



FIDULEX (PTY) LTD

Rehabilitation Plan

REFERENCE NO: NW 30/5/1/2/2/2/10113MR

Prepared by:

JOAN CONSTRUCTION AND PROJECTS (PTY) LTD

Cell: 073 912 0800**Tel:** 011 074 6866

Fax: 086 235 5142

Email: joanprojects@gmail.com

Address: Unit D5, Westweed Office Park, 602 Kudu Street Allen's Nek,
Roodepoort, Johannesburg.

Postal Address: P O Box 4147, Honeydew, 2040

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1 Project Background

1.1 Introduction

Fidulex PTY (LTD) has appointed Joan Construction and Projects to apply for a mining right (for the mining of diamond) and the environmental authorisation to carry out mining activities, including bulk sampling on farm Palmietfontein 208 JP (portion of portion 5), located 16 Km Northwest of Sun City, in the North-West Province. The proposed project site covers a total of approximately 88Ha, and about 35 Ha of the site will be used for the mining operations.

As stated under the National Environmental Management Act Regulations, provision for the rehabilitation, closure and post closure of prospecting, mining or production operations has to be made during the environmental authorisation application stages and indicated in either the Basic Assessment Report or Environmental Impact Report.

1.2 Aims and Objectives

This rehabilitation plan aims to mitigate the impacts caused by the proposed mining activities and to restore land back to a satisfactory standard. In the South African context, the broad rehabilitation objectives include three schools of thought, explained below:

- Restoration of previous land use capability
- Restore as far as possible, the biodiversity of the area
- The affected parties play a role in determining the end land use

Rehabilitation/closure objectives need to be tailored for the Project at hand and be aligned with the Environmental Management Plan (EMP). Therefore, the overall rehabilitation objectives for the proposed project are as follows:

- Maintain and minimise impacts to the ecosystem within the study area
- Re-establishment of the pre-development land capability to allow for a suitable post mining land use
- Rehabilitate the disturbed area back to its natural state or as close as possible.
- Remove all infrastructure and all other items used during mining operation
- Remove and dispose of all waste types

- Final rehabilitation will be completed within specified period as guided by the Regional Manager
- Prevent soil, surface water and groundwater contamination;
- Maintain and monitor the rehabilitated areas.
- Comply with the relevant local and national regulatory requirements.

2 Description of the activities to be undertaken

The primary activities that will be carried out as part of the mining activities are detailed below in their respective phases. These phases include:

- The Construction Phase
- The Operational Phase
- The Decommissioning Phase

2.1 The Construction Phase

- **Site preparation:**

This phase will include the clearing of the site of any vegetation present where mining will be carried out, as well as additional areas that will be used for the listed associated facilities. Topsoil will be ripped, removed and stockpiled separately on a flat area. The stockpiled soil will be covered with a strong sack or vegetated to prevent erosion (the best or both preventative measure will be applied).

New mobile offices will be brought in to site. The diamond screening, scrubbing and sorting plant as well as all the required equipment will be placed on site. Existing lockable facilities for hazardous substances and bunded areas for small scale maintenance will be constructed.

- **Construction activities**

Following site preparation, the diamond plant and additional required mining infrastructure will be constructed on site. Construction activities include:

- The construction of a Processing Plant (with screening, a scrubber and sorter). The plant will be constructed together with their components (pipes etc.)

- The construction of a clean storm water dam and storm water drains that will channel the storm water to the dam, as well as a return water dam.
- The construction of a Septic Tank and associated infrastructures for containment/storage and transportation of sewage waste from the ablution facilities.
- The construction of a fence around the project site
- The construction of workshop where the maintenance of trucks and equipment will be done, as well as storage of used oil l.
- The construction of a small salvage yard for the sorting and temporal storage of different waste such as tyres, steel etc.

2.2 Operational Phase

During the operational phase, all mining activities and processes will be fully operational. The primary activities will include the opencast mining and processing of the diamondiferous ore material from the mining area. The activities are detailed below:

- **Excavation**

The diamondiferous ore material will be excavated using an excavator and front-end loader and bulks of the material will be loaded on to a truck. The material will then be transported to and loaded into the processing plant for processing. If necessary, blasting will take place and will comply to the mine health and safety requirements.

- **Screening**

The processing phase is lengthy and begins with crushing and screening the material. The material is crushed to loosen the large aggregates and retrieve smaller ore-containing material. Screening usually includes a barrel screen that scalps oversize material, standard screens that also further reduce unwanted oversize material and the Bivitec, which removes -5mm material. The removed material is then stockpiled on the waste rock dump and the required sized material is moved into the scrubber.

- **Washing**

Once the required sized materials have been obtained through screening, washing is the next step for removing yet finer diamonds from the abundance of mined diamond ore, using a

scrubber. Scrubbers process precious metals, base metal ores, minerals, aggregates, gravel and sand. They are designed to break up alluvial gravels, clay and sand. This is done through rotation and the force of particles hitting each other. As the scrubber rotates slowly, the fines are churned along with the oversize and water. As a result, the soil matrix is broken and the target material is liberated. Through this process, the diamonds are separated and abstracted from the remnant material. The muddy mixture of water and fines and oversize particles is discarded off at the slimes dam and the water draining from the slimes dam is directed to the return water dam.

- **Concentration/recovery**

A density based processing technology is usually used for alluvial processing. This is a particle density separation technique that relies on diamondiferous material being heavier than most of the gangue material. It typically reduces the incoming amount of material by 90%, concentrating heavy minerals. The required diamonds are recovered in this manner and the remaining material is discarded.

2.3 Decommissioning

Concurrent rehabilitation will be carried out throughout the life of the mine. During operation mined out pits will be backfilled and rehabilitated whilst mining operations proceed on other parts of the project site. The blasted and excavated pits will be backfilled with waste rock and the removed topsoil will be put back for vegetation growth. Where necessary, the slopes surface will also be graded to establish a safer slope. Backfilled areas will then be revegetated.

Upon completion of all mining operations, the entire project site will be rehabilitated. All equipment, infrastructure and mobile facilities will be removed from site, and any concrete structures including foundations will be bulldozed.

3 Rehabilitation Actions

The rehabilitation actions contained within this section are to be implemented at closure. The rehabilitation actions are based on the guidelines set out by the Department of Minerals Resources which outline the methods for rehabilitation required for closure.

3.1 Opencast Area Rehabilitation

It is assumed that approximately 35ha of land will be disturbed during the mining operation. The purpose of pit closure is to ensure the pits become safe for humans and animals. After the mining activities are completed, the pits will be backfilled with the waste rock from the pit and uncontaminated historic waste rock adjacent to the pits. The pits will also be filled with up to 300mm thick of topsoil. If not filled to the surface, the slopes will be graded and shaped/sloped to a desired land form which is safe and that will suite the land use after rehabilitation.

3.2 Processing Plant

A mobile plant will be used for the processing activities, therefore no infrastructure associated with the plant will need to be stripped and broken down at closure. Cost has only been allocated for the general surface rehabilitation of the plant area. The general surface rehabilitation will ensure the following:

- All structures and surface infrastructure are removed and the rehabilitated area left clean, neat and emulates the natural scenery of the surroundings. Special attention must be given to shape and/or removal of heaps of excess material; and the area should suitable for vegetation.
- The surface topography emulates the surrounding areas and is aligned to the general landscape character;
- The Landscaping follows the original drainage patterns of the area, facilitates surface runoff and results in free draining areas.

3.3 Processing water & Storm Water dams

- The processing and storm water dams will be removed at closure.
- The earth walls will be flattened, all concrete structures will be removed and the area profiled.

- The pipes associated with the dam must be removed and if possible sold.

3.4 Stockpile Areas

- Material from the waste rock stockpiles and tailings will be utilized to backfill excavated pits during the ongoing process of concurrent rehabilitation during throughout the life of the mine.
- The backfilled areas should be tested for soil fertility. Should the top soil prove to have lost much of its initial nutrient content, the top soil should be fertilised.
- Ensure that all backfilled areas are sufficiently shaped to blend in with the surrounding environment, and revegetated.

3.5 Access Roads

- Access roads around the site should be ripped for all areas except those needed to access the facilities for inspection after closure. Where vegetation has been removed, 300mm of topsoil should be added and thereafter revegetated
- Roads that will be used by other users post closure should, however, can be left for continual use, provided this is agreed upon by all parties concerned.

3.6 Re - Vegetation and Biodiversity Establishment

The main aim of re-vegetation for the study area is to restore the area to the indigenous Bushveld. It is advised to restore the study area as far as possible to a stable and sustainable ecosystem. The overall objectives for the re-vegetation of reshaped and top soiled land are to:

- Prevent erosion;
- Restore the land to the agreed land capability;
- Re-establish eco-system processes to ensure that a sustainable land use can be established without requiring fertilizer additions; and
- Restore the biodiversity of the area as far as possible.

The following are the required rehabilitation measures to aid biodiversity establishment:

- All vehicles, plant and equipment will be removed for salvage or resale.

- Where sites have been alienated of vegetation or where soils have been compacted or covered with concretes, the sites will be ripped and ploughed. The topsoil shall be appropriately fertilized to allow vegetation to grow rapidly.
- All disturbed and exposed surfaces will be covered with at least 300mm of topsoil and re-vegetation must be allowed to take place naturally.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptable slow, the soil need to be analyzed and any deleterious effects must be corrected and the area be seeded with a seed mix to specification. The areas should be vegetated with vegetation indigenous to the area as indicated in the biodiversity report.
- All alien and invader plants and weeds introduced to the site through the proposed activities shall be dealt with as required in the alien invasive species plan attached to the biodiversity assessment.

3.7 Maintenance and Aftercare

Maintenance and aftercare must be planned for 2-3 years after the land preparation and re-vegetation has been completed. Maintenance will be carried out for the purpose of ensuring the following:

- Annual fertilising of the rehabilitated area should assessments indicate the need,
- Control of all other alien plants and
- General maintenance, including rehabilitation subsided and eroded areas with gullies.

Continuous erosion monitoring of rehabilitated areas and slopes should be undertaken and zones with excessive erosion should be identified. The cause of the erosion should be identified, and rectified. Zones with erosion will need to be repaired with topsoil and re-vegetated.

4 Financial Provision for Rehabilitation

Closure liability costs were calculated by means of the DMR's 2017 standard method for assessment of mine closure. The approach followed during these calculations was to assume a planned closure.

A summary of the calculated environmental liability costs is presented in the table overleaf. The cost for rehabilitation and closure of the site according to the DMR 2017 Quantum of finance is ZAR9,520,995.07.

No.	Description	Unit	A	B	C	D	E=A*B*C*D
			Quantity	Master Rate	Multiplication factor	Weighting factor 1	Amount (Rands)
1	Dismantling of processing plant and related structures	m3	0	13.7	1	1	0
2 (A)	Demolition of steel buildings and structures	m2	0	190.3	1	1	0
2(B)	Demolition of reinforced concrete buildings and structures	m2	0.425	280.46	1	1	119.1955
3	Rehabilitation of access roads	m2	0	34.05	1	1	0
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	330.5	1	1	0
4 (A)	Demolition and rehabilitation of non-electrified railway lines	m	0	180.3	1	1	0
5	Demolition of housing and/or administration facilities	m2	0	380.6	1	1	0
6	Opencast rehabilitation including final voids and ramps	ha	30	193716.3	1	1	5811489
7	Sealing of shafts adits and inclines	m3	0	102.17	1	1	0
8 (A)	Rehabilitation of overburden and spoils	ha	2.5	133017.19	1	1	332542.975
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0	165670.5	1	1	0
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0	481185.7	1	1	0
9	Rehabilitation of subsided areas	ha	0	111381.9	1	1	0
10	General surface rehabilitation	ha	2	105372.05	1	1	210744.1
11	River diversions	ha	0	105372.05	1	1	0
12	Fencing	m	0	120.2	1	1	0
13	Water management	ha	0	40065.4	1	1	0
14	2 to 3 years of maintenance and aftercare	ha	35	14022.9	1	1	490801.5
15 (A)	Specialist study	Sum				1	0
15 (B)	Specialist study	Sum				1	0
					Sub Total 1		6845696.771
1	Preliminary and General		821483.6125		weighting factor 2		821483.6125
					1		
2	Contingencies		684569.6771				684569.6771
					Subtotal 2		8351750.06
					VAT (14%)		1169245.01
					Grand Total		ZAR 9,520,995.07