or groundwater contamination
    - Waste management practices not creating or leaving legacies
    - Develop a landscape that reduces the requirement for long term monitoring and management
- Objective 2 - To create a stable, free draining post mining landform, which is compatible with the surrounding landscape
  - Economically viable and sustainable land fit for grazing, as close as possible to its natural state.
    - Improve Land use with an increased production with regard to grazing.

- Prepare area to promote natural re-establishment of vegetation that is self-sustaining, perpetual and provides a sustainable habitat for local fauna and successive flora species

- Objective 3 – To provide optimal post-mining social opportunities
  - Optimised benefits for the social environment
  - Minimal negative aesthetic impact

40

3 Final Decommissioning and Closure of Wolfberg Dump Prospect

Concurrent or progressive rehabilitation is good practice and has advantages for the company as it reduces its overall financial exposure. Concurrent rehabilitation and remediation are provided for in the annual rehabilitation plan and contain information that defines activities on an annual basis and how these relate to the Final closure vision, as detailed in this Final Rehabilitation, Decommission and Mine Closure Plan. Annual reviews in terms of regulations 6(a) and 11(1)(a) of the NEMA Financial Regulations, that form part of the Annual Environmental Audit, assesses what closure objectives and criteria are being achieved through the implementation of the plan.

Areas that are not covered during concurrent rehabilitation as described in the Annual Rehabilitation Plan, that require specific intervention as part of this Final Rehabilitation, Decommission and Mine Closure Plan are discussed below.

3.1 Mining Area

3.1.1 Basic rehabilitation methodology

Re-vegetation of the disturbed areas will follow a process of natural plant succession starting with pioneer plants

Post mining topography for most of the area will follows the original landform shape except where changes due to historic excavations and other land use on the area has occurred that will not form part of the environmental responsibilities of the applicant.

The main closure objective therefore is to leave the site in as safe and self-sustaining a condition as possible and in a situation where no post-closure intervention is required. The aim is to ensure that the affected environment is maintained in a stable condition that will not be detrimental to the safety and health of humans and animals and that will not pollute the environment or lead to the degradation thereof. The aesthetic value of the area will also be reinstated.

The basic rehabilitation methodology will therefore only include reinstating the original profile of the natural topography. Post mining topography for the area will follows the original landform shape. No waste dumps will be created above surface.

3.1.2 Risk sources

The risk sources within the different mining blocks with quantification are provided below and summarized in Table 1 and Table 2, page 27 and indicated in the mine layout plans Figure 38 to Figure 45.

- Opencast workings (including final voids and ramps)
- Residue deposits overburden and spoils
- Surface disturbance

3.1.3 Risk Identification

The risks arising from these sources are listed below according to the closure objectives and the impact rating and mitigation actions of each risk are addressed in the risk assessment.

- Risks with regard to creating a Safe mining area
  - No significant risks were identified.
  - Insignificant risks relate to
    - Affected environment not in a stable condition can be detrimental to the safety and health of humans and animals.
    - Collapsing slope(s) of trenches.
    - Potentially dangerous areas like trenches or fine residue dumps.
    - Unsafe erosion gulley's

- Uncontrolled access to a potentially unsafe post-mining area

- Risk of residual environmental impact
  - No significant risks were identified.
  - Insignificant risks relate to
    - Post mining landscape that increases the requirement for long term monitoring and management.
    - Equipment and other items used during the mining operation left behind.
    - Stockpiles and leftover product left behind
    - Oil fuel leaks onto virgin soil through the earthmoving and transport mobile plant
    - The spillage of fuel during transfer from fuel bowser to equipment in the field
- Risks with regard to changes in land use
  - No significant risks were identified.
  - Insignificant risks relate to
    - Uncontrolled expansion of mining footprint by not restricting the area disturbed by mining and the associated activities/infrastructure - loss of land with agricultural potential
    - Post mining topography not compatible with original landform. Trenches not backfilled.
    - Unstable post mining landform, which is not compatible with the surrounding landscape and which is capable of an unproductive land use that cannot achieve a land capability equal to that of pre-mining conditions
    - Long term changes in land use that cannot revert back to mainly small stock farming (grazing) caused by not implementing prompt rehabilitation and maintenance of disturbances when possible.
    - Disturbance of ecology due to loss of habitat.
    - Soil compaction due to hauling and development of stockpiles- limiting agricultural potential.
    - Uncontrolled development of roads and new roads not kept to a minimum - existing farm roads not used for mining operations.
    - Redundant internal roads left behind.
    - Duel used roads still needed by the landowner and fences not maintained or repaired.
- Risks with regard to benefits for the social environment
  - No significant risks were identified.
  - Insignificant risks relate to
    - Staff losing their jobs
    - Job losses of secondary industries, businesses and contractors
    - Contractual agreements with service providers surpassing mine closure date
    - Closure standards not accepted and/or are changing
    - Mine closure being jeopardised by other land uses
    - Poorly defined transition from mining to farming activities within different legislation
    - No positive and transparent relationships with stakeholders and not maintaining communication channels – not providing stakeholders including government authorities with relevant information as per legislative requirements.
    - Not undertaking environmental management according to approved EMPr and plans and no auditing of the environmental management system.
    - Mine closure stalled due to non-compliance with South African legislation (national, provincial and local)
    - Insufficient funds for complete rehabilitation
- Risks with regard to aesthetic impact
  - No significant risks were identified.
  - Insignificant risks relate to
    - Visual disturbance from the public road views – excavations or overburden dumps blocking the view

- Incomplete removal of waste - waste classes not kept in separate streams
- Nuisance effects of air emissions (dust) no implementation and maintenance of dust monitoring programs accompanied by dust suppression activities if required.
- Noise disturbance and light pollution as a result of night activities.

3.2 Processing and Logistics area

3.2.1 Basic rehabilitation methodology

The main post closure objective for the logistical and processing area is to leave the site in as safe and self-sustaining a condition as possible and in a situation where no post-closure intervention is required. The aim is to ensure that the affected environment is maintained in a stable condition that will not be detrimental to the safety and health of humans and animals and that will not pollute the environment or lead to the degradation thereof. The aesthetic value of the area will also be reinstated.

The general approach adopted is the complete removal of all infrastructure and equipment. The processing plant and associated buildings and services will be removed from the site. The general approach adopted is to reuse all infrastructures and equipment at another location by the company. Redundant structures, buildings and civil foundations (down to one meter below surface for subsurface infrastructure) will be removed for use elsewhere or demolished and discarded. All steel structures and reinforcing including the processing plant will be discarded or sold as scrap. Building rubble will be backfilled into excavations and covered with overburden. The compacted salvage yard, lay down and movement areas will be screened for petrochemical spills and cleaned before it is ripped and levelled. All redundant water pipes, pumps, power lines and cable associated with raw water supply will be removed. Service roads needs to be maintained and handed over to the landowner in a good state of repair and all redundant fences needs to be removed. All temporary waste storage areas need to be cleaned out and waste removed. Waste material of any description, including receptacles, scrap, rubble and tyres, will be removed entirely from the complete mining area and disposed of at a recognised landfill facility. It will not be buried or burned on the site.

3.2.2 Risk sources

The risk sources within the processing and logistical area with quantification are provided below and summarized in Table 1 and Table 2, page 27 and shown in the mine layout plans Figure 38 to Figure 44

Processing plant and related structures

The proposed use of a mobile plant is deemed sufficient to handle the proposed rate of processing. The small scale & mobility of the plant also reduces environmental impact in that decommissioning costs are reduced, and the plant can be re-used on another operation.

Infrastructure

No steel or reinforced concrete buildings and structures are present on the mining area that will require demolition.

Services and associated infrastructure are limited to process water supply and storage consisting of plastic tanks that can be re-used on another operation.

Underground water reticulation laid-on to the mine work area to feed water to the plant.

One concrete generator bay is provided for a portable generator as power supply.

As part of waste management facilities, a salvage yard and temporary waste storage is provided.

The service roads will remain as part of farm improvement and the mine is only responsible for the maintenance of the road.

Residue deposits overburden and spoils

Coarse tailings (Plant spoils)

Fine tailings

Surface disturbance

An area of 1.5Ha will be used as processing plant and logistics and another 0.5Ha as temporary product and residue deposit before backfilled into the excavations.

3.2.3 Risk Identification

The risks arising from these sources are listed below and the impact rating and mitigation actions of each risk is addressed in the risk assessment.

- Risks with regard to creating a Safe mining area
  - No significant risks were identified.
  - Insignificant risks relate to
    - Affected environment not in a stable condition can be detrimental to the safety and health of humans and animals.
    - Fine residue dam not in a stable condition
    - Potentially dangerous areas like equipment left behind.
- Risk of residual environmental impact
  - No significant risks were identified.
  - Insignificant risks relate to
    - Post mining landscape that increases the requirement for long term monitoring and management.
    - Waste management practices creating or leaving legacies.
    - Sub-surface infrastructure remaining behind, limiting the intended post closure land use. Power supply and water installations including pumps and pipelines except for potable water.
    - Rubble from demolished infrastructure left behind due to the absence of excavations in the mining process.
    - Equipment and other items used during the mining operation left behind.
    - Incomplete removal of re-usable infrastructure.
    - Infrastructure to remain in terms of agreements with the landowner not maintained.
    - Waste classes not kept in separate streams
    - Incomplete removal of waste
    - Fine residue dam not in a stable condition
    - Stockpiles and leftover product left behind
    - Oil fuel leaks onto virgin soil through the earthmoving and transport mobile plant
- Risks with regard to changes in land use
  - No significant risks were identified.
  - The insignificant risks are the same as for the mining area
- Risks with regard to benefits for the social environment
  - No significant risks were identified.
  - The insignificant risks are the same as for the mining area
- Risks with regard to aesthetic impact
  - No significant risks were identified.
  - The insignificant risks are the same as for the mining area

4 Aftercare and Maintenance

Maintenance of rehabilitated sites is often the difference between the ultimate successes or failure of rehabilitation and monitoring of rehabilitation will determine whether rehabilitation objectives and requirements are being achieved.

As the final phase in the project cycle, decommissioning may present positive environmental opportunities associated with the return of the land for alternative use and the cessation of impacts associated with operational activities. However, depending on the nature of the operational activity, the need to manage risks and potential residual impacts may remain well after operations have ceased. Examples of potential residual impacts and risks include erosion, slow recovery of vegetation, stock that has been abandoned (e.g., oil drums, scrap equipment) and old (unserviceable) structures.

The main closure objective is to hand back the rehabilitated properties to the respective landowners in a state that is fit for grazing, as close as possible to the original carrying capacity and to ensure that the affected environment is maintained in a stable condition that will not be detrimental to the safety and health of humans and animals and that will not pollute the environment or lead to the degradation thereof. The rehabilitation strategy is based on reinstating the original profile of the landscape. The aim therefore is to leave the site in as safe and self-sustaining a condition as possible and in a situation where no post-closure intervention is required.

Due to the specific nature of the mining operation no aftercare and maintenance were identified except for monitoring of erosion event over a period of 2 years.

5 Risk Assessment

5.1 Risk sources

5.1.1 Infrastructure and Logistics areas

- Access and Haul Roads
  - Access from the HQ to the mine workings is via a duel use public road system and existing farm tracks.
  - Existing tracks will be used as haul roads and will only be upgraded to facilitate haul trucks by applying dust suppression and/or hardening compound such as Macadamite.
  - The service roads will remain as part of farm improvement and the mine is only responsible for the maintenance of the road.
- Services and associated infrastructure
  - Potable and process water are obtained and pumped from the boreholes present on site.
  - Storage consisting of a 45 000-litre plastic tank that can be re-used on another operation.
  - A collection sump for the recycling of process water used to wash tailings, if possible.
  - Electrical supply for the processing is generated by mobile gensets supplied with generator bay and spill prevention measures.
  - Underground water reticulation laid-on to the mine work area to feed water to the logistics.
- Accommodation and Logistics
  - Development and upgrading of infrastructure and waste management facilities are still in progress.
  - No steel or reinforced concrete buildings and structures are present on the mining area that will require demolition.
  - All waste rock structures used as part of accommodation, site office and secure storage needs to be demolished and waste blocks buried together with any remaining cement floors or footings.
  - Structures in the form of prefabricated buildings including the fuel tank that can be re-used on another location must be removed from site
  - The cement structures for the fuel supply including service aprons needs to be demolished together with any remaining cement floors or footings.
- Waste management facilities
  - As part of waste management facilities, a salvage yard, laydown area with parking and temporary waste storage facilities will be provided.
  - Domestic waste is collected in plastic containers and transported weekly to the municipal refuse site.
  - Petrochemical and hazardous waste including contaminated/used spares, filters and used oil are collected and stored in special containers with spill containment measures for disposal at a registered disposal site.
  - The workshop area needs to be upgraded with a temporary waste storage area, bio cell and laydown area
  - Domestic waste is collected in plastic containers and transported weekly to the municipal refuse site.
  - Petrochemical and hazardous waste including contaminated/used spares, filters and used oil are collected and stored in special containers with spill containment measures for disposal at a registered disposal site.
- Oil/grease/diesel management systems
  - The service and wash bay at the infrastructure area will be used.
  - The fuel supply tank is provided at the infrastructure area and fuel is trucked onto the site for the generators and equipment.
  - The fuel truck must be provided with a parking area with spill containment measures.
  - The generators must be supplied with generator bays with spill containment measures.

5.1.2 Pits, tailings, and waste dumps

- Opencast workings (including final voids and ramps)
  - Deep unsafe excavations not backfilled
- Residue deposits overburden and spoils
  - The only spoils to be generated are the volumes of rocks after screening.
  - Only one waste dump needs to be created per bulk excavation and the creation of secondary waste dumps must be prevented by regularly moving waste to the designated areas.
  - The existing waste dumps will be used during new operations
  - Secondary waste dumps need to be shaped and rehabilitated as part of the annual rehabilitation plan.
- Surface disturbance (compacted areas)
  - The stockpile and dispatch area for gravel together with the sorting and stockpile area for gravel needs to be demarcated and the footprint contained.
  - Regular sorting and dispatch of gravel to be done as part of housekeeping.
  - Demarcation needs to be removed to the demarcated waste dump at final closure.
  - The sorting area together with stockpile area for gravel to be ripped and profiled with erosion control measures.

5.2 Risk Identification

The potential risks arising from the mining operation are generic for any diamond mining and listed below. The impact rating of applicable risks and mitigation actions are addressed in the risk assessment section below.

5.2.1 Potential Risks with regard to safe excavations and changes in topography

- The change in topography from mining activities would be slight depressions created in the landscape. These depressions would be minimal as only 1% is taken for final recovery.
- The tailings are returned to the trenches for backfilling. The 1% will backfilled in the historical pit, and will fill 10% of this historical excavation, should there be 10 sample trenches.
- Potentially dangerous areas like deep mine pit or equipment left behind and uncontrolled access to a potentially unsafe post-mining area
- Post-mining topography not compatible with original landform.
- Unsafe erosion gulley's

5.2.2 Potential Risks associated with mining.

- Safety of personnel operating large earth-moving equipment.
- Management of dust, noise and vibration associated with mining activities, in relation to surrounding communities.
- Potentially dangerous areas like excavations or equipment left behind and uncontrolled access to potentially unsafe post-mining areas.

5.2.3 Potential risk of environmental impacts

- Disturbance to sensitive environments such as land with historical or conservation value, watercourses, terrestrial habitats, fauna and flora and any associated biodiversity corridors, and on high potential agricultural land.
- Potential contamination of groundwater from tailings, unmanaged use of hydrocarbons on-site, and incorrect storage of hazardous substances.
- Waste classes are not kept in separate streams and incomplete removal of waste.
- Stockpiles and leftover products remaining after mining.
- Loss of indigenous vegetation due to disturbed footprints at mining sites.
- Increased soil erosion causing loss of topsoil.

- Climate change causing an increase in temperature and decrease in rainfall, reducing vegetation cover leading to wind-blown soil erosion.
- Dust generation from unsurfaced roads.
- Chemical contaminants impacting surface and/or groundwater quality or resulting in discharge that exceeds the concentrations permitted.
- Vehicle wash bays and workshop facilities produce petrochemical and solvent contaminated runoff.
- Sanitary conveniences, fuel depots or storage facilities of potentially polluting substances can contaminate surface water.
- Oil fuel leaks onto soil through the earthmoving and transport equipment and machinery or spillage of fuel during the transfer from fuel bowser to equipment.
- The post-mining landscape increases the requirement for long-term monitoring and management.
- Unwanted ruins, buildings, foundations, footings, and waste management practices creating or leaving legacies.
- Sub-surface infrastructure remaining behind, limiting the intended post-closure land use including footings and foundations, power supply and water installations including pumps and pipelines.
- Equipment and other items used during the mining operation were left behind.
- Incomplete removal of re-usable infrastructure.
- Rubble from demolished infrastructure left behind.
- Post-mining topography is not compatible with the original landform.

5.2.4 Potential risks associated with viable and sustainable land.

- Uncontrolled expansion of mining footprint by not restricting the area disturbed by mining and the associated activities/infrastructure, resulting in loss of land with agricultural potential. Uncontrolled development of roads where existing farm roads are not used for mining operations and redundant internal roads are left behind.
- The post-mining landform is not compatible with the surrounding landscape and not capable of productive land use that achieves a land capability equal to that of pre-mining conditions
- Long term changes in land use are caused by not implementing prompt rehabilitation and maintenance of disturbances when possible as part of the annual rehabilitation plan.
- Unsuccessful rehabilitation can reduce the post-mining land use options. Rehabilitated areas could be too unstable to support post-mining land use objectives compatible with surrounding areas.
- Disturbance of ecology due to loss of habitat and cumulative impact of illegal collecting during long-term or life of mine can degrade areas and reduce the viability of adjacent areas.
- Inadequate control of alien invasive vegetation species can result in the establishment of populations or seed sources that threaten adjacent areas.

5.2.5 Potential Risks associated with a post-mining landform.

- Impact on surface water through modification of infiltration rates by increasing the extent of hardened surfaces.
- Inadequate topsoil restoration or creation of unnatural surface topography or slope form which could impact lower or adjacent slopes due to increased runoff velocity.
- Altered storm water runoff response due to large impervious areas and concentrated runoff in drainage systems. Concentrated storm runoff from infrastructure areas is erosive, causing sheet, rill and donga erosion features.

5.2.6 Potential Risks associated with the socio-economic environment.

- Disturbance of local communities in urban and rural areas caused by noise and dust emissions and increase in heavy vehicles along transport routes.
- An influx of people into the local communities looking for work, with an increase in demand for housing, schooling, and services. Such an influx of workers into a community often results in a change in social dynamics.

- Positive impacts include, for example, the creation of both formal and informal businesses to supply additional needs.
- Negative social impacts include, for example, an increase in substance abuse, HIV transmission and unwanted pregnancies.

- Staff losing their jobs at mine closure can have devastating effects on communities that are reliant on mine-based income.
- Job losses of secondary industries, businesses and contractors and contractual agreements with service providers surpassing mine closure date.
- Lack of compliance with the approved **EMPr** and a lack of auditing of the **EMPr**.
- Mining activities closure stalled due to non-compliance with relevant legislation (national, provincial, and local).
- Insufficient funds for complete rehabilitation.

5.2.7 Potential Risks associated with visual intrusion, noise, vibration, light pollution, and air emissions.

- Terrain morphology plays a critical role in defining the visual envelope of mining developments and can either reduce or enhance visual impact. Apart from visual intrusion, there is also the risk of a reduced sense of place. The visual intrusion impact of mining activity would be on nearby roads, homesteads, settlements, tourist accommodation, and along tourism routes or corridors.
- The visual disturbance would be caused by mining activities such as excavations. Buildings provide a colour contrast, as do disturbed areas against adjacent natural areas.
- Nuisance effects of air emissions due to a lack of implementation of dust suppression activities could impact on communities.
- Dust generated on haul roads reduces visibility, representing a safety hazard.
- Dust can retard vegetation growth and reduce the palatability of vegetation.
- The cumulative effect of a rise in the ambient noise levels or high noise levels in specific areas that exceed specified levels would impact on communities in close proximity.
- Noise disturbance and light pollution would result from night-time activities (if applicable) in areas that are in close proximity to communities.

5.2.8 Potential Risks associated with regard archaeological sites, cultural heritage sites or graves.

- Disturbance of identified surface, or unknown sub-surface archaeological sites, if mitigation and monitoring are not implemented as per mitigating measures in a Heritage Impact Assessment and Paleontological Impact Assessment.
- Progressive development can encroach upon or disturb archaeological sites, cultural heritage sites or graves.

5.3 Risk impact rating

Each impact or risk is assessed in terms of: nature (character status); extent (spatial scale); duration (time scale); probability (likelihood) of occurring; reversibility of the impact; the degree to which the impact may cause irreplaceable loss of resources; the significance (size or magnitude scale) prior to mitigation; the degree to which the impact can be mitigated; and, the significance (size or magnitude scale) after mitigation as per the criteria in Table 3 below.

Table 3: Impact Assessment Criteria

ASSESSMENT CRITERIA	
NATURE	
Positive	Beneficial to the receiving environment
Negative	Harmful to the receiving environment
Neutral	Neither beneficial nor harmful

EXTENT (GEOGRAPHICAL)	
Site	The impact will only affect the site
Local/ district	Will affect the local area or district
Province/region	Will affect the entire province or region
International and National	Will affect the entire country
CONSEQUENCE	
Loss/gain	The impact will result in loss or gain of resource
No loss/gain	The impact will result in no loss or no gain of resource
DURATION	
Construction period / Short term	Up to 3 years
Medium term	Up to 6 years after construction
Long term	More than 6 years after construction
PROBABILITY	
Definite	Impact will certainly occur (>75% probability of occurring)
Probable	Impact likely to occur (50 – 75% probability of occurring)
Possible	Impact may occur (25 – 50% probability of occurring)
Unlikely	Impact unlikely to occur (0 – 25% probability of occurring)
REVERSIBILITY	
Reversible	Impacts can be reversed though the implementation of mitigation measures
Irreversible	Impacts are permanent and can't be reversed by the implementation of mitigation measures
IRREPLACEABLE LOSS OF RESOURCES	
High	The impact is result in a complete loss of all resources
Medium	The impact will result in significant loss of resources
Low	The impact will result in marginal loss of resources
No Loss	The impact will not result in the loss of any resources
CUMULATIVE EFFECTS	
High	The impact would result in significant cumulative effects
Medium	The impact would result in moderate cumulative effects
Low	The impact would result in minor cumulative effects
SIGNIFICANCE RATINGS	
Very High	Major to permanent environmental change with extreme social importance.
High	Long term environmental change with great social importance.
Medium	Medium to long term environmental change with fair social importance.
Low	Short to medium term environmental change with little social importance.
Very low	Short-term environmental change with no social importance
None	No environmental change
Unknown	Due to lack of information
DEGREE TO WHICH IMPACT COULD BE AVOIDED/MANAGED/MITIGATED	
High	The impact could be significantly avoided/managed/mitigated.
Medium	The impact could be fairly avoided/managed/mitigated.
Low	The impact could be avoided/managed/mitigated to a limited degree.
Very Low	The impact could not be avoided/managed/mitigated; there are no mitigation measures that would prevent the impact from occurring.

5.4 Risk Mitigation and Closure objectives

Internationally, there seem to be three schools of thought:

- "What the affected community wants, the affected community gets" – that is, the key focus is on providing the end product requested by the affected communities, rather than focusing on the previous status quo of the receiving environment
- "Restoration of previous land use capability" – the original thought process in the South African context, because mining often occurs on land with high agricultural potential
- "No net loss of biodiversity" – the focal point in the ICMM/IUCN dialogue sponsored guidelines for mining and biodiversity, and of many mining corporate policies.

The thought process for the closure of this operation is based on the last two. In addition to the goals and objectives for final decommissioning and mine closure as documented in section 2 the vision for the post closure landform is to leave the site in as safe and self-sustaining a condition as possible and in a situation where no post-closure intervention is required. The vision is to ensure that the affected environment is maintained in a stable condition that will not be detrimental to the safety and health of humans and animals and that will not pollute the environment or lead to the degradation thereof and that the aesthetic value of the area will be reinstated.

For the vision to be realised the objectives and associated risk management strategies and mitigating measures described below needs to implemented, monitored and evaluated.

Risk management strategies were identified for the potentially significant risks, while data collection and analysis programmes were pursued to evaluate the uncertain risks.

The aim with risk mitigation actions is to over time manage high and medium risks to become low to very low, or at least medium and under control with management actions. Once achieved, a risk will continue to be monitored to confirm its insignificance rating of very low and controlled rating of medium to low as part of aftercare and maintenance as discussed in section 4.

The closure process involves a series of actions, executed over a number of years as indicated in the annual Closure Plans, with continual monitoring, review and remedial actions (if required). Identified and assessed risks feed into mitigation actions (or primary tasks) of which successful implementation result in achievement of the mine closure goals and objectives.

The three key mine closure objectives are elaborated on in more detail and in context of the relevant risks below (each of the objectives are supported by several key aims):

- Objective 1 - To create a safe and healthy post-mining environment
  - Safe topography
    - Safety of remaining drill holes
    - No potentially dangerous areas; secured if required
  - Limited residual environmental impact
    - No surface and/or groundwater contamination
    - Waste management practices not creating or leaving legacies
    - Develop a landscape that reduces the requirement for long term monitoring and management
- Objective 2 - To create a stable, free draining post mining landform, which is compatible with the surrounding landscape, and which is capable of a productive land use
  - Economically viable and sustainable land fit for grazing, as close as possible to its natural state.
    - Improve Land use with an increased production with regard to grazing.
    - Prepare area to promote natural re-establishment of vegetation that is self-sustaining, perpetual and provides a sustainable habitat for local fauna and successive flora species
- Objective 3 – To provide optimal post-mining social opportunities
  - Optimised benefits for the social environment
  - Minimal negative aesthetic impact
- The legal framework within which all the above lies entails:
  - Defining and meeting closure standards.
  - Complying with legislation.
  - Sufficient financial provision for mine closure activities.
  - Monitoring and plan for latent environmental impact.

The closure process involves a series of actions, with continual monitoring, review and remedial actions (if required). Identified and assessed risks feed into mitigation actions (or primary tasks) of which successful implementation result in achievement of the mine closure objectives and aims.

A narrative description is provided for each key objective in the following paragraphs. Risks associated with each closure objectives are discussed with their mitigation actions and believed impact rating at closure. In addition, the closure standard for each key aim is listed and quantified. Financial provision is

made in section 7 to deal with these mitigating measures in case of temporary closure or sudden closure during the normal operation of the project or at final planned closure.

5.4.1 Creating a Safe Post-mining environment with no residual environmental impact

a) Risks with regard to creating a Safe mining

- Slope stability of excavations - side walls not in a stable condition can be detrimental to the safety and health of humans and animals.
- Waste dumps slope stability - Collapsing slope(s)
- Failure of the fine residue dam wall (due to inside or outside forces)
- Potentially dangerous areas like deep excavations.
- Unsafe erosion gulley's
- Post mining topography not compatible with original landform.
- Uncontrolled access to a potentially unsafe post-mining area

Implementation of the following tasks to manage the risks associated with excavations and waste dump stability will ensure a safe post mining landscape without the requirement for long term monitoring and management. Regular inspections and audits will be used as management system to ensure compliance.

- The risk of post closure failure of the FRD will be zero given the extremely low rainfall in the area (outside forces) and the fact that FRD's will be developed within existing excavations (inside forces).
- A 14' Foot Rotary pan with a production capacity (ROM) of 40 Tons per Hour will be used and fine residue (slimes <0.6mm) will be produced at a rate of 12% of plant throughput or 6 tonnes/hr at full operation.
- A slimes dam will be created within any one of the existing excavations and the plant will be located above the FRD and as such the pumped slime delivery to the excavation will be gravity assisted.
- Slimes dams will be rehabilitated by covering the excavation with overburden and covering this layer with 150 mm of topsoil if available.
- There will be no risk for acid mine drainage or poor-quality leachates emanating from the mine or residue deposits. The residue material is inert and will be covered with overburden and topsoil and no leachate is expected due to the low rainfall.
- The slimes only consist of natural material and no flocculent will be used during processing and therefore there will be no adverse impacts on the environment and humans.
- With regard to excavations the land-use plan will be to prepare the area for natural re-vegetation by covering the disturbed areas with topsoil and implemented erosion control measures including waterways, drainage lines and storm water infrastructure if necessary.
- In terms of the stability the excavations will be backfilled shaped and covered with topsoil to promote re-vegetation and all side slopes of any remaining depressions will finished off to 1vertical:3horisontal, to ensure stability.
- The surface of the mined areas after backfilling will be lowered by an average of 0.5m. However, given the extremely low rainfall in the area, the local depressions will never provide catchment for enough water to form a wetland.
- Overburden handling will generally occur along the principles of a cut & fill strip mining operation where the removed overburden is used immediately in the backfill of previously mined cuts.
- If no mine cuts are available, the topsoil and overburden comprising approximately 80% of the volume will be placed on the banks of the excavations in windrows to be backfilled after gravel is removed. No new overburden, coarse tailings or oversize dumps will be created as part of this operation.
- Depending on the presence of mineralization within the virgin soil beneath the waste dumps bulk samples will be taken. The maximum footprint per box cut will be 1Ha including overburden and topsoil stockpiles giving an estimated excavation volume of ~15 000m^3 or 39 000 tonnes at a Sg of 2.6 per bulk sample.

- With an estimated mineralization of 20% present an estimated 3000 m³ diamondiferous gravel will be available for a Diamond Ore Characterisation (DOC) study and 12 000m³ overburden to be backfilled as part of concurrent rehabilitation.
- Development of excavations will entail the following: (Refer Figure 46):
  - Remove topsoil to either side of the eventual pit lateral extension. The upper 30cm will be treated as topsoil as it contains a seed bank at present.
    Say 1 000m² X.3 = 300m³
  - Then remove the overburden below the "topsoil" cover to a separate stockpile berm.
    Say 1 000m² X 1 = 1 000m³
  - The green silty sand below the old surface will then be stockpiled on a separate stockpile to expose the gravels.
  - The gravels will then be mapped, and a decision will be made on whether to continue with processing of gravel.
  - The removed gravel will be sent through an in-field screening plant and all material >75mm will be seen as oversize and will be retained at the excavation to be backfilled.
  - Gravel removed from the pits will be stockpiled near the plant area for analyses and treatment. The extent of the stockpiles will never exceed 200m³.
  - Back filling of coarse waste (6 to 12mm) and over-size material (12 - 75mm) part of spoils at the plant will be backfilled in the original excavations. Hauling will be conducted simultaneously with the hauling of the unprocessed gravel.
  - Whether the cuts yield positive results or not, the excavation must be backfilled - overburden first then the topsoil. It must be noted that the overburden will bulk by 26% when backfilled. As such, a mound will remain after backfilling of the pit. Such mound will eventually settle without interference. The amount of gravel removed to the plant will have a negligible impact on the eventual topography.
- The following are pertinent with regard to the excavation development:
  - The trench width will be determined by overburden depth. The deeper die overburden, the wider the trench will be at the surface.
  - The angle of repose and safety of the sidewalk in terms of slumping. The operator on site must determine these, as they are in situ safety considerations.

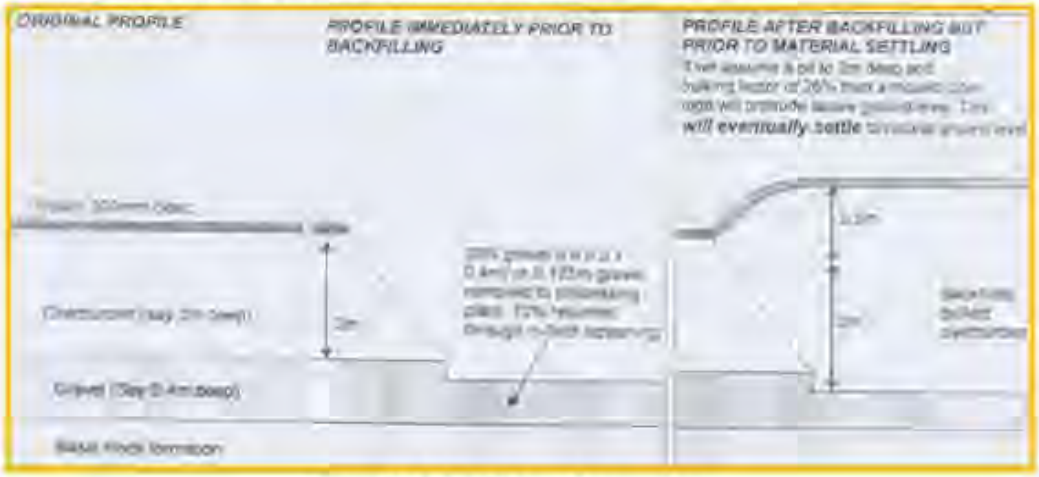


Figure 46: Rehabilitation of excavations

Another potential risk arising from the mining area after mine closure are changes in the quantity of surface water compared to pre-mining quantities that may negatively affect the area.

Implementation of the following tasks to manage the risks associated with Final Closure and demolition activities will ensure that waste management practices do not create and/or leave legacies and will limit

the residual impact of mine closure. Regular inspections and audits will be used as management system to ensure compliance.

- The post-mining topography at the excavations will be adjusted where possible to minimise the effect on water flow and increase potential for re-vegetation.
- Actions to mitigate the risk of erosion will be through implementation of practices such as leaving the profiling contours.
- Prevent water containing waste or any substance which causes or is likely to cause pollution of a water resource from entering any water resource, either by natural flow or by seepage, and must retain or collect such substance or water containing waste for use, re-use, evaporation or for purification and disposal in terms of the Water Act.
- Design, modify, locate, construct and maintain all water systems, including residue deposits in any area so as to prevent the pollution of any water resource through the operation or use thereof and to restrict the possibility of damage to the riparian or in-stream habitat through erosion or sedimentation, or the disturbance of vegetation, or the alteration of flow characteristics.
- Cause effective measures to be taken to minimise the flow of any surface water or floodwater into mine workings, opencast workings, other workings or subterranean caverns, through cracked or fissured formations, subsided ground, sinkholes, outcrop excavations, audits, entrances or any other openings.
- Design, modify, construct, maintain and use any dam or any residue deposit or stockpile used for the disposal or storage of mineral tailings, slimes, ash or other hydraulic transported substances so that the water or waste therein, or falling therein, will not result in the failure thereof or impair the stability thereof.
- Prevent the erosion or leaching of materials from any residue deposit or stockpile from any area and contain material or substances so eroded or leached in such area by providing suitable barrier dams, evaporation dams or any other effective measures to prevent this material or substance from entering and polluting any water resources.
- Ensure that water used in any process at a mine or activity is recycled as far as practicable, and any facility, sump, pumping installation, catchments dam or other impoundment used for recycling water, is of adequate design and capacity to prevent the spillage, seepage or release of water containing waste at any time.
- At all times keep any water system free from any matter or obstruction which may affect the efficiency thereof.
- Cause all domestic waste, including wash-water, which cannot be disposed of in a municipal sewage system, to be disposed of in terms of an authorisation under the Water Act

Having these actions in place should ensure that there is no negative effect on surface water flow and will assist in achieving the aim of limited residual impact.

b) Risks with regard to limiting residual environmental impact relates to:

- Post mining landscape that increases the requirement for long term monitoring and management.
- Unwanted ruins, buildings, foundations, footings and waste management practices creating or leaving legacies.
- Sub-surface infrastructure remaining behind, limiting the intended post closure land use including footings and foundations and power supply and water installations including pumps and pipelines except for potable water.
- Unwanted ruins, buildings, foundations, footings not demolished, or rubble left behind.
- Equipment and other items used during the mining operation left behind.
- Incomplete removal of re-usable infrastructure.
- Infrastructure to remain in terms of agreements with the landowner not maintained.
- Waste classes not kept in separate streams
- Surface and/or groundwater contamination
- Incomplete removal of waste
- Stockpiles and leftover product left behind

Implementation of the following tasks to manage the risks associated with Final Closure and demolition activities will ensure that waste management practices do not create and/or leave legacies and will limit the residual impact of mine closure. Regular inspections and audits will be used as management system to ensure compliance.

- Distinguished between farming and mining infrastructure and waste in consultation with landowner
- Redundant structures, buildings and civil foundations (down to one meter below surface for subsurface infrastructure) will be removed for use elsewhere or demolished and discarded.
- All redundant infrastructure and services need to be demolished including ruins, buildings, foundations, footings.
- Building rubble will be used as backfill in excavations.
- All steel structures and reinforcing including the processing plant will be discarded or sold as scrap.
- Remove all power and water supply installations not to be retained by landowner in terms of section 44 of the MPRDA.
- Removing underground infrastructure to one meter below surface.
- Any product or residue stockpiles left must be removed to the waste dump or used to backfill excavations.
- Implementing screening as part of the cleaning activities before materials are moved from the mine.
- The infrastructure area will be screened for petrochemical spills and cleaned and waste from the temporary storage facility will be removed, and the area cleaned.
- Excavations created by removing subsurface infrastructure needs to be filled, levelled and compacted.
- Separation of wastes into classes will ensure that waste is disposed of safely and according to the correct procedure.
- In order to ensure that waste classes are kept in separate streams, communication will be passed on and people will be trained on the different waste classes.
- All temporary waste storage areas need to be cleaned out and waste removed.
- Clean out content of oil traps and dispose of waste at registered and purpose designed landfill sites.
- Decontaminate oil and diesel contaminated soils and structures with biochemical agents prior to removal.
- Unwanted steel, sheet metal and equipment in the salvage yard will be sold or disposed of as scrap metal.
- The compacted salvage yard, lay down and movement areas will be screened for petrochemical spills and cleaned before it is ripped and levelled.
- During demolition activities there is the risk of the decontamination washing water ending up in water sources. By keeping contaminated and clean water separate and establishing controlled runoff washing bays, the flow and end destination of decontamination washing water will be controlled.
- The mine will not produce any residue except for the fines from the washing plant that could lead to water contaminated per se.
- All equipment and other items used during the mining operation needs to be removed from the site.
- Final walk through of complete mining lease area to ensure no mining related waste and of re-usable infrastructure remain on site.

At the time of final closure there will be no significant risks. Only one medium level risks will be present:

- Possible changes in the surface water quantities and flow patterns leading to erosion on the drill platform. When more information becomes available during the post-mining period, appropriate actions will be taken if proved necessary.

5.4.2 Create a stable, free draining post mining landform,

a) Risks relating to long term changes in land use:

- Post mining landform not compatible with the surrounding landscape and not capable of a productive land use that achieves a land capability equal to that of pre-mining conditions
- Uncontrolled expansion of mining footprint by not restricting the area disturbed by mining and the associated activities/infrastructure - loss of land with agricultural potential
- Unstable post mining landform, which is not compatible with the surrounding landscape, and which is capable of an unproductive land use that cannot achieve a land capability equal to that of pre mining conditions
- Long term changes in land use that cannot revert back to mainly small stock farming (grazing) caused by not implementing prompt rehabilitation and maintenance of disturbances according to the annual rehabilitation plan.
- Disturbance of ecology due to loss of habitat.
- Compacted areas due to loading and hauling limiting agricultural potential.
- Uncontrolled development of roads and new roads not kept to a minimum - existing farm roads not used for mining operations.
- Redundant internal roads left behind.
- Duel used roads still needed by the landowner and fences not maintained or repaired.

The activities and actions associated with achieving a stable, free draining post mining landform, which is compatible with the surrounding landscape, and which is capable of a productive land use that achieves a land capability equal to that of pre-mining conditions are listed below. It is important to note that for the mine to meet the key objective of economically viable and sustainable grazing, it is imperative that its other key objectives, viz. a safe post-mining area with limited residual impacts and optimal post-mining social opportunities are met. Should the attenuation measures for prevention of pollution as described in section 5.1 be implemented, the effect on soil and water will be insignificant.

- Any oil or fuel leaks caused during operations must be removed immediately with the saturated soil.
- There will be no risk for acid mine drainage or poor-quality leachates emanating from the mine or residue deposits.
- All roads not required by landowner must be ripped (30cm deep) and repairs to all fences and gates.
- Provision of efficient storm water control to prevent erosion of steep slopes and roadways and elsewhere are required.
- The access road is a dual use road, and the mine are only responsible for the maintenance of the road.
- Service roads needs to be maintained and handed over to the landowner in a good state of repair and all redundant fences needs to be removed and the boundary fence and gates repaired.
- Any stockpiles left must be removed or used to cover the FRD at the processing plant and/or other excavations
- Any remaining waste dumps not feasible for backfilling will be profiled with acceptable contours and erosion control measures and covered with available topsoil.
- Coarse natural material used for the construction of ramps must be removed and dumped into the excavations.
- Level the complete disturbed areas and restore the original profile to blend in with the natural topography.
- On completion of mining operations, the surface of the disturbed areas especially if compacted due to hauling and dumping operations, shall be scarified to a depth of at least 300mm and the previously stored topsoil will be returned to its original depth over the area.
- Unnecessary destruction of vegetation should be avoided by ensuring that traffic and personnel movement be restricted to demarcated areas. No traffic should be allowed on the rehabilitated areas.

At the time of final closure there will be no significant risks. There will however be medium level risks:

- The viability and sustainability of agriculture on the rehabilitated and profiled excavations will only be proven over time. Once results from a few consecutive surveys are available, the risk level can either be reduced, or actions required to reduce it further, or control the risk will become clear.
- Similar to the preceding risk, erodibility of the surface will need to be monitored over time before the risk level can be reduced with confidence, or mitigation actions will become clear.

5.4.3 Provide optimal post-mining social opportunities

a) Risks relating to optimised benefits for the social environment

- Staff losing their jobs
- Job losses of secondary industries, businesses and contractors
- Social responsibility projects in influence area not sustainable at mine closure
- Contractual agreements with service providers surpassing mine closure date
- Closure standards not accepted and/or are changing
- Mine closure being jeopardised by other land uses
- Poorly defined transition from mining to farming activities within different legislation
- No positive and transparent relationships with stakeholders and not maintaining communication channels – not providing stakeholders including government authorities with relevant information as per legislative requirements.
- Not undertaking environmental management according to approved EMPr and plans and no auditing of the environmental management system.
- Mine closure stalled due to non-compliance with South African legislation (national, provincial and local)
- Insufficient funds for complete rehabilitation

The impact of mine closure is limited and is not expected to alter the socio-economic circumstances of the study area significantly however those losing employment will experience significant impacts.

- Contract durations with service providers will be limited to address the risk of contractual agreements with service providers surpassing the mine closure date.
- Maintain positive and transparent relationships with stakeholders and maintaining communication channels.
- Provide stakeholders including government authorities with relevant information as per legislative requirements.
- Undertaking environmental management in accordance with the approved EMPr and Closure Plan.
- Minimise noise disturbance: limiting earth moving to daytime.
- Management of air emissions to minimise nuisance effects or health risk; implementation and maintenance of dust monitoring programs accompanied by dust suppression activities by spraying water and/or dust-allaying agents.
- Prevent long term changes in land use: revert back to grazing land where possible.

b) Risks relating to Minimal negative aesthetic impact

- Visual disturbance from the public road views - infrastructure remaining blocking the view
- Incomplete removal of waste - waste classes not kept in separate streams
- Nuisance effects of air emissions (dust) no implementation and maintenance of dust monitoring programs accompanied by dust suppression activities if required.
- Noise disturbance and light pollution as a result of night activities.
- Disturbance of archaeological sites do not implement mitigating measures according to the archaeological assessment.

Minimal negative aesthetic impact will be achieved by the implementation of the tasks required to limit residual environmental impact listed above including the following:

- Identify infrastructure and services to remain after closure.
- The residential and logistics area will be screened for petrochemical spills and cleaned.
- Final maintenance of dual use roads to remain after closure.
- All remaining service roads needs to be graded with provision of efficient storm water control to prevent erosion of steep slopes and roadways and elsewhere are required.
- During decommissioning and rehabilitation levels of dust generation need to be monitored and if dust levels rise above acceptable limits dust should be controlled in the interest of improved worker health and safety. In this instance periodic wetting of the manoeuvring areas can be considered (No used oil or diesel is to be used for dust suppression).
- Involve all employees/contractors in the speed reduction campaign as road surface condition is more related to speed than to frequency of use.
- Minimise noise and light disturbance: limiting mining and decommissioning actions to daytime.
- Minimise visual disturbance: implementation of mitigating measures from the public road views.
- Waste material of any description, including receptacles, scrap, rubble and tyres, must be removed entirely from the mining area and disposed of at a recognised landfill facility. It will not be buried or burned on the site.
- No significant archaeological sites and mitigating measures were identified in the archaeological assessment completed for the mining area.

At the time of final closure there will be no significant risks.

5.4.4 Risks, risk levels and mitigating actions

In addition to the goals and objectives for final decommissioning and mine closure the vision for the post closure landform is to leave the site in as safe and self-sustaining a condition as possible and in a situation where no post-closure intervention is required. The vision is to ensure that the affected environment is maintained in a stable condition that will not be detrimental to the safety and health of humans and animals and that will not pollute the environment or lead to the degradation thereof and that the aesthetic value of the area will be reinstated.

For the vision to be realised the objectives and associated risk management strategies and mitigating measures for the operational phase described in Table 4 below needs to implemented, monitored and evaluated.

The aim with risk mitigation actions is to over time manage significant and medium risks to become insignificant, or at least medium and under control with management actions. Once achieved, a risk will continue to be monitored to confirm its insignificance rating as part of aftercare and maintenance.

The closure process involves a series of actions, executed over a number of years as indicated in the annual Closure Plans, with continual monitoring, review and remedial actions (if required). Identified and assessed risks feed into mitigation actions (or primary tasks) of which successful implementation result in achievement of the mine closure goals and objectives.

Financial provision is made in section 6 to deal with these mitigating measures in case of temporary closure or sudden closure during the normal operation of the project or at final planned closure.

The identified risks and their levels are listed together with their associated mitigating actions for the operational phase in Table 4 below

Table 4: Risks, risk levels and mitigating actions: Operational Phase

IMPACTS AND ASPECTS	RISK LEVEL AFTER MITIGATION: PREFERRED AND ONLY ALTERNATIVE	MITIGATING ACTIONS
1. CHANGE IN TOPOGRAPHY: The change in topography from mining activities would be slight depressions created in the landscape. These depressions would be minimal as only 1%-5% is taken for final recovery. The tailings are returned to the excavated areas for backfilling.	Low Risk	• Excavations will be backfilled immediately after processing for security and safety reasons before the project is moved to the next resource target. In case of the sudden closure of the project, there will only be one open excavation to be dealt with as part of final decommissioning and rehabilitation. • At final closure, the floor of the excavations needs to be levelled and the sides sloped to create an even depression.
2. SOIL EROSION & SOIL COMPACTION: The potential for soil erosion by wind and stormwater run-off; soil compaction from repeated use of access tracks.	Low / Insignificant Risk	• After clearing, the affected area shall be stabilised to prevent any erosion or sediment runoff. Stabilised areas shall be demarcated accordingly. • Incremental clearing of vegetation should take place to avoid unnecessarily exposed surfaces.

		• Reasonable measures must be undertaken to ensure that any exposed areas are adequately protected against wind and stormwater run-off. • Reduce drop height of material to a minimum. • Temporarily halt material handling in windy conditions. • A speed limit of 30km/hour will be displayed and enforced through a fining system. All vehicle drivers using the access road and entering the site will be informed of the speed limit. • Compacted areas that are not required for access shall be scarified after use during decommissioning and rehabilitation. • The basic rehabilitation methodology will therefore strive to replicate the pre-mining topography, wherever possible, or at least not to increase overall slope gradients without emplacement of adequately designed erosion control or runoff diversion structures. • Provision must also be made for efficient stormwater control to prevent erosion of roadways. • Soil erosion on haul roads is to be regularly monitored and repaired. • Topsoil shall be removed separately and stockpiled separately from other soil base layers. • The stockpile areas for topsoil are temporary as they will be re-used on a cut and fill basis. • Stockpiles should ideally be located to create the least visual impact and must be maintained to avoid erosion of the material. • Topsoil storage areas must be convex and should not exceed 2m in height. • Topsoil must be treated with care, must not be buried or in any other way be rendered unsuitable for further use (e.g., by mixing with spoil) and precautions must be taken to prevent unnecessary handling and compaction. • In particular, topsoil must not be subject to compaction greater than 1 500 kg/m² and must not be pushed by a bulldozer for more than 50 metres. Trucks may not be driven over the stockpiles. • Tailings may only be located on the open excavations to reduce impacts on undisturbed areas.
3. WATER RESOURCES (QUALITY AND QUANTITY): Water is obtained from boreholes present in the mining area and stored in a 45 000-litre reservoir. Supply lines from the reservoir to the logistical facilities and plant needs to be upgraded and underground pipelines demarcated. This storage will also provide an emergency supply for the fire hydrants. The Buffels River and tributary are located on the southern border of the farm.	Low Risk	<u>Implement and follow water-saving procedures and methodologies.</u> • Follow an 8 hour per day pumping schedule. • Place oil traps under stationary machinery, only re-fuel machines at fuelling station, construct structures to trap fuel spills at fuelling station, immediately clean oil and fuel spills and dispose of contaminated material (soil, etc.) at licensed sites only. • Take care that temporary onsite sanitation facilities are well maintained and serviced regularly. • Draw-up and strictly enforce procedures for the storage, handling and transport of different hazardous materials. • Ensure vehicles and equipment are in good working order and drivers and operators are properly trained. • Ensure that good housekeeping rules are applied.

		• Minimise storage of hazardous substances on-site during construction. • Service and refuel construction vehicles at a fit-for-purpose facility to minimise pollution risks. • Waste materials generated on-site must be stored in suitable lidded containers and removed off-site to a suitable disposal facility. • The waste separation must be undertaken if practical for recycling. • Provide all workers with environmental awareness training and comply with the requirements of the EMPr. • Provide mobile ablution facilities • Drinking water to be brought on-site as per existing practices. Wastewater (i.e., including process water and grey water) - A biozone system will be used to treat effluent (containerised). - By keeping contaminated and clean water separate and establishing controlled runoff washing bays, the flow and end destination of decontamination washing water will be controlled. - Although erosion and runoff are natural processes it should be managed by maintaining topsoil in any areas, not in use and maintaining maximum existing vegetation coverage. - Slow stormwater runoff with contoured, low-gradient drains and channels. - Stormwater diversion and erosion control contour berm separate clean and contaminated water systems around the excavations and infrastructure areas.
4. LIMITED LOSS OF NATURAL VEGETATION AND ECOLOGICAL FUNCTIONING: The proposed mining area footprint will result in an impact on localised ecological functioning, although limited as bulk sampling, has already occurred in some places; the tailings storage facility will be situated in historically excavated areas, where possible; access and haul roads exist; and the site camp area will also be on a disturbed area. Transport of materials will be along existing access tracks resulting in little impact on ecological functioning at a local level during the operation phase. The machinery and trucks will continue to disturb local fauna, already accustomed to the existing mining activities. The site is mostly classified as a Critical Biodiversity Area (CBA1 and CBA2) and a small	Medium-Low / Insignificant Risk	• Demarcate the excavation and resource target areas, and topsoil stockpiles using shade cloth to contain the area of disturbance. • Leave a 50cm gap between the bottom of the shade cloth and the ground to allow for the movement of small fauna. • Demarcate the sections of existing tracks that may be used to access each resource area, including the area for turning circles of vehicles. • Conduct a "search and rescue" operation to identify any plants of conservation concern before clearing each resource area, and for the increased area required for inferred resources. • No indigenous plants outside of the demarcated work areas may be damaged or removed. • Remove alien invasive vegetation if required and ensure ongoing alien vegetation clearing in the resource target areas. • The noise and vibration caused by the earthmoving equipment will disturb mobile fauna that should move away when activities commence. Should any animals be encountered, these should be relocated by a suitably trained nature conservation officer. • Demarcate areas for the resource target areas and ensure that all other adjacent areas are regarded as no-go areas. • A 10m buffer must be left between the river/tributary and target areas as well as inferred resource area, where no excavation may take place.

section is classified as an Ecological Support Area (ESA). A section on the south eastern area of the farm is classified as a River FEPA. The entire site has minimal vegetation cover as it has been disturbed by previous prospecting and mining activities.		• The Final Rehabilitation, Decommission & Mine Closure Plan and Annual Rehabilitation Plan must be implemented.
5. POTENTIAL FOR SOIL CONTAMINATION, AND WASTE MANAGEMENT DURING OPERATIONAL PHASE: Tailings are to be collected in the tailings storage facility located in the old excavation where possible; overburden; industrial waste (hazardous wastes, oil & grease); and domestic waste	Low / Insignificant Risk	○ **Tailings collected within the tailings storage facility and dumped into open excavations as part of ongoing rehabilitation.** - Water used as part of processing will be collected in the tailings storage facility from where the water will be re-used if possible. • **Overburden, cover, and/or "soft" material including topsoil** - Remove and stockpile 300mm topsoil in berms or heaps less than 1,5m high and turn soil or re-use every six months. - Remove and stockpile topsoil building platforms and stockpile areas before construction for use to restore disturbed areas. To ensure long-term stability, the restored soil cover should attempt to mimic the pre-mining distribution of soil texture and thickness. - Contaminated soil must be treated by first removing the source of contamination - removing the source of contamination should allow the system to recover without further clean-up required. - Petrochemical spillages are to be collected in a drip tray and drum to store excavated spill affected soil for disposal at a registered facility or onsite treatment. - The most promising techniques for on-site treatment involve bioremediation. Bioremediation involves the use of microorganisms to destroy hazardous contaminants. • **Other non-specification waste** - Any product stockpiles left, or oversize boulders must be removed and used to backfill excavations. - Waste or rock material used as refill or landscaping, crushed for other applications, or otherwise dealt with responsibly. • **Industrial waste (i.e., including hazardous wastes and oils and greases)** - Separation of wastes into classes will ensure that waste is disposed of safely and according to the correct procedure. To ensure that waste classes are kept in separate streams, people will be trained on the different waste classes. - Unwanted steel, sheet metal and equipment need to be stored in a demarcated salvage yard. - Recycling and reusing materials may reduce garbage haul fees or generate income through the sale of scrap metal and old equipment. - All steel structures and reinforcing will be discarded or sold as scrap. - All equipment and other items used during the mining operation need to be removed from the site. - Used oils/hydrocarbons fuels/liquids are to be collected in sealed containers (stored on concrete slabs) and removed from the site for recycling by a reputable company.

		- All waste in the temporary storage area for used lubrication products and other hazardous chemicals will be disposed of at a collection point from where it will be collected by a waste recycling company. - Mobile generators will supply electricity to the machinery. Generator bays will be constructed with the necessary pollution control measures (drip trays). - Clean out the content of oil traps and dispose of waste at registered and purpose-designed landfill sites. - Hydrocarbon contaminated sludge (collected in oil traps) - Removed from the oil traps and removed from the site for recycling (if possible) or disposal at a suitably permitted facility. - All temporary waste storage areas need to be cleaned out and waste removed. - Tyres to be return to the supplier or a company that uses old tyres for making doormats, shoes, swings, etc. - Batteries to be return to the supplier or dispose of at a permitted hazardous waste facility. - Fluorescent tubes to be collected in sealed containers (stored on concrete slabs) and removed from the site for disposal at a permitted hazardous waste facility. - Chemical containers to be returned to the supplier or disposed of at a legal, permitted facility that is capable of disposing of the waste. (DO NOT sell chemical containers to workers or communities). - Laboratory waste (chemicals) - Returned to the supplier or disposed of at a permitted facility that is capable of disposing of the waste. - Industrial chemicals (laboratory waste) - Returned to the supplier or disposed of at a permitted facility that is capable of disposing of the waste. These liquid wastes cannot be disposed of in the waste dumps. • **Domestic waste (i.e., waste that is generated from the accommodation and offices)** - Domestic waste - Separated at source into recyclable products. These must then be removed and recycled by recognised contractors. (Note that the mine is responsible for the waste from cradle to grave). - Disposal at a registered and officially permitted commercial or municipal landfill site is the most cost-effective option for materials that cannot be recycled. - Domestic waste generated by workers needs to be sorted and all biodegradable waste must be stored in separate drums provided for. • This biodegradable waste will be dumped in a landfill provided for onsite.
6. VISUAL INTRUSION: Caused by the machinery, topsoil and overburden stockpiles, cleared areas, and movement of trucks on site.	Low / Insignificant Risk	• The site shall be kept neat and tidy at all times. Equipment must be kept in designated areas and storing/stockpiling shall be kept orderly. • Mitigation of the visual impact by the screening of mining excavations with sand colour shade cloth.
7. EMISSIONS (DUST, VEHICLES & NOISE): Noise and dust will be created by the mining and processing activities; from the mining	Low / Insignificant Risk	• Health and safety equipment is required for workers. • The wetting of the roads helps reduce dust generation during transporting of processing materials.

equipment (e.g., front-end loaders) and hauling vehicles that also emit Greenhouse Gases.		• No amplified music should be allowed on site. • Existing tracks will be used as haul roads and will only be upgraded to facilitate haul trucks by applying dust suppression and/or hardening compounds such as Macadamite. • On public roads, the vehicles shall adhere to municipal and provincial traffic regulations including speed limits. • Vehicles used on-site for construction-related activities shall be maintained and in good working condition to reduce emissions. • Engines shall be turned off when the vehicle is temporarily parked or stationary for long periods. • Incremental clearing of ground cover should take place to minimise exposed surfaces.
8. ARCHAEOLOGICAL RESOURCES AND GRAVES IMPACTS Direct impacts to archaeological resources might occur during all phases of development (e.g., vehicles could drive over archaeological sites).	Low Risk	**The following recommendations are made:** No further surveys are required within the study areas considered here. However, if any work is proposed outside of the surveyed areas, then these areas must be covered in the field to determine whether any archaeological sites are present. In addition to invasive activities like prospecting and mining, this includes uses such as stockpiling of excavated materials or construction of supporting infrastructure. Should any activity need to occur within the areas demarcated in Figure 50 (of the HIA) then an archaeologist should be commissioned to effect mitigation measures. These measures would entail conducting excavations to record and sample the archaeological materials. It is strongly recommended that the historical copper mining complex and grave site be avoided completely but mitigated can be carried if absolutely necessary. • The fossil find procedures must be incorporated into the EMPr and applied whenever fossil finds are made. This includes the reporting of all finds to a palaeontologist. • The identified significant archaeological sites and their buffers must be included on mine maps and if any are to be disturbed for any reason then archaeological mitigation must be affected (under a permit issued by SAHRA) and approved by SAHRA prior to commencement of mining work. • The historic copper mining complex and grave site should be avoided altogether (see Grade IIIA sites on Figure 50 of the HIA); and • If any archaeological material or human burials are uncovered during the course of development, then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.
9. PALEONTOLOGICAL RESOURCES Destruction of or damage to fossil bones or resources by sampling and mining.	Very Low Risk	Mitigation measures to reduce residual risk or enhance opportunities: • Identify and appoint stand-by palaeontologist should paleontological finds be uncovered. • Mine personnel to be alert for rare fossil bones and follow "Fossil Finds Procedure" (Appendix 2

		of the PIA). • On discovery of in situ fossil bones during sampling/mining, cease excavation and protect fossils from further damage. • On discovery of potential fossils in ex-situ sandstones, remove to a safekeeping site. • On discovery of fossils in rotary pan concentrate, collect to labelled bag. • Contact appointed palaeontologist providing information and images. • Palaeontologist will assess information and establish suitable response, such as the importance of the find and recommendations for preservation, collection and record keeping.
10. SOCIO-ECONOMIC: Creation of employment & job security during operational phase with local and regional economic spin-offs	Medium / Low Risk	• Employment of local previously disadvantaged labour wherever possible, with provision of training (upskilling)

65

6 Estimated cost for requirements to fully decommission the site

According to NEMA Financial Provisioning Regulations, 2015 as amended an applicant must determine the financial provision through a detailed itemisation of all activities and costs, calculated based on the actual costs of implementation of the measures required for— (a) annual rehabilitation, as reflected in an annual rehabilitation plan; (b) final rehabilitation, decommissioning and closure of the prospecting, exploration, mining or production operations at the end of the life of operations, as reflected in a Final Rehabilitation, Decommission 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.

In terms of regulation 11(1) the holder of a right or permit must ensure that a review is undertaken of the requirements for (a) annual rehabilitation, as reflected in an annual rehabilitation plan; (b) final rehabilitation, decommissioning and closure of the prospecting, exploration, mining or production operations at the end of the life of operations as reflected in a Final Rehabilitation, Decommission 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.

6.1 Assessment of financial provision

The assessment of the financial provision requirements for annual rehabilitation in terms reg. 6(a) is provided for as part of the annual rehabilitation plan that form part of the annual environmental audit of the implementation of the environmental authorization and Closure Plan in terms of the NEMA EIA regulations (2014).

No remediation of latent or residual environmental impacts which may become known in the future were identified at this stage. Financial provision in terms of reg. 6(c) are covered by the requirements for the actual costs of implementation of the measures required for final rehabilitation, decommissioning and closure of the mining operations at the end of the life of operations as reflected in this Final Rehabilitation, Decommission and Mine Closure Plan in terms of reg. 6(b).

6.2 Quantified Closure elements

The following risk-based criteria and assumptions were used to calculate the final rehabilitation, decommissioning and closure cost of the active mining area:

- FRD's will be created within any one of the existing excavations.
- No new overburden, coarse tailings or oversize dumps will be created as part of this operation.
- The general approach adopted for excavations is to reinstate the original profile of the landscape and ensuring the hydrological integrity of the area. Topography to follow the original landform shape.
- The excavations will be filled in with overburden, the top 150 mm being topsoil
- Where topsoil is not available, the cost for in-situ remediation will be the same as the estimate for top soiling
- The post-mining topography at the excavations will be adjusted where possible to minimise the effect on water flow and increase potential for re-vegetation.
- Ensure that water used in any process at a mine or activity is recycled as far as practicable, and any facility, sump, pumping installation, catchments dam or other impoundment used for recycling water, is of adequate design and capacity to prevent the spillage, seepage or release of water containing waste at any time.

The following risk-based criteria and assumptions were used to calculate the final rehabilitation, decommissioning and closure cost of the infrastructure and processing area:

- Removal of all structures and infrastructure not developed as part of farm improvement
- Remove all assets, all vehicles, plant and workshop equipment will be removed for salvage or resale

- All fixed assets that can be profitably removed will be removed for salvage or resale
- Any item that has no salvage value to the mine, but could be of value to individuals, will be sold (zero salvage assumed in cost estimation) and the remaining treated as waste and removed from site
- All structures will be demolished and terracing, and foundations removed to the lesser of 500 mm below the original ground level
- Inert waste, which is more than 500 mm underground, such as pipes, will be left in place
- A hazardous disposal site will not be constructed, and all hazardous waste will be removed from site and transported to the nearest licensed facility as part of housekeeping
- All services related to the operation, water supply lines and storage on site will have to be demolished
- All compacted areas due to hauling and stockpiling must be ripped to 300 mm
- The compacted salvage yard, lay down and movement areas will be screened for petrochemical spills and cleaned before it is ripped and levelled.
- All disturbed and exposed surfaces will be prepared to facilitate natural revegetation
- Existing tracks will be used, and new tracks must be restricted to the absolute minimum.
- Disturbed land will be used for development of processing areas and all FRD's to be developed within existing excavations
- Rotary plant to be moved according to the blocks to be explored and infield screening to be done at excavations to reduce the volume of material to be hauled to the processing plant
- No new tailings or waste rock dumps will be created above surface as part of this operation
- Return of land to its pre-mining land capability where possible
- Haul roads will be developed in relation to the mining sites by following the shortest route from existing tracks.
- The tailings and waste rock dumps at the processing plant will not exceed the planned area footprint (200m^3) and must be hauled back to excavations on a regular basis

6.3 Calculation of Closure cost

For each closure element, various possible combinations of required rehabilitation work were identified, and costs were calculated for each of these, based on quotations obtained from independent third-party suppliers for earthmoving equipment rental and various other consumables.

Earth Moving Equipment	Rental Rate	Fuel Cost	Total Cost
Bulldozer Cat D9R	R1 151.00	R429.00	R1 580.00
Front End Loader - 30 Ton	R687.00	R429.00	R1 116.00
Excavator - 45 Ton	R687.00	R429.00	R1 116.00
Excavator - 30 Ton	R392.00	R286.00	R678.00
Excavator - 20 Ton	R322.00	R234.00	R556.00
Cat 14 H Grader	R453.00	R234.00	R687.00
Articulated Dump Truck - 30 Ton	R392.00	R182.00	R574.00
Tipper Truck 6m^3	R255.00	R156.00	R411.00
Tipper Truck 10m^3	R309.00	R182.00	R491.00
Manual Labour /hour			R25.00

Cost Factor	Infrastructure Closure Element	Cost calculation			
1	**Demolish and remove Buildings/Infrastructure including subsurface structures and bunded fuel storage - Salvage useable material, break structure and dispose in waste dump**	**Cost/h**	**Service hours**	**Labour**	**Total**
	Tipper Truck 10m³ transport building rubble to excavations	R491.00	4.00	0	R1 964.00
	Excavator - 20 Ton Demolish concrete and loading	R556.00	8.00	0	R4 448.00
	Cleanup	R25.00	8.00	4	R800.00
	Total/Ha				**R7 212.00**
2	**Remove waste from temporary storage and scrap from salvage yard**	**Cost/h**	**Service hours**	**Labour**	**Total**
	Tipper Truck 10m³ transport to waste disposal site	R491.00	8.00	"	R3 928.00
	Treat petrochemical waste from sumps in oil seperator - fuel storage, service apron & washbay	R1 200.00	6.00	"	R7 200.00
	Cleanup	R25.00	8.00	2	R400.00
	Total/Ha				**R11 528.00**
3	**Final cleanup - remove all mining related waste**	**Cost/h**	**Service hours**	**Labour**	**Total**
	Tipper Truck 10m³ transport to waste disposal site	R491.00	8.00	"	R3 928.00
	Areas to be screened for petrochemical spills and cleaned	R25.00	8.00	4	R800.00
	Cleanup	R25.00	8.00	2	R400.00
	Total/Ha				**R5 128.00**
4	**Areas to be screened for petrochemical spills and cleaned before ripped/levelled - Remove 20cm of cover and dispose**	**m²/m³ Soil**	**R/m³**	**R/m²**	**R/Ha**
	Loading and transport of polluted soil	5	R9.79	R1.96	R19 575.96
	Total/Ha				**R19 575.96**

Cost Factor	Mining Closure Element	Cost calculation				
5	**Back filling by means of Loading and hauling - distances 80-500m**	**Load Vol m³**	**Loads/h**	**m³/h**	**R/h**	**R/m³**
	Excavator cycle	1.2	120	144	R678.00	R4.71
	ADT cycle	17	7	113	R1 148.00	R10.16
	Total cost/m³					**R14.87**
6	**Back filling by means of dozing - distances 20 - 80m**	**Load Vol m³**	**Loads/h**	**m³/h**	**R/h**	**R/m³**
	Backfilling, profiling and shaping - Cat D9 R Bulldozer	"	"	500	R1 580.00	R3.16
	Total cost/m³			**R500.00**		**R3.16**
7	**Sloping Sides remaining excavations and overburden dumps 18°**	**m²/h**	**m²/h**	**R/h**	**R/m²**	**R/Ha**
	Excavator - 20 Ton	"	250	R687.00	R2.75	R27 480.00
	Total cost/Ha					**R27 480.00**
8	**Level and reinstate topography ripp compacted areas**	**m²/h**	**m²/h**	**R/h**	**R/m²**	**R/Ha**
	Cat D9 R Bulldozer	"	5000	R1 580.00	R0.32	R3 160.00
	Total cost/Ha					**R3 160.00**
9	**Final cleanup - remove all mining related waste**	**m³/h**	**m³/m³**	**R/m³**	**R/m²**	**R/Ha**
	Tipper Truck 10m³ transport to waste disposal site	10	1000	49.10	0.0491	R491.00
	Areas to be screened for petrochemical spills and cleaned		5	R9.79	R1.96	R19 575.96
	Total cost/Ha					**R20 066.96**
10	**Aftercare and maintenance for 2 years**	**h/Ha**			**R/h**	**R/Ha**
	Annual clean-up	1	"	"	R25.00	R25.00
	Erosion control & invader plant clearing	2	"	"	R25.00	R50.00
	Total cost/Ha					**R75.00**

68

6.4 Total estimated cost for environmental liability

Infrastructure and Processing Areas
Risk based criteria and assumptions with regard to rehabilitation

- Removal of all structures and infrastructure not developed as part of farm improvement
- Remove all assets, all vehicles, plant and workshop equipment will be removed for salvage or resale
- All fixed assets that can be profitably removed will be removed for salvage or resale
- Any item that has no salvage value to the mine, but could be of value to individuals, will be sold (zero salvage assumed in cost estimation) and the remaining treated as waste and removed from site
- All structures will be demolished and terracing and foundations removed to the lesser of 500 mm below the original ground level
- Inert waste, which is more than 500 mm underground, such as pipes, will be left in place
- A hazardous disposal site will not be constructed and all hazardous waste will be removed from site and transported to the nearest licensed facility as part of housekeeping
- All services related to the operation, water supply lines and storage on site will have to be demolished
- All compacted areas due to hauling and stockpiling must be ripped to 300 mm
- The compacted salvage yard, lay down and movement areas will be screened for petrochemical spills and cleaned before it is ripped and levelled
- All disturbed and exposed surfaces will be prepared to facilitate natural revegetation
- Existing tracks will be used and new tracks must be restricted to the absolute minimum
- Disturbed land will be used for development of processing areas and all FRD's to be developed within existing excavations
- Rotary plant to be moved according to the blocks to be explored and infield screening to be done at excavations to reduce the volume of material to be hauled to the processing plant
- No new tailings or waste rock dumps will be created above surface as part of this operation
- Return of land to its pre-mining land capability where possible
- Haul roads will be developed in relation to the bulk sample sites by following the shortest route from existing tracks
- The tailings and waste rock dumps at the processing plant will not exceed the planned area footprint (200m²) and must be hauled back to excavations on a regular basis

Closure Element Mitigating measures	Unit	No Units	Unit Cost	Total Cost Element	Final Closure	Annual Rehab Plan
Block 1 No infrastructure						
Block 2 (IS 1)						
Living quarters - demarcate, upgrade & maintain as part of farm improvement	/year	5	R2 000.00	R10 000.00	R2 000.00	R8 000.00
Generator Bay - upgrade & maintain as part of farm improvement	/year	5	R500.00	R2 500.00	R500.00	R2 000.00
Salvage Yard - demolish remove scrap and waste (CF 2)	Ha	0.4	R11 528.00	R4 611.20	R0.00	R4 611.20
Final clean-up (CF 3)	Ha	2	R5 128.00	R10 256.00	R10 256.00	R0.00
Aftercare and Maintenance (CF 10)	Ha	2	R75.00	R150.00	R150.00	R0.00
			Sub-Total	**R27 517.20**	**R12 906.00**	**R14 611.20**
Block 3 No infrastructure						
Block 4 (IS 2)						
Cement reservoir - maintain as part of farm improvement	/year	5	R500.00	R2 500.00	R500.00	R2 000.00
Final clean-up (CF 3)	Ha	1	R5 128.00	R5 128.00	R5 128.00	R0.00
Aftercare and Maintenance (CF 10)	Ha	2	R75.00	R150.00	R150.00	R0.00
			Sub-Total	**R7 778.00**	**R5 778.00**	**R2 000.00**
Block 5 No infrastructure						
Block 6 No infrastructure						
Block 7 (IS 6)						
Living quarters - demarcate, upgrade & maintain as part of farm improvement	1/year	5	R5 000.00	R25 000.00	R5 000.00	R20 000.00
Bulk Fuel storage - upgrade & maintain as part of farm improvement	1/year	5	R9 000.00	R45 000.00	R9 000.00	R36 000.00
Generator Bay - upgrade & maintain as part of farm improvement	1/year	5	R5 000.00	R25 000.00	R5 000.00	R20 000.00
Cleanout sumps - service apron	2/year	10	R2 194.72	R21 947.20	R4 389.44	R17 557.76
Final clean-up (CF 3)	Ha	3	R5 128.00	R15 384.00	R15 384.00	R0.00
Aftercare and Maintenance (CF 10)	Ha	3	R75.00	R225.00	R225.00	R0.00
			Sub-Total	**R132 556.20**	**R38 998.44**	**R93 557.76**
Block 8 (IS 4 & 5)						
Ruins & Magazine - remove building rubble and backfill in existing excavations (CF 1)	Ha	2	R7 212.00	R14 424.00	R0.00	R14 424.00
Ruins & Magazine - rip compacted areas (CF 8)	Ha	2	R3 160.00	R6 320.00	R0.00	R6 320.00
Workshop 2, Water storage & Final Recovery - demarcate, upgrade & maintain as part of farm improvement	1/year	5	R10 000.00	R50 000.00	R10 000.00	R40 000.00
Workshop 1 - Remove and demolish all structures	*	1	R25 000.00	R25 000.00	R25 000.00	R0.00
Waste management - Develop, upgrade, demarcate, signage and maintenance	1/year	5	R12 000.00	R60 000.00	R12 000.00	R48 000.00
Cleanout sumps - service/wash bay, waste storage	2/year	10	R2 194.72	R21 947.20	R4 389.44	R17 557.76
Remove waste from temporary storage and scrap from salvage yard	2/year	10	R1 520.70	R15 207.00	R3 041.40	R12 165.60
Final clean-up (CF 3)	Ha	3	R5 128.00	R15 384.00	R15 384.00	R0.00
Aftercare and Maintenance (CF 10)	Ha	3	R75.00	R225.00	R225.00	R0.00
			Sub-Total	**R208 507.20**	**R70 039.84**	**R138 467.36**
			Total liability infrastructure		**R127 722.28**	**R248 636.32**

Mining Area

Risk based criteria and assumptions with regard to rehabilitation

- PRD's will be created within any one of the existing excavations
- No new overburden, coarse tailings or oversize dumps will be created as part of this operation
- The general approach adopted for excavations is to reinstating the original profile of the landscape and ensuring the hydrological integrity of the area
- Topography to follow the original landform shape, or be modified to provide for a solar farm the proposed post mining landuse
- The excavations will be filled in with overburden, the top 150 mm being topsoil
- Where topsoil is not available, the cost for in-situ remediation will be the same as the estimate for top soiling
- The post-mining topography at the excavations will be adjusted where possible to minimise the effect on water flow and increase potential for re-vegetation
- Ensure that water used in any process at a mine or activity is recycled as far as practicable, and any facility, sump, pumping installation, catchments dam or other impoundment used for recycling water, is of adequate design and capacity to prevent the spillage, seepage or release of water containing waste at any time

Closure Element Mitigating measures	Unit	No Units	Unit Cost	Cost per Element	Final Closure	Annual Rehab Plan
Block 1 ±125HA 0.4% transformed, 6.5% surface disturbance, 93% virgin area or natural						
Level and reinstate topography of drill traverses remove drill spoils	Ha	9	R222.14	R0.00	R0.00	R0.00
Backfilling of drill sumps	m³	0	R97.36	R0.00	R0.00	R0.00
Overburden dumps to be backfilled - loading and hauling >80m (CF 5)	m³	0	R14.87	R0.00	R0.00	R0.00
Overburden dumps to be backfilled (BS 1) - dozing <80m (CF 6)	m³	3846	R3.16	R12 153.36	R0.00	R12 153.36
Surface disturbance (BS 1) to be profiled (CF 7)	Ha	0.5	R27 480.00	R13 740.00	R0.00	R13 740.00
Remaining Overburden dumps & excavations (SD 3) to be profiled (CF 7)	Ha	5.17	R27 480.00	R142 071.60	R0.00	R142 071.60
Remaining Overburden dumps & excavations (SD 4) to be profiled (CF 7)	Ha	0.5	R27 480.00	R13 740.00	R0.00	R13 740.00
Remaining Overburden dumps & excavations (SD 5) to be profiled (CF 7)	Ha	0.37	R27 480.00	R10 167.60	R0.00	R10 167.60
Final clean-up - remove all mining related waste (CF 9)	Ha	6	R20 066.96	R120 401.76	R120 401.76	R0.00
Aftercare and Maintenance (CF 10)	Ha	6	R75.00	R450.00	R450.00	R0.00
			Sub-Total	**R312 724.32**	**R120 851.76**	**R191 872.56**
Block 2 ±378Ha 3.2% transformed, 0.4% surface disturbance, 96% virgin area or natural restoration						
Level and reinstate topography of drill traverses remove drill spoils	Ha	0	R222.14	R0.00	R0.00	R0.00
Backfilling of drill sumps	m³	0	R97.36	R0.00	R0.00	R0.00
Overburden dumps (OD 3) to be backfilled - loading and hauling >80m (CF 5)	m³	3000	R14.87	R44 610.00	R0.00	R44 610.00
Overburden dumps to be backfilled - dozing <80m (CF 6)	m³	0	R3.16	R0.00	R0.00	R0.00
Salvage Yard (IS 1) - np compacted areas (CF 8)	Ha	0.4	R3 160.00	R1 264.00	R0.00	R1 264.00
Remaining Overburden dumps & excavations (SD 8) to be profiled (CF 7)	Ha	0.5	R27 480.00	R13 740.00	R0.00	R13 740.00
Overburden dumps to be backfilled (BS 4) - dozing <80m (CF 6)	m³	13646.15385	R3.16	R43 753.85	R0.00	R43 753.85
Surface disturbance (BS 4) to be profiled (CF 7)	Ha	9.5	R27 480.00	R261 060.00	R0.00	R261 060.00
Final clean-up - remove all mining related waste (CF 9)	Ha	10	R20 066.96	R200 669.60	R200 669.60	R0.00
Aftercare and Maintenance (CF 10)	Ha	10	R75.00	R750.00	R750.00	R0.00
			Sub-Total	**R565 847.45**	**R201 419.60**	**R364 427.85**
Block 3 ±405Ha 0.6% transformed, 0% surface disturbance, 99.4% virgin area or natural restoration						
Level and reinstate topography of drill traverses remove drill spoils	Ha	0	R222.14	R0.00	R0.00	R0.00
Backfilling of drill sumps	m³	0	R97.36	R0.00	R0.00	R0.00
Overburden dumps to be backfilled - loading and hauling >80m (CF 5)	m³	0	R14.87	R0.00	R0.00	R0.00
Overburden dumps to be backfilled (BS 2) - dozing <80m (CF 6)	m³	12000	R3.16	R37 920.00	R0.00	R37 920.00
Overburden dumps to be backfilled (BS 3) - dozing <80m (CF 6)	m³	5800	R3.16	R17 898.00	R0.00	R17 898.00
Remaining Overburden dumps & excavations to be profiled (CF 7)	Ha	0	R27 480.00	R0.00	R0.00	R0.00
Final clean-up - remove all mining related waste (CF 9)	Ha	2.5	R20 066.96	R50 167.40	R50 167.40	R0.00
Aftercare and Maintenance (CF 10)	Ha	2.5	R75.00	R187.50	R187.50	R0.00
			Sub-Total	**R105 970.90**	**R50 354.90**	**R55 616.00**
Block 4 ±947Ha 0% transformed, 1% surface disturbance, 99% virgin area or natural restoration						
Level and reinstate topography of drill traverses remove drill spoils	Ha	0	R222.14	R0.00	R0.00	R0.00
Backfilling of drill sumps	m³	0	R97.36	R0.00	R0.00	R0.00
Overburden dumps to be backfilled - loading and hauling >80m (CF 5)	m³	0	R14.87	R0.00	R0.00	R0.00
Building rubble (IS 3) to be backfilled - loading and hauling >80m (CF 5)	m³	120	R14.87	R1 784.40	R0.00	R1 784.40
Prospecting Pits to be backfilled - dozing <80m (CF 6)	m³	800	R3.16	R2 528.00	R0.00	R2 528.00
Remaining Overburden dumps & excavations (SD 7) to be profiled (CF 7)	Ha	8	R27 480.00	R219 840.00	R0.00	R219 840.00
Final clean-up - remove all mining related waste (CF 9)	Ha	8	R20 066.96	R160 535.68	R160 535.68	R0.00
Aftercare and Maintenance (CF 10)	Ha	8	R75.00	R600.00	R600.00	R0.00
			Sub-Total	**R386 289.08**	**R161 135.68**	
Block 5 ±118Ha 0% transformed, 0% surface disturbance, 100% virgin area or natural restoration						
Level and reinstate topography of drill traverses remove drill spoils	Ha	0	R222.14	R0.00	R0.00	R0.00
Backfilling of drill sumps	m³	0	R97.36	R0.00	R0.00	R0.00
Overburden dumps to be backfilled - loading and hauling >80m (CF 5)	m³	0	R14.87	R0.00	R0.00	R0.00
Overburden dumps to be backfilled - dozing <80m (CF 6)	m³	0	R3.16	R0.00	R0.00	R0.00
Overburden dumps to be backfilled (BS 5) - dozing <80m (CF 6)	m³	4000	R3.16	R12 640.00	R0.00	R12 640.00
Remaining Overburden dumps & excavations to be profiled (CF 7)	Ha	0	R27 480.00	R0.00	R0.00	R0.00
Final clean-up - remove all mining related waste (CF 9)	Ha	1.3	R20 066.96	R26 087.05	R26 087.05	R0.00
Aftercare and Maintenance (CF 10)	Ha	1.3	R75.00	R97.50	R97.50	R0.00
			Sub-Total	**R38 824.55**	**R26 184.55**	
Block 6 ± 63Ha 3% transformed, 2% surface disturbance, 95% virgin area or natural restoration						
Level and reinstate topography of drill traverses remove drill spoils	Ha	0	R222.14	R0.00	R0.00	R0.00
Backfilling of drill sumps	m³	0	R97.36	R0.00	R0.00	R0.00
Overburden dumps (OD 1) to be backfilled - loading and hauling >80m (CF 5)	m³	10000	R14.87	R148 700.00	R0.00	R148 700.00
Overburden dumps (OD 2) to be backfilled - loading and hauling >80m (CF 5)	m³	5000	R14.87	R74 350.00	R0.00	R74 350.00
Overburden dumps to be backfilled - dozing <80m (CF 6)	m³	0	R3.16	R0.00	R0.00	R0.00
Overburden dumps to be backfilled (BS 6) - dozing <80m (CF 6)	m³	4000	R3.16	R12 640.00	R0.00	R12 640.00
Remaining Overburden dumps & excavations (SD 10) to be profiled (CF 7)	Ha	3	R27 480.00	R82 440.00	R0.00	R82 440.00
Final clean-up - remove all mining related waste (CF 9)	Ha	3	R20 066.96	R60 200.88	R60 200.88	R0.00
Aftercare and Maintenance (CF 10)	Ha	3	R75.00	R225.00	R225.00	R0.00
			Sub-Total	**R378 555.88**	**R60 425.88**	

Block 7 ±83Ha 8.5% transformed, 10.5% surface disturbance, 81% virgin area or natural restoration						
Level and reinstate topography of drill traverses remove drill spoils	Ha	0	R222.14	R0.00	R0.00	R0.00
Backfilling of drill sumps	m²	0	R97.36	R0.00	R0.00	R0.00
Overburden dumps to be backfilled - loading and hauling >80m (CF 5)	m³	0	R14.87	R0.00	R0.00	R0.00
Overburden dumps to be backfilled (OD 6) - dozing <80m (CF 6)	m³	10000	R3.16	R31 600.00	R0.00	R31 600.00
Overburden dumps to be backfilled (OD 7) - dozing <80m (CF 6)	m³	5000	R3.16	R15 800.00	R0.00	R15 800.00
Remaining Overburden dumps & excavations (SD 13) to be profiled (CF 7)	Ha	0.72	R27 480.00	R19 785.60	R0.00	R19 785.60
Remaining Overburden dumps & excavations (SD 14) to be profiled (CF 7)	Ha	4.28	R27 480.00	R117 614.40	R0.00	R117 614.40
Remaining Overburden dumps & excavations (SD 15) to be profiled (CF 7)	Ha	1.28	R27 480.00	R35 174.40	R0.00	R35 174.40
Remaining Overburden dumps & excavations (SD 16) to be profiled (CF 7)	Ha	0.26	R27 480.00	R7 144.80	R0.00	R7 144.80
Final clean-up - remove all mining related waste (CF 9)	Ha	5	R20 056.96	R120 401.76	R120 401.76	R0.00
Aftercare and Maintenance (CF 10)	Ha	5	R75.00	R450.00	R450.00	R0.00
				Sub-Total	R347 970.96	R120 851.76	
Block 8 ±81Ha 70% transformed, 20% surface disturbance, 10% virgin area or natural restoration						
Level and reinstate topography of drill traverses remove drill spoils	Ha	0	R222.14	R0.00	R0.00	R0.00
Backfilling of drill sumps	m²	0	R97.36	R0.00	R0.00	R0.00
Overburden dumps to be backfilled (OD 4) - loading and hauling >80m (CF 5)	m³	5000	R14.87	R74 350.00	R0.00	R74 350.00
Overburden dumps to be backfilled (OD 5) - loading and hauling >80m (CF 5)	m³	1000	R14.87	R14 870.00	R0.00	R14 870.00
Overburden dumps to be backfilled (OD 3) - dozing <80m (CF 6)	m³	20000	R3.16	R63 200.00	R0.00	R63 200.00
Overburden dumps to be backfilled (OD 6) - dozing <80m (CF 6)	m³	40000	R3.16	R126 400.00	R0.00	R126 400.00
Remaining Overburden dumps & excavations (SD 11) to be profiled (CF 7)	Ha	4	R27 480.00	R109 920.00	R0.00	R109 920.00
Remaining Overburden dumps & excavations (SD 12) to be profiled (CF 7)	Ha	4	R27 480.00	R109 920.00	R0.00	R109 920.00
Final clean-up - remove all mining related waste (CF 9)	Ha	10	R20 056.96	R200 569.60	R200 569.60	R0.00
Aftercare and Maintenance (CF 10)	Ha	10	R75.00	R750.00	R750.00	R0.00
				Sub-Total	R700 079.60	R201 419.60	R498 660.00
Total liability surface disturbance					R2 836 261.73	R942 643.73	R1 110 676.41

Total liability Final decommissioning and mine closure R1 070 366.01		
Total available R1 975 470.00		
Surplus available for Annual rehabilitation if not implimented R905 103.99		
Progressive Total liability annual rehabilitation plan	Available	Surplus after 2022
Outstading liability	R905 103.99	R109 170.79

7 The Public Participation Process

7.1 Principles and Objectives

The Public Participation Process (PPP) was designed to fulfil the requirements of several pieces of legislation applicable to mine closure. It forms an integral component of the mine closure process by affording Interested and Affected Parties (I&APs) the opportunity to identify environmental issues and concerns relating to the proposed closure, which they feel should be addressed. This is consistent with the provisions of the National Environmental Management Act (Act No. 107 of 1998), Section 2(4)(f), which states that "*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*".

The objective of the mining operation is to develop a working PPP that informs key stakeholders', I&APs and the general public about mine closure objectives and activities during the life of the mine. The PPP was designed to provide sufficient and accessible information to I&APs in an objective manner to assist them to:

- Identify issues of concern, and provide suggestions for enhanced benefits and alternatives associated with mine closure,
- Identify risks not yet identified during the risk assessment exercise,
- Identify risks associated with mine closure and rehabilitation,
- Contribute local knowledge and experience,
- Verify that their issues have been considered.
- Comment on the Risk Assessment and Mine Closure Plan at the time of final decommissioning of the project, including the significance of potential risks that have been identified and associated impacts,
- Play an oversight role in the monitoring and evaluation of mine closure.

7.2 Stakeholder Identification and Project Data Base

Existing data bases were used to inform the list of stakeholders. Special consideration was given to ensure that organizations and individuals that had expressed interest in the activities of the operation, and those who are potentially affected by mine closure, were included on the data base. The following are principles which governed the PPP:

- Key stakeholder groups and the general public comprised the target audience in the development of the PPP.
- Providing information to lay people to allow them to contribute to and participate meaningfully in the process.
- Stakeholder participation is most effective when the proponent and the practitioner recognise, acknowledge and validate stakeholder values when designing a PPP (i.e., there should be no underestimation of the technical and professional competence of citizens).
- The recognition that in the current political climate of South Africa, consultation, empowerment and capacity building is particularly important.

The process of involving stakeholders had three main objectives:

- Steps should be taken to ensure that stakeholder input into the project is relevant and representative.
- Stakeholders should be made aware of their objectives and role in the process,
- An efficient communication and feedback mechanism should be developed during the process to ensure that all stakeholders are kept informed of progress.

Stakeholders were drawn from the sectors outlined below:

- National (DWAS, DMR), Provincial (DENC, DALR) and Local Government (Local and District Municipalities)
- Industry (commercial farmers)
- Corporations and businesses (service providers to operation)
- Operations staff

The operation set up a database of I&APs using existing project databases as a starting point. Names of persons and organisations will be added to or deleted from the database where appropriate.

8 Way Forward

This Final Rehabilitation, Decommissioning and Mine Closure Plan will be reviewed on an annual basis to align such approved financial provision set out in regulations 9 and 11 of the NEMA Financial Provisioning Regulations, 2015 as amended. Concurrent rehabilitation and remediation will be provided for in the annual rehabilitation plan and will contain information that defines activities on an annual basis and how these relate to the closure vision, as detailed in this Final Rehabilitation, Decommission and Mine Closure Plan.

When final planned closure is applied for the operation will submit a final Environmental Performance Audit Report to DMR as lead agent for final perusal with the objective to issue a closure certificate. At that point, the closure process, and associated Public Participation Program, will close.