



# mineral resources

Department:  
Mineral Resources  
**REPUBLIC OF SOUTH AFRICA**

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Date: 15 November 2010

From: Mine Environmental Management Enquiries: Mr. Bradley Nethononda

### Registered Mail

The Director  
South African Heritage Resources Agency  
PO Box 4637  
CAPE TOWN  
8000



Dear Sir / Madam

**CONSULTATION IN TERMS OF SECTION 40 OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT 2002, (ACT 28 OF 2002) IN RESPECT OF DIAMONDS FOR THE APPROVAL OF AN ENVIRONMENTAL MANAGEMENT PLAN FOR A PROSPECTING RIGHT ON A PORTION OF ERF 516, PORT NOLLOTH SITUATED IN THE ADMINISTRATIVE DISTRICT OF NAMAQUALAND, NORTHERN CAPE REGION.**

**APPLICANT: DANSILE NXIKWE DIAMONDS CC**

Attached herewith, please find a copy of an EMP received from the above-mentioned applicant, for your comments.

It would be appreciated if you could forward any comments or requirements your Department may have to this office and to the applicant before **31 December 2010** as required by the Act.

Consultation in this regard has also been initiated with other relevant State Departments. In an attempt to expedite the consultation process please contact **Mr. Bradley Nethononda** of this office to make arrangements for a site inspection or for any other enquiries with regard to this application.

Your co-operation will be appreciated.

pp  
**REGIONAL MANAGER: MINERAL REGULATION  
NORTHERN CAPE REGION**



File number: SNC 30/5/1/1/2/943PR

DEPARTMENT OF MINERALS AND ENERGY

# ENVIRONMENTAL MANAGEMENT PLAN

Submitted in support of application for a prospecting right  
Section 39 and Regulation 52 of the Minerals and Petroleum Resources Development  
Act, 2002 (Act 28 of 2002)



Application for a:

Prospecting Right	
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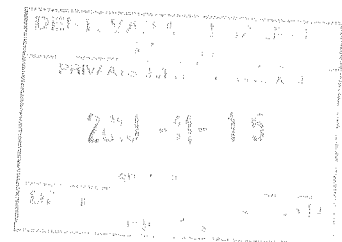
**Applicant:** Dansile Nxikwe Diamonds CC

**Farm:** Portion of Erf 516 Port Nolloth

**District:** Namaqualand

**Mineral:** Diamonds

**Date:** 19 October 2010



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## **A.1 INTRODUCTION**

This document aims to comply with the relevant legislation and environmental regulations as apply to applications in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002)(MPRDA).

## **A.2 SCOPE**

This document is intended for use by applicants for mining permits and prospecting rights. Typically, operations in this sector of the mining industry:

- Use little or no chemicals to extract mineral from ore,
- Work on portions of land of 1,5 hectares in size or smaller,
- Disturb the topography of an area somewhat but have no significant impact on the geology

## **A.3 PURPOSE**

This document aims to :

- Provide a national standard for the submission of Environmental Management Plans for the types of applications mentioned above.
- Ensure compliance with Regulation 52 of the MPRDA.
- Assist applicants by providing the information that the Department of Minerals and Energy (DME) requires in a simple language and in a structured, prescribed format, as contemplated in Regulation 52 (2) of the (MPRDA).
- Assist regional offices of the DME to obtain enough information about a proposed prospecting operation to assess the possible environmental impacts from that operation and to determine corrective action even before such right is granted and the operation commences.

## **A.4 USE OF THE DOCUMENT:**

The aim is ultimately to (a) gather information from applicants themselves; (b) to assess the impact of the operation based on that information and then (c) to guide the applicant to mitigate environmental impacts to limit damage to the environment.

Section B of the document gathers demographic information about the applicant. Section C gathers the information that will be used in the Environmental Impact Assessment. The scoring of these for the impact assessment rating in Section D. Section F (the Environmental Management Plan) of the document is prescriptive and gives guidance to the prospector on how to limit the damage of the operation on the environment. This part may be added to by the regional manager, who has the prerogative to decide whether this Environmental Management Plan will adequately address the environmental impacts expected from the operation or whether additional requirements for proper environmental management need to be set. Where these additional requirements are set, they will appear in Section G of this document. The Environmental Management Plan (Section F) of the document is legally binding once approved and, in the undertaking contained in Section H, the applicant effectively agrees to implement all the measures outlined in this Environmental Management Plan.

## A.5 LEGISLATION/ REGULATIONS

The relevant sections of Mineral and Petroleum Resources Development Act and its supporting Regulations are *summarised below* for the information of applicants. The onus is on the applicant to familiarise him/herself with the provisions of the full version of the Mineral and Petroleum Resources Development Act and its Regulations.

Section of Act	Legislated Activity/ Instruction/ Responsibility or failure to comply	Penalty in terms of Section 99
5(4)	No person may prospect, mine, or undertake reconnaissance operations or any other activity without an approved EMP, right, permit or permission or without notifying land owner	R 100 000 or two years imprisonment or both
19	Holder of a Prospecting right must: lodge right with Mining Titles Office within 30 days; commence with prospecting within 120 days, comply with terms and conditions of prospecting right, continuously and actively conduct prospecting operations; comply with requirements of approved EMP, pay prospecting fees and royalties	R 100 000 or two years imprisonment or both
20(2)	Holder of prospecting right must obtain Minister's permission to remove any mineral or bulk samples	R 100 000 or two years imprisonment or both
26(3)	A person who intends to beneficiate any mineral mined in SA outside the borders of SA may only do so after notifying the Minister in writing and after consultation with the Minister.	R 500 000 for each day of contravention
28	Holder of a mining right or permit must keep records of operations and financial records AND must submit to the DG: monthly returns, annual financial report and a report detailing compliance with social & labour plan and charter	R 100 000 or two years imprisonment or both
29	Minister may direct owner of land or holder/applicant of permit/right to submit data or information	R 10 000
38(1)(c)	Holder of permission/permit/right MUST manage environmental impacts according to EMP and as ongoing part of the operations	R 500 000 or ten years imprisonment or both.
42(1)	Residue stockpiles must be managed in prescribed manner on a site demarcated in the EMP	A fine or imprisonment of up to six months or both
42(2)	No person may temporarily or permanently deposit residue on any other site than that demarcated and indicated in the EMP	A fine or imprisonment of up to six months or both
44	When any permit/right/permission lapses, the holder may not remove or demolish buildings, which may not be demolished in terms of any other law, which has been identified by the Minister or which is to be retained by agreement with the landowner.	Penalty that may be imposed by Magistrate's Court for similar offence
92	Authorised persons may enter mining sites and require holder of permit to produce documents/ reports/ or any material deemed necessary for inspection	Penalty as may be imposed for perjury
94	No person may obstruct or hinder an authorised person in the performance of their duties or powers under the Act.	Penalty as may be imposed for perjury
95	Holder of a permit/right may not subject employees to occupational detriment on account of employee disclosing evidence or information to authorised person (official)	Penalty as may be imposed for perjury
All sections	Inaccurate, incorrect or misleading information	A fine or imprisonment of up to six months or both
All sections	Failure to comply with any directive, notice, suspension, order, instruction, or condition issued	A fine or imprisonment of up to six months or both

## A.6 OTHER RELEVANT LEGISLATION

Compliance with the provisions of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) and its Regulations does not necessarily guarantee that the applicant is in compliance with other Regulations and legislation. Other legislation that may be immediately applicable includes, but are not limited to:

- National Monuments Act, 1969 (Act 28 of 1969).
- National Parks Act, 1976 (Act 57 of 1976)
- Environmental Conservation Act, 1989 (Act 73 of 1989)
- National Environmental Management Act, 1998 (Act No. 107 of 1998)
- Atmospheric Pollution Prevention Act, 1965 (Act 45 of 1965)
- The National Water Act, 1998 (Act 36 of 1998)
- Mine Safety and Health Act, 1996 (Act 29 of 1996)
- The Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983).

## A.7 WORD DEFINITIONS

In this document, unless otherwise indicated, the following words will have the meanings as indicated here:

<b>Act (The Act)</b>	Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002)
<b>Borehole</b>	A hole drilled for the purposes of prospecting i.e. extracting a sample of soil or rock chips by pneumatic, reverse air circulation percussion drilling, or any other type of probe entering the surface of the soil.
<b>CARA</b>	The Conservation of Agricultural Resources Act
<b>EIA</b>	An Environmental Impact Assessment as contemplated in Section 38(1) (b) of the Act
<b>EMP</b>	an Environmental Management Plan as contemplated in Section 39 of the Act
<b>Fauna</b>	All living biological creatures, usually capable of motion, including insects and predominantly of protein-based consistency.
<b>Flora</b>	All living plants, grasses, shrubs, trees, etc., usually incapable of easy natural motion and capable of photosynthesis.
<b>Fence</b>	A physical barrier in the form of posts and barbed wire and/or "Silex" or any other concrete construction, ("palisade"- type fencing included), constructed with the purpose of keeping humans and animals within or out of defined boundaries.
<b>House</b>	any residential dwelling of any type, style or description that is used as a residence by any human being
<b>NDA</b>	National Department of Agriculture
<b>NWA</b>	National Water Act, Act 36 of 1998
<b>Pit</b>	Any open excavation
<b>"Porrel"</b>	The term used for the sludge created at alluvial diamond diggings where the alluvial gravels are washed and the diamonds separated in a water-and-sand medium.
<b>Topsoil</b>	The layer of soil covering the earth which- <ol style="list-style-type: none"> <li>(a) provides a suitable environment for the germination of seed;</li> <li>(b) allows the penetration of water;</li> <li>(c) is a source of micro-organisms, plant nutrients and in some cases seed; and</li> <li>(d) is not of a depth of more than 0,5 meters or such depth as the Minister may prescribe for a specific prospecting or exploration area or mining area.</li> </ol>
<b>Trench</b>	A type of excavation usually made by digging in a line towards a mechanical excavator and not pivoting the boom – a large, U-shaped hole in the ground, with vertical sides and about 6 – 8 meters in length. Also a prospecting trench.
<b>Vegetation</b>	Any and all forms of plants, see also Fauna

<b>DWAF</b>	The Department of Water Affairs and Forestry – both national office and their various regional offices, which are divided across the country on the basis of water catchment areas.
<b>MPRDA</b>	the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002)
<b>EMPlan</b>	An Environmental Management Plan as contemplated in Regulation 52 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) – this document.



**B. BIOGRAPHIC DETAILS OF THE APPLICANT:**

<b>B 1.1 Full name of company applying for permit</b>	<b>Dansile Nxikwe Diamonds CC</b>
<b>B 1.2 Registration number</b>	<b>2003/019139/23</b>
<b>B 1.3 Postal address</b>	<b>P.O. Box 680</b>
	<b>7580</b>
<b>B 1.4 Physical address</b>	<b>19 Koekkoek Street</b>
	<b>Amandelsig</b>
	<b>Kuilsrivier 7579</b>
<b>B 1.5 Applicant's telephone number</b>	<b>021 9031831</b>
<b>B 1.6 Applicant's fax number</b>	<b>021 9031831</b>
<b>B 1.7 Alternative contact's name</b>	<b>Abri Zaaiman</b>
<b>B 1.8 Alternative contact's telephone numbers</b>	<b>071 3399667</b> <b>abri@procyan.co.za</b>
<b>B 2.1 Full name of the property on which mining operations will be conducted</b>	<b>Portion of Erf 516 Port Nolloth</b>
<b>B 2.2 Name of the subdivision</b>	<b>NA</b>
<b>B 2.3 Approximate center of mining area</b>	<b>Latitude S29.26552° South</b> <b>Longitude E16.90331° East</b>
<b>B 2.4 Magisterial district</b>	<b>Namaqualand</b>
<b>B 2.5 Name of the registered owner of the property</b>	<b>Richtersveld Munisipality</b>
<b>B 2.6 His Telephone number</b>	
<b>B 2.7 His Postal address</b>	<b>Private Bag X113</b> <b>Port Nolloth 8280</b>
<b>B 2.8 Current uses of surrounding areas</b>	
	<b>Zoned as agricultural land mainly communal stock farming</b>
<b>B 2.9 Other, existing land uses that impact on the environment in the proposed prospecting area?</b>	
	<b>Historic diamond mining</b>
<b>B 2.10 Name of the nearest town?</b>	
	<b>Port Nolloth 3Km West</b>

**C. ENVIRONMENTAL IMPACT ASSESSMENT:**

The information provided in this section will enable officials to determine how serious the impact of the mining operation will be.

**C.1 DESCRIPTION OF THE ENVIRONMENT LIKELY TO BE AFFECTED BY PROPOSED MINING OPERATIONS: (REGULATION 52(2)(a))**

<b>ENVIRONMENTAL ELEMENT/ IMPACTOR</b>	<b>VALUE</b>	<b>TICK</b>	<b>OFFICE USE</b>
<b>C 1.1 Description of the landscape surrounding the proposed operation.</b>			
The regional topography surrounding the area is generally flat lying coastal plain, with undulations relating to incised episodic drainage channels and the non-perennial River valleys. About 15 km east of the prospecting area, the topography takes on a hilly form of Namaqualand (See appendix 1). The land dips very gently toward the southeast.			
<b>C 1.2 Description of the type of soil found on the surface of the site</b>			
Bedrock in the area consists of a series of schists and granite gneisses of the Namaqualand Metamorphic Complex covered by sands, calcretes and dorbank. The diamonds in this alluvial deposit are found both in the basal lag of the palaeo channels, and in potholes scoured into the softer schist bands. The palaeo channels in these deeper plunge pool environments are sealed by sandstone, and elsewhere by cemented sands, dorbank and calcrete.			

The gravels (0.1 to 1.0 m thick) are invariably white quartz pebbles and cobbles with a sprinkling of larger boulders. Smokey quartz is common. The gravels vary from loose cemented to very hard conglomerate. Red Kalahari sand (Hutton) overlies the entire site except where disturbed by previous mining. The upper 10cm sandy soil contains a little humus and grass seed. This is underlain by sand of similar type, and is on average a further 40 cm thick. It generally overlies dorbank and/or silcrete and/or clay. Given the high sand content of this material as well as the lack of vegetation cover, it is very susceptible to erosion (particularly wind erosion) and gully erosion in areas where storm-water is allowed to concentrate. The subsoil (the overburden in this case) consists of various layers of sand, clayey sand/silt, dorbank and silcrete up to a maximum of 10m in depth.

<b>C 1.3 Depth of topsoil</b>	0 – 300mm		8
	300 – 600mm	X	4
	600mm +		2

#### **C 1.4 Natural vegetation around the site.**

Most plant growth is restricted to the relatively shallow topsoil layer. Plant rooting systems favors extensive networks of shallow roots.

The area falls within the coastal plain (Strandveld) vegetation of the succulent karoo biome. Strandveld vegetation varies in height and this is associated with depth of calcareous sands. Short forms of plants occur on exposed calcretes and characterised by the presence of the following dominant species: *Ehrharta calycina*, *E. villosa*, *Protasparagus capensis*, *Tetragonia frutescens* and *Zygophyllum morgansa*. Plants which are drought-deciduous with succulent leaves are fairly common.

**Short Strandveld** is found on shallow soils with little storage of moisture. Plants reflect the aridity of the substrate, are very short and considerably succulent. Projected vegetation cover of perennial species is usually less than 50%. Heuweltjies are prominent features and the plant community found on these show an increase in the dwarf succulent components, grading into Succulent Karoo vegetation with an increase in distance from the sea. Dominant species in this short Strandveld vegetation includes *Cephalophyllum spongiosum*, *Galenia fruticosa*, *Mesembryanthemum barklyii*, *Othona longifolia*, *Zygophyllum cordifolium* as well as *Ruchsia spp.*

**Medium Strandveld** has taller shrubs and a greater grass component. Canopy cover is in the range of 50% to 60% resulting in a "pockmarked" appearance to the veld. Typical dominant species include *Arctotis merxmuelleri*, *Cephalophyllum spp*, *Drosanthemum spp*, *Manochlamys albicans* and *Ruchsia robusta*.

**Tall Strandveld** occurs where deeper calcareous sands occur. It is fairly dense with a canopy cover of 65% to 75%. These 1m to 2m tall shrubs are dominated by *Ericophalus racemosus*, *Salvia aurea* and *Zygophyllum morgansa*. The tall Strandveld vegetation takes years to develop to its full potential. Inland from the coast overgrazing can lead to irreversible changes and Cape Fynbos elements take over this niche. The only trees occur along the bank of the drainage channels and is represented by *Acacia karoo*.

The Namaqualand Coastal Belt succulent scrub on site is dominated by:

- Non-succulents including:
  - *Galenia fruticosa* and *G. africana* (kraalbos)
  - *Salsola cf. kali* (tumbleweed)
  - *Zygophyllum sp.*
  - *Salsola aphylla* (Iye - ganna)
  - *Salsola calluna* (swartganna)
  - *Tetragonia spicitata*

Succulents including:

- *Euphorbia sp.*
- *Crassula sp.*
- *Ruschia sp.*

The natural vegetation type per se is not a threatened unit and because of the extensive previous disturbance of this site (other than the proposed prospecting) no specific botanical survey was conducted to measure the local & regional conservation worthiness, but wish to reflect on the following aspects to reduce any potential impact:

- Movement areas must be clearly demarcated and any movement outside of these areas must not be allowed
- No ad hoc roads, dumping or topsoil borrowing

Observations have revealed that:

- Red aeolian topsoil, if placed on rehabilitated surfaces, no matter how thin (suggested min 25mm) promotes pioneer re-vegetation during the first season followed by Mesembryanthenums by year 3
- Topsoil, if directly re-used has immediate re-vegetation results given the seed bank present in the topsoil.
- Un-topsoiled subsoil, dumps or disturbed areas do not re-vegetate

#### **C 1.5 Natural fauna occurring in the area.**

No rare species were reported and given the extent of similar land types in the area, any rare or endangered species will migrate to the surrounding habitat. Large herbivores are absent due to the competitive land use.

<b>C 1.6 Protected areas close to the proposed operation.</b>	Yes		4
	No	X	0

#### **C 1.7 Mineral to be prospected for**

**Diamonds**

#### **C 1.8 Description of type of equipment that will be used:**

The mineral resource and mineral distribution of the prospecting area will be determined through a process of geo-physical work as an initial phase..

Some of the historic trenches will then be cleaned to bedrock to test the gravels for mineralisation.

Samples (prospecting pits of 25m<sup>2</sup> and approximately 33 tonnes in weight per meter advance) will then be recovered to determine the amount of mineralisation through the recovery and treatment of samples. Pitting will be conducted by mechanical means with a 30-ton excavator.

The topsoil and overburden comprising approximately 75% of the volume will be placed on the banks of the pits in windrows and the gravel will be removed to the recovery plant area with dumpers or Articulated Dump Trucks (ADTs). The position of the plant will be determined relative to the position of the trenches. Bulk samples by means of trenching may be required to supplement the sampling program depending on the results and where depth constraints will allow. Prospecting trenches planned to cross the entire width of the palaeochannels (therefore of variable length) and up to 8 meters wide and maximum 10m in depth, may be excavated to allow a Diamond Ore Characterisation (DOC) study for metallurgical purposes and to allow the sufficient recovery of diamonds for evaluation and foot printing purposes.

The trenches are to be developed as follows:

1. Remove topsoil to 10cm depth and place to the side
2. Remove overburden and dump to the other side
3. Remove gravel and process at the central plant
4. Record the grades
5. Whether the pit yields positive results or not, the pit must be backfilled - overburden first then the topsoil.

The number of trenches will be determined after the initial Geo-physical work and sampling program. The layout plans will be updated together with regular performance assessments and an update of the financial provisions in place for rehabilitation as the prospecting program advances. See prospecting work program appendix 2 for details

**C.2 IMPACT OF THE PROPOSED OPERATION ON THE NATURAL ENVIRONMENT?  
(REGULATION 52(2)(b))**

<b>C 2.1 Ultimate depth of the proposed prospecting operations.</b>	0 – 5m		2
	6 – 10m	X	4
	10 – 25m		8
	25m +		10
<b>C 2.2 Total area of all excavations.</b>	<b>Less than 5</b> ha		
<b>C 2.3 Size of each excavation before it is filled.</b>	<10 X 10m		2
	<20 X 20m		4
	>20 X 20m	X	8
<b>C 2.4 Number of prospecting trenches.</b>	<b>2</b>		
<b>C 2.5 Preparation of food on the site.</b>	Yes	X	2
	No		0
<b>Collection of firewood on the site.</b>	Yes		2
	No	X	0
<b>C 2.6 Extraction of water for use by the proposed operation.</b>	Yes		4
	No	X	2
<b>C 2.7 Name of this water body</b>	<b>NA</b>		
<b>C 2.8 Other water source, where will it be obtained?</b>	Drinking water will be trucked in to the mine, and no water is needed for RC drilling. Water for the plant when constructed will be obtained from the recycled water of the town's oxidation dams.		
<b>C 2.9 Volume of water per day needed for the mineral processing operation</b>	1000 – 10 000 Liters	X	2
	20 000 – 40 000 L		3
	Water will only be needed if a mobile plant is installed		5
	To process the bulk samples.		8
	60 000 – 100 000L		8
	More		10
	None	X	
<b>C 2.10 Distance of operation from open water</b>	0 – 15m		8
	16 – 30m		6
	31 – 60m		4
	More than 60 metres	X	2

<b>C 2.11 Estimated depth of the water table</b>		<b>&gt;20</b>	metres
<b>C 2.12 Water per day to be utilize for employees</b>	Water available at living quarters in town		Liters
<b>C 2.13 Toilet facilities to be made available to workers?</b>	None		8
	Pit latrine (longdrop)		4
	Chemical toilet	<b>X</b>	2
<b>C 2.14 Construction of roads to access the operations</b>	Yes		4
	No	<b>X</b>	0
<b>C 2.15 Distance of access road(s) to be constructed from a public road to the proposed operations</b>	0 – 0,5 km	<b>X</b>	0
	0,6 – 1,5 km		2
	1,6 – 3 km		4
<b>C 2.16 Trees to be uprooted to construct these access road(s)</b>	Yes		4
	No	<b>X</b>	0
<b>C 2.17 Foreign material, other than the naturally occurring topsoil be placed on the road surface?</b>	Yes		4
	No	<b>X</b>	0

**C.3 TIME FACTOR**

<b>C 3.1 Time period that mining operations will be conducted on this particular site?</b>	0 – 6 months		2
	6 – 12 months		4
	12 – 18 months		6
	18 – 24 months		8
	>24 months	<b>X</b>	10

**C.4 HOW WILL THE PROPOSED OPERATION IMPACT ON THE SOCIO-ECONOMIC ENVIRONMENT? (REGULATION 52(2)(b))**

ELEMENT/ IMPACTOR	VALUE	TICK	OFFICE USE
<b>C 4.1 Number of people to be employed</b>	• Sub contractors		
<b>C 4.2 Number of men</b>	•		
<b>C 4.3 Number of women</b>	•		
<b>C 4.4 Where will employees be obtained?</b>	Own		2
	Local	<b>X</b>	4
<b>C 4.5 How many hours per day will employees work?</b>	Sunrise → Sunset		4
	Less	<b>X</b>	2
	More		8
<b>C 4.6 Will operations be conducted within 1 kilometer from a residential area</b>	Yes		6
	No	<b>X</b>	1
<b>C 4.7 How far will the proposed operation be from the Nearest infrastructure?</b>	0 – 50 metres		8
	51 – 100 metres		4
	150 or more metres	<b>X</b>	2

**C.5 IMPACT ON THE CULTURAL HERITAGE OF THE SURROUNDING ENVIRONMENT? REGULATION 52(2)(b)**

ELEMENT/ IMPACTOR	VALUE	TICK	OFFICE USE
<b>C 5.1 Any graveyards or sites of historic significance within 1 kilometer of the area?</b>	Yes		8
	No	<b>X</b>	0

Given the small extent of the activities during limited RC drilling and cleaning of existing trenches no phase 1 archaeological study has been conducted. Drilling will be limited to areas that is already disturbed by existing tracks as far as possible. As there is a great chance of fossils and or middens being present on the site an archaeological study will be completed before any earth moving operations on virgin soil are conducted. Should any fossils be discovered or unearthed in the process of drilling, the applicant will contact a South African Museum or University which employs palaeontologists so that the necessary palaeontological salvage operations can take place. The position of the drill hole will also be shifted to exclude such sites. No other heritage resources such as built structures over 60 years old, sites of cultural significance associated with oral histories, burial grounds and graves, graves of victims of conflict, and cultural landscapes or viewsapes are present on the prospecting area.

## **C.6 SPECIFIC REGULATORY REQUIREMENTS**

### **C.6.1 Air quality Management and Control (Regulation 64):**

Existing pre-mining dust is generated through the following:

Dust generated by wind over un-vegetated or denuded areas.

Dust generation off un-surfaced roadways on site .

Given the surrounding extent of semi-desert, dust generation is high under windy conditions (dust storm), however under normal conditions no extreme dust conditions are noted on site.

Exploration activities will take place in a very remote area and dust generation will be limited to a small radius around the drilling operation. If the dust however becomes a nuisance or health risk, dust will be suppressed with spraying water and/or dust-allaying agents.

### **C.6.2 Fire Prevention (Regulation 65)**

Not an application for coal or bituminous rock.

### **C.6.3 Noise control (Regulation 66)**

Only traffic-generated noise occurs in the area at present and such noise levels are low (observed estimate at  $\pm 55$  dBA).

Noise from earth moving equipment and machinery will be within the norm and due to the remote locality of the operation will have no impact.

### **C.6.4 Blasting, vibration and shock (Regulation 67)**

Note that approximately 120% of the overburden is highly cemented (based on exposure seen thus far) and will require drilling and blasting.

### **C.6.5 Disposal of waste material (Regulation 69)**

No domestic or industrial waste will be disposed of on site. Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., shall be stored in a container at a collecting point and collected on a regular basis and disposed of at a recognized disposal facility. No waste will be buried or burned on the site. No Hazardous waste like oil filters and used oil will be generated as all repairs and services will be done at a workshop in Port Nolloth

### **C.6.6 Soil pollution and erosion control (Regulation 70)**

#### **C.6.6.1 Topsoil**

Given the extremely low rainfall, high evaporation rate, permeability of the soils and the lack of pollutants used in the mining process, no storm water management system nor pollution control/evaporation dams will be required.

#### **6.6.2 Description of how spills of oil, grease, diesel, acid or hydraulic fluid will be dealt with.**

There are no pollutants other than oil and diesel used in the prospecting operation. As such no polluted water treatment facility is provided.

During prospecting the following management measures will be applicable:

#### Oil and Grease

- Machinery will not be extensively repaired in any place other than in the workshops in Port Nolloth. No infrastructure will be constructed during prospecting as facilities are available at Port Nolloth.
- Temporary work bays for emergency repairs must be provided with an PVC lining with an oil trap from which oil can be bailed out.
- When emergency repairs must be done on site care must be taken not to spill fuel or oil into the soil through the use of drip trays and proper funnels and containers to catch drained oil. If such spill occurs the soil must be removed to drums and hauled as waste for disposal at the municipal site or by Oilkol. Any remaining contaminated soil shall be treated in-situ with Spilisorb or similar product.

#### Diesel

- Fuel for the earth moving equipment will be stored in mobile tanker trailer.
- Accidental spills will be cleaned up immediately by removing the spillage together with the polluted soil and by disposing of them at a recognised facility.
- Any diesel contamination of soils to be removed and residual soil to be treated with Spilisorb or similar product.
- In the case of a large accidental spill, the staff shall be trained to react as follows:
  - to use any available equipment, shovels, front end loaders, etc. to rapidly construct berms which will contain the spill to a minimum area; and
  - to notify management without delay in order that assistance can be provided, after ensuring that there is no fire or other danger to themselves.
- Equipment used in the prospecting process will be adequately maintained so that during operations it does not spill oil, diesel, fuel, or hydraulic fluid.
- Bore hole sites are GPS located and pegged with a steel dropper. The site is inspected and photographed prior to any disturbance. A drill pad is then cleared, keeping disturbance to the native vegetation to an absolute minimum. Any topsoil removed is stored separately for later reuse.
- Plastic lining to prevent oil spillage is used under the rig. The area is cordoned off and, if required, firebreaks are established. After the drilling operation is complete, each borehole collar is surveyed and the site is rehabilitated and photographed. The retained topsoil is used to fill any sumps. Any spoils or drilling material is transported off site and disposed of in an approved area.

#### **6.6.3 Description of the storage facilities available for the above fluids:**

None of the above mentioned fluids will be stored on site due to the close proximity of the town and will be transported to the site on a daily basis or as needed.

### **C.6.7 Summary of significant impacts on environment (Regulation 52(2)(c))**

#### Geology

<b>Significance/Magnitude</b>	<b>Duration</b>	<b>Probability</b>	<b>Timing</b>
Low to medium	Permanent	Certain	Activity

Drilling (6.5 inch bit) will have no effect on the geology. The prospecting pits planned will have an impact on the geology, but this will be minimal as the area is small. Prospecting pits/trenches will also disturb the geologic sequence of sediment on a small scale.

Topography

<b>Significance/Magnitude</b>	<b>Duration</b>	<b>Probability</b>	<b>Timing</b>
Low to medium	Transient	Certain	Activity

Percussion drilling will have a very low to no impact on the topography. The prospecting pits will have a medium impact on the topography. The pits will be backfilled. The proximity of the prospecting pits to the previous mining activities minimises the impact on topography as the overburden of the new excavations can be placed in the old excavations

Soils

<b>Significance/Magnitude</b>	<b>Duration</b>	<b>Probability</b>	<b>Timing</b>
Low	Life of mine	Certain	Activity

The pits require topsoil to be removed and stockpiled. Such topsoil will be replaced over the affected area once backfilled with the overburden.

Land capability

<b>Significance/Magnitude</b>	<b>Duration</b>	<b>Probability</b>	<b>Timing</b>
Low	Transient	Certain	Activity

Drilling is transient, and will not affect the land capability. The prospecting pits are extensions of previous mining excavations and prospecting areas, and very little fresh ground will be disturbed.

Land use

<b>Significance/Magnitude</b>	<b>Duration</b>	<b>Probability</b>	<b>Timing</b>
Low	Transient	Certain	Activity

Drilling is transient, and will not affect the land capability/ land use. The prospecting pits are small and very little virgin areas will be disturbed.

Natural vegetation / Plant life

<b>Significance/Magnitude</b>	<b>Duration</b>	<b>Probability</b>	<b>Timing</b>
Low	Transient	Certain	Activity

Driving the drill rig onto site will disturb plant life. As far as possible, existing roads would be used to access drill sites. As described above the area to be disturbed by pits and trenches is small, and the veld regenerates well if red Kalahari sand is placed over areas worked. The effect on plant life would therefore be low and transient.

Animal Life

<b>Significance/Magnitude</b>	<b>Duration</b>	<b>Probability</b>	<b>Timing</b>
Low	Transient	Certain	Activity

Driving the drill rig onto site will disturb animal life: they will be chased from their present site. As far as possible, existing roads would be used to access drill sites. As described above the area to be disturbed by pits and trenches is small, and the veld regenerates well if red Kalahari sand is placed over areas worked. The effect on animal life would therefore be low and transient.

Surface water

<b>Significance/Magnitude</b>	<b>Duration</b>	<b>Probability</b>	<b>Timing</b>
Negligible	Transient	Unlikely	Activity

The effect of drilling and trenching is considered minimal.



Ground water

<b>Significance/Magnitude</b>	<b>Duration</b>	<b>Probability</b>	<b>Timing</b>
Negligible	Point	Unlikely	Activity

The effect of drilling and trenching is considered minimal. Repairs and maintenance of equipment will take place at service stations in town.

Air Quality

<b>Significance/Magnitude</b>	<b>Duration</b>	<b>Probability</b>	<b>Timing</b>
Low	Transient	Certain	Activity

The effect of drilling and trenching is considered minimal due to the small scale of the operations.

Noise

<b>Significance/Magnitude</b>	<b>Duration</b>	<b>Probability</b>	<b>Timing</b>
Low	Transient	Certain	Activity

The noise generated by drilling and trenching is considered minimal due to the short time frame, the small scale of the operations and the isolation of the site.

Sites of Archaeological and Cultural interest

<b>Significance/Magnitude</b>	<b>Duration</b>	<b>Probability</b>	<b>Timing</b>
Zero impact	Zero impact	Zero impact	Zero impact

The drilling is transient and only affects a very small area, and the prospecting pits are a continuation of the previous mining and prospecting areas. We therefore do not suspect that any archaeological sites will be disturbed also refer C5 above.

Sensitive landscapes

<b>Significance/Magnitude</b>	<b>Duration</b>	<b>Probability</b>	<b>Timing</b>
Zero impact	Zero impact	Zero impact	Zero impact

There will be no impact on sensitive landscapes as the pits and trenches are located in the proximity of previous, un-rehabilitated workings.

Visual aspects

<b>Significance/Magnitude</b>	<b>Duration</b>	<b>Probability</b>	<b>Timing</b>
Zero impact	Zero impact	Zero impact	Zero impact

The prospecting sites are not readily visible from the main road or town.

Regional socio-economic structure

<b>Significance/Magnitude</b>	<b>Duration</b>	<b>Probability</b>	<b>Timing</b>
Highly Beneficial	Life of mine	Certain	Activity

Although prospecting is usually conducted using experienced personnel, a successful prospecting program would potentially increase the life of the mine, and thereby increase the term of employment of the local community, as described in the preceding paragraphs.

**C.6.8 Mitigation or managed of the negative impacts (Regulation 57(2)(c))**Domestic Waste Management Programmes

The owner will instruct the employees in the need for procedure/tasks as well as the actual handling of domestic waste, relating to domestic waste management.

Domestic waste (lunch wrappers, containers, food tins, bottles) of daily workers as

well as the domestic waste from the mining logistics will be provided for and handled as follows:

- Provide waste collection drums at strategic points (workshops/personnel amenity area, residential and recreational facilities).
- Demarcate an area for and constructed as "temporary waste storage area" for temporary collection and storage of the drums, prior to delivery to Port Nolloth disposal site for disposal. (On-site dumping/burial is not allowed without registration/licensing of such a site with the Department of Water Affairs and Forestry in terms of the Environment Conservation Act).
- Instruct staff on the distinction between domestic refuse and industrial waste.

#### Industrial Waste Management

No industrial waste will be generated as all repairs will be done at the service stations in town.

#### Diesel and Lubricant Handling Programme:

Due to the close proximity of the town no fuel or lubricants will be stored on site and will be transported as needed.

#### Geology

No attenuation measures proposed.

#### Topography

Although the perimeter of the drill bit is not large, the top of the drill holes will be backfilled as far as possible with the material extracted while drilling. This will ensure a natural capping of the drill hole, and the safety of the site after prospecting ceases.

In the case of prospecting pits, the pits are to be limited to 20m x 20m and backfilled after logging of results. The creation of overburden dumps on natural ground level will not take place.

#### Soils

Bore hole sites are GPS located and pegged with a steel dropper. The site is inspected and photographed prior to any disturbance. A drill pad is then cleared, keeping disturbance to the native vegetation to an absolute minimum. Any topsoil removed is stored separately for later reuse. Plastic lining to prevent oil spillage is used under the rig. The area is cordoned off and, if required, firebreaks are established. After the drilling operation is complete, each borehole collar is surveyed and the site is rehabilitated and photographed. The retained topsoil is used to fill any sumps. Any spoils or drilling material is transported off site and disposed of in an approved area.

The upper soil horizons ("topsoil") from the prospecting trenches will be handled as a cut-and-backfill strip mining method. This means that the stockpiles will be temporary and topsoil will be replaced on the backfilled excavation as part of the on-going rehabilitation process.

#### Land capability

Stockpiled topsoil will be replaced on the backfilled excavations of the trenches as part of the on-going rehabilitation process to promote natural re-vegetation, thereby restoring the land to its former use: grazing.

### Land use

Stockpiled topsoil will be placed on the backfilled excavations intermittently as part of the on-going rehabilitation process to promote natural re-vegetation, thereby restoring the land to its former use: grazing.

### Natural vegetation /Plant life

The following general aspects must be implemented to reduce any potential impact:

- Movement areas must be clearly demarcated and any movement outside of these areas must not be allowed
- No ad hoc roads, dumping or topsoil borrowing

Observations over the past 3 years at Buffels Bank have revealed that:

- Red aeolian topsoil, if placed on rehabilitated surfaces, no matter how thin (suggested min 25mm) promotes pioneer re-vegetation by Bushman's grass during the first season
- followed by Mesembryanthemums by year 3
- Topsoil if directly re-used has immediate re-vegetation results given the seedbank present in the topsoil.
- un-topsoiled subsoil, dumps or disturbed areas do not re-vegetate

As such, topsoil management and re-vegetation programmes rely on:

- Minimum disturbance
- Re-top soiling with red soil
- Direct re-use of removed topsoil on a strip mining basis
- Top soiling to min of 10cm to promote basic growth

Note that in respect of topsoil (upper 100mm horizon) offers the advantage of bearing the seed bank and the broken Mesembryanthemums (after dozing), which will re-root. Observations are that the lower topsoil horizon (100mm to up to 0.5m in depth) still achieve the desired results in the re-vegetation programme. It merely takes a while longer i.e. no significant growth in the first year.

Stockpiled topsoil will be placed on the backfilled excavation intermittently (to min 10cm depth) as part of the on-going rehabilitation process to promote natural re-vegetation, thereby restoring the land to its former state. Note that all vegetation will be dozed along with topsoil into berms above the disturbed area. The topsoil berms will not exceed 2m in height in order to retain the seed bank.

### Animal life

Stockpiled topsoil will be placed on the backfilled excavation intermittently as part of the on-going rehabilitation process to promote natural re-vegetation, thereby restoring animal habitats temporarily lost.

The presence and activity of the heavy earth moving equipment will "chase" the animals to the vast expanse of similar habitat surrounding the affected area. During prospecting activities all staff must be educated about the role of wildlife in ecology and the tourism economy and warned against poaching. Management should conduct field inspections of the surrounding area of the mine for snares.

### Surface water and Ground-water

The following measures must be implemented immediately to avoid contamination of surface and ground water:

- construct domestic and industrial temporary storage facility with pollution control measures.
- construct waste collection points and remove all solid waste from site and dispose of at municipal waste site on a weekly basis (do not bury or burn on site)
- maximize recycling of process water

Should these attenuation measures be implemented, the effect on surface water and groundwater will be minimal.

All topsoil which is removed prior to any activity will be stockpiled in berms (no higher than 2m) along with its resident seed bank and vegetation cover to an area above the proposed development. This berm will then serve a storm water control function in the unlikely event of surface water run-off.

### Air quality

While existing dust generation has no noteworthy environmental impact on surround areas, dust should be controlled in the interest of improved worker health and safety.

In this instance periodic wetting of the manoeuvring areas or even an annual application of a dust palliative can be considered. (No used oil or diesel is to be sprayed on the roadway for dust suppression).

### Noise

Despite noise having no impact on other uses / public given the isolation of the site, continue to pursue methods of mining which reduce noise in the interest of worker health and safety.

### Sites of Archaeological and Cultural interest

No attenuation measures necessary.

### Sensitive landscapes

No attenuation measures necessary.

### Visual aspects

Pits will be backfilled as soon as possible. Dumps will therefore only be temporary, and therefore have a short-lived visual impact. Topsoil will then be draped over the exploration sites, with the associated benefits.

### Regional socio-economic structure

The majority of the labour force will be drawn from the local communities (Port Nolloth). This will increase the skills base in the vicinity, increase spending power and stimulate supporting industries.

### C.7 Financial provision: (Regulation 54)

The amount that is necessary for the rehabilitation of damage caused by the operation, both sudden closure during the normal operation of the project and at final, planned closure will be estimated by the regional office of the DME, based on the information supplied in this document. This amount will reflect how much will it cost the Department to rehabilitate the area disturbed in case of liquidation or abscondence. The rehabilitation funds will be updated on an annual basis and the rehabilitation funds topped up accordingly.

Amount of financial provision required : R 30 000.00
--

Method to furnish DME with this financial provision?

Cash deposit	
Bank guarantee	X
Trust Fund	
Other: (specify) (Note: other methods must be approved by the Minister)	

### C.8 Monitoring and performance assessment.

Regulation 55 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) clearly describes the process and procedure as well as requirements for monitoring and auditing of the performance of this plan to adequately address environmental impacts from the operation.

#### C.8.1 Description of how the adequacy of this programme will be assessed and how any inadequacies will be addressed. (Regulations 55(1) and 52(2)(e))

The applicant will, on a bi-monthly basis, check every aspect of his operation against the prescriptions given in Section F of this document and, if I find that certain aspects are not addressed or impacts on the environment are not mitigated properly, he will rectify the identified inadequacies immediately. Regular monitoring of all the environmental management measures and components shall be carried out to ensure that the provisions of this program are adhered to.

Inspections and monitoring shall be carried out on both the implementation of the program and the impact on the environment. Visual inspections on erosion and physical pollution shall be carried out on a regular basis.

Layout plans will be updated on a regular basis and updated copies will be submitted on a annual basis to the Regional Manager.

The plans will also be updated before commencing with invasive prospecting and the rehab. estimate will also be updated.

Reports confirming compliance with various points identified in the environmental management program will be submitted to the Regional Manager on a annual basis together with an update of the rehabilitation cost. Any emergency or unforeseen impact will be reported as soon as possible. An assessment of environmental impacts that were not properly addressed or were unknown when the program was compiled shall be carried out and added as a corrective action.

**C.9 Closure and Environmental objectives: (Regulation 52(2)(f))**

**C.9.1 Intended end use for the area prospected after closing of operations.**

The environment affected by the prospecting operations shall be rehabilitated, as far as is practicable, to its natural state. Land use will be the same as before prospecting with the same production with regard to small stock farming. The affected environment shall be 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.

**C.9.2 Description of what the environment will look like after a closure certificate has been obtained.**

**Closure objectives**

The closure objective 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 to ensure that the rehabilitation measures prove successful. The aim is to ensure a stable environment to allow sustainable vegetation re-growth. To facilitate this, the following is required:

Effective shaping of the final faces and backfilled overburden dumps with erosion control facilities above all edges.

Provision of efficient storm water control to prevent erosion of steep slopes and roadways and elsewhere where required

Scarifying of all internal access roads

Covering excavation areas, maneuvering areas and roads with top soil and allowing these areas to re-vegetate naturally

The goal of rehabilitation with respect to the area where prospecting will take place is to leave the area level and even, and in a natural state containing no foreign debris or other materials.

All scrap and other foreign materials will be removed from the area and disposed of as in the case of other refuse, whether these accrue directly from the mining operation or are brought on to the site.

Removal of these materials shall be done on a continuous basis and not only at the start of rehabilitation.

The small amount of overburden from the trenches will be back filled into the excavation and covered with topsoil. The area will be profiled to blend in with the topography of the surrounding environment.

The proposed end-state of the area was consulted with interested and affected parties in terms of Regulation 52(2)(g) (App. 4).

**C 10 CLOSURE**

Regulations 56 to 62 outline the entire process of mine closure, and these are copied in Section F of this document, both as a guide to applicants on the process to be followed for mine closure, and also to address the legal responsibility of the applicant with regard to the proper closure of his operation. In terms of Section 37 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002), the holder of a permit is liable for any and all environmental damage or degradation emanating from his operation, until a closure certificate is issued in terms of Section 43 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002).

**C.11 Public Participation: (Regulation 52(2)(g))**

In terms of the above regulation consultation with interested and affected person or persons must take place prior to the approval of the environmental management plan. This regulation is quoted below for ease of reference.

- C 11.1** Any comments lodged by an interested and affected person or persons in terms of section 10(1)(b) of the Act, must be in writing and addressed to the relevant Regional Manager.
- C 11.2** Any objections lodged by an interested and affected person or persons against the application for a right or permit in terms of the Act, must set out clearly and concisely the facts upon which it is based and must be addressed to the relevant Regional Manager in writing.
- C 11.3** The Regional Manager must make known by way of publication in a local newspaper or at the office of the Regional Manager, that an application for a right or permit in terms of the Act has been received.

The list of people or organisations likely to be influenced by the proposed prospecting operation and the means by which consultation have taken place are listed in appendix 4.

**D SCORING OF EIA**

**D 1.1 CALCULATION TABLE**

Section <b>C 1</b> Total	+	Section <b>C 2</b> Total	+	Section <b>C 4</b> Total	+	Section <b>C 5</b> Total	=	<i>Subtotal</i>	X	Time Factor Section <b>C 3</b>	=	Score (Impact rating)
	+		+		+		=		X		=	

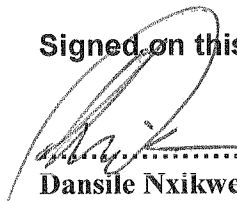
**D 1.2 IMPACT RATING SCALE**

SCORE ATTAINED	IMPACT RATING	REMARKS
46 – 300	Low	No additional objectives needed – this program is sufficient
301 - 800	Medium	Some specific additional objectives to address focal areas of concern may be set.

**E UNDERTAKING:**

I Dansile Nxikwe as representative of **Dansile Nxikwe Diamonds CC** the applicant for a prospecting right hereby declare that the above information is true, complete and correct according to the original approved EMPR and undertake to implement the measures as described in Sections F and G hereof. I understand that this undertaking is legally binding and that failure to give effect hereto will render them liable for prosecution in terms of Section 98 (b) and 99 (1)(g) of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002). They are also aware that the Regional Manager may, at any time but after consultation with me, make such changes to this plan as he may deem necessary.

**Signed on this 23<sup>rd</sup> day of October 2010 at Springbok**

  
 .....  
**Dansile Nxikwe**  
**Dansile Nxikwe Diamonds CC**

## **F. ENVIRONMENTAL MANAGEMENT PLAN: INTRODUCTION**

This Environmental Management Plan contains guidelines, operating procedures and rehabilitation/pollution control requirements which will be binding on the holder of the Prospecting permit after approval of the Environmental Management Plan. It is essential that this portion be carefully studied, understood, implemented and adhered to at all times.

### **F 1 GENERAL REQUIREMENTS**

#### **F 1.1 MAPPING AND SETTING OUT**

##### **F 1.1.1 LAYOUT PLAN**

- A copy of the layout plan as provided for in Regulation 2.2 must be available at the prospecting site for scrutiny when required.
- The plan must be updated on a regular basis with regard to the actual progress of the establishment of surface infrastructure, prospecting operations and rehabilitation (a copy of the updated plan shall be forwarded to the Regional Manager on a regular basis).
- A final layout plan must be submitted at closure of the mine or when operations have ceased.

**NOTE:** Regulation 2.2 of the regulations promulgated in terms of the Act requires:

*"An application contemplated in sub-regulation (1) must be accompanied by a plan that must contain –*

- (a) *the co-ordinates of the land or area applied for;*
- (b) *the north point;*
- (c) *the scale to which the plan has been drawn;*
- (d) *the name, number and location of the land or area covered by the application; and*
- (e) *in relation to farm boundaries and surveyed points-*
  - (i) *the size and shape of the proposed area;*
  - (ii) *the boundaries of the land or area comprising the subject of the application concerned;*
  - (iii) *the layout of the proposed prospecting, exploration or production operations;*
  - (iv) *surface structures and servitude's;*
  - (v) *the topography of the land or area; "*

##### **F 1.1.2 DEMARCATING THE PROSPECTING AREA**

- The prospecting area must be clearly demarcated by means of beacons at its corners, and along its boundaries if there is no visibility between the corner beacons.
- Permanent beacons as indicated on the layout plan or as prescribed by the Regional Manager must be firmly erected and maintained in their correct position throughout the life of the operation.
- Prospecting and resultant operations shall only take place within this demarcated area.

##### **F 1.1.3 DEMARCATING THE RIVER CHANNEL AND RIVERINE ENVIRONMENT**

**The following is applicable if operations are conducted within the riverine environment (See F 3.2):**

- Beacons as indicated on the layout plan or as prescribed by the Regional Manager must be erected and maintained in their correct position throughout the life of the operation.



- These beacons must be of a permanent nature during the operations and must not be easily removable, especially those in a river channel. The beacons must, however, be removed at the end of the operations.
- The mining of and prospecting for any mineral shall only take place within this demarcated prospecting area.
- If riverine vegetation is present in the form of reeds or wetland vegetation, the presence of these areas must be entered in Part C 1.45 of the EMPlan and indicated on the layout plan.
- The holder of the prospecting permit will also be required to permanently demarcate the areas as specified in F 1.2.

### F 1.2 RESTRICTIONS ON PROSPECTING

- On assessment of the application, the Regional Manager may prohibit the conducting of mining or prospecting operations in vegetated areas or over portions of these areas
- In the case of areas that are excluded from mining or prospecting, no operations shall be conducted within 5 m of these areas.

### F 1.3 RESPONSIBILITY

- The environment affected by the prospecting operations shall be rehabilitated by the holder, as far as is practicable, to its natural state or to a predetermined and agreed to standard or land use which conforms with the concept of sustainable development. The affected environment shall be 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.
- It is the responsibility of the holder of the prospecting right to ensure that the manager on the site and the employees are capable of complying with all the statutory requirements which must be met in order to mine, which includes the implementation of this EMP.
- **If operations are to be conducted in an area that has already been disturbed, the holder must reach specific agreement with the Regional Manager concerning the responsibilities imposed upon himself pertaining to the rehabilitation of the area and the pollution control measures to be implemented.**

## F 2 INFRASTRUCTURAL REQUIREMENTS

### F 2.1 TOPSOIL

- Topsoil shall be removed from all areas where physical disturbance of the surface will occur.
- All available topsoil shall be removed after consultation with the Regional Manager prior to the commencement of any operations.

- The topsoil removed, shall be stored in a bund wall on the high ground side of the prospecting area outside the 1:50 flood level within the boundaries of the prospecting area.
- Topsoil shall be kept separate from overburden and shall not be used for building or maintenance of access roads.
- The topsoil stored in the bund wall shall be adequately protected from being blown away or being eroded.

## F 2.2 ACCESS TO THE SITE

### F 2.2.1 Establishing access roads on the site

- The access road to the prospecting area and the camp-site/site office must be established in consultation with the landowner and existing roads shall be used as far as practicable.
- Should a portion of the access road be newly constructed the following must be adhered to:
  - The route shall be selected that a minimum number of bushes or trees are felled and existing fence lines shall be followed as far as possible.
  - Water courses and steep gradients shall be avoided as far as is practicable.
  - Adequate drainage and erosion protection in the form of cut-off berms or trenches shall be provided where necessary.
- If imported material is used in the construction or upgrading of the access road this must be listed in C 2.17
- The erection of gates in fence lines and the open or closed status of gates in new and existing positions shall be clarified in consultation with the landowner and maintained throughout the operational period.
- No other routes will be used by vehicles or personnel for the purpose of gaining access to the site.

**NOTE: The design, construction and location of access to provincial roads must be in accordance with the requirements laid down by the Provincial or controlling authority.**

### F 2.2.2 Maintenance of access roads

- In the case of dual or multiple use of access roads by other users, arrangements for multiple responsibility must be made with the other users. If not, the maintenance of access roads will be the responsibility of the holder of the prospecting permit.
- Newly constructed access roads shall be adequately maintained so as to minimise dust, erosion or undue surface damage.

### F 2.2.3 Dust control on the access and haul roads

- The liberation of dust into the surrounding environment shall be effectively controlled by the use of, inter alia, water spraying and/or other dust-allaying agents. The speed of haul trucks and other vehicles must be strictly controlled to avoid dangerous conditions, excessive dust or excessive deterioration of the road being used.

#### **F 2.2.4 Rehabilitation of access roads**

- Whenever a prospecting permit is suspended, cancelled or abandoned or if it lapses and the holder does not wish to renew the permit or right, any access road or portions thereof, constructed by the holder and which will no longer be required by the landowner, shall be removed and rehabilitated to the satisfaction of the Regional Manager.
- Any gate or fence erected by the holder which is not required by the landowner, shall be removed and the situation restored to the pre prospecting situation.
- Roads shall be ripped or ploughed, and if necessary, appropriately fertilised (based on a soil analysis) to ensure the regrowth of vegetation. Imported road construction materials which may hamper regrowth of vegetation must be removed and disposed of in an approved manner prior to rehabilitation.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analysed and any deleterious effects on the soil arising from the mining/prospecting operation, be corrected and the area be seeded with a seed mix to the Regional Manager's specification.

#### **F 2.3 OFFICE/CAMP SITES**

##### **F 2.3.1 Establishing office / camp sites**

- Office and camp sites shall be established, as far as is practicable, outside the flood plain, above the 1 in 50 flood level mark within the boundaries of the prospecting area.
- The area chosen for these purposes shall be the minimum reasonably required and which will involve the least disturbance to vegetation. Topsoil shall be handled as described in F 2.1 above
- No camp or office site shall be located closer than 100 meters from a stream, river, spring, dam or pan.
- No trees or shrubs will be felled or damaged for the purpose of obtaining firewood, unless agreed to by the landowner/tenant.
- Fires will only be allowed in facilities or equipment specially constructed for this purpose. If required by applicable legislation, a fire-break shall be cleared around the perimeter of the camp and office sites.
- Lighting and noise disturbance or any other form of disturbance that may have an effect on the landowner/tenant/persons lawfully living in the vicinity shall be kept to a minimum.

##### **F 2.3.2 Toilet facilities, waste water and refuse disposal**

- As a minimum requirement, the holder of a prospecting permit shall, at least, provide pit latrines for employees and proper hygiene measures shall be established.

- Chemical toilet facilities or other approved toilet facilities such as a septic drain shall preferably be used and sited on the camp site in such a way that they do not cause water or other pollution.
- The use of existing facilities must take place in consultation with the landowner/tenant.
- In cases where facilities are linked to existing sewerage structures, all necessary regulatory requirements concerning construction and maintenance should be adhered to.
- All effluent water from the camp washing facility shall be disposed of in a properly constructed French drain, situated as far as possible, but not less than 200 meters, from any stream, river, pan, dam or borehole.
- Only domestic type wash water shall be allowed to enter this drain and any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognised facility.
- Spills should be cleaned up immediately to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and by disposing of them at a recognised facility.
- Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., shall be stored in a container at a collecting point and collected on a regular basis and disposed of at a recognised disposal facility. Specific precautions shall be taken to prevent refuse from being dumped on or in the vicinity of the camp site.
- Biodegradable refuse generated from the office/camp site, processing areas vehicle yard, storage area or any other area shall either be handled as indicated above or be buried in a pit excavated for that purpose and covered with layers of soil, incorporating a final 0,5 meter thick layer of topsoil (where practicable). Provision should be made for future subsidence of the covering.

### **F 2.3.3 Rehabilitation of the office/camp site**

- On completion of operations, all buildings, structures or objects on the camp/office site shall be dealt with in accordance with section 44 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002), which states:
  - (1) *When a prospecting right, mining right, retention permit or mining permit lapses, is cancelled or is abandoned or when any prospecting or mining operation comes to an end, the holder of any such right or permit may not demolish or remove any building, structure, object -*
    - (a) *which may not be demolished in terms of any other law;*
    - (b) *which has been identified in writing by the Minister for purposes of this section; or*
    - (c) *which is to be retained in terms of an agreement between the holder and the owner or occupier of the land, which agreement has been approved by the Minister in writing.*
  - (2) *The provision of subsection (1) does not apply to bona fide mining equipment which may be removed*

- Where office/camp sites have been rendered devoid of vegetation/grass or where soils have been compacted owing to traffic, the surface shall be scarified or ripped.
- Areas containing French drains shall be compacted and covered with a final layer of topsoil to a height of 10cm above the surrounding ground surface.
- The site shall be seeded with a vegetation seed mix adapted to reflect the local indigenous flora.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analysed and any deleterious effects on the soil arising from the mining/prospecting operation be corrected and the area be seeded with a vegetation seed mix to his or her specification.
- Photographs of the camp and office sites, before and during the mining/prospecting operation and after rehabilitation, shall be taken at selected fixed points and kept on record for the information of the Regional Manager.

## **F 2.4 VEHICLE MAINTENANCE YARD AND SECURED STORAGE AREAS**

### **F 2.4.1 Establishing the vehicle maintenance yard and secured storage areas**

- The vehicle maintenance yard and secured storage area will be established as far as is practicable, outside the flood plain, above the 1 in 50 flood level mark within the boundaries of the prospecting area.
- The area chosen for these purposes shall be the minimum reasonably required and involve the least disturbance to tree and plant life. Topsoil shall be handled as described in F 2.1 above.
- The storage area shall be securely fenced and all hazardous substances and stocks such as diesel, oils, detergents, etc., shall be stored therein. Drip pans, a thin concrete slab or a facility with PVC lining, shall be installed in such storage areas with a view to prevent soil and water pollution.
- The location of both the vehicle maintenance yard and the storage areas are to be indicated on the layout plan.
- No vehicle may be extensively repaired in any place other than in the maintenance yard.

### **F 2.4.2 Maintenance of vehicles and equipment**

- The maintenance of vehicles and equipment used for any purpose during the prospecting operation will take place only in the maintenance yard area.
- Equipment used in the prospecting process must be adequately maintained so that during operations it does not spill oil, diesel, fuel, or hydraulic fluid.
- Machinery or equipment used on the prospecting area must not constitute a pollution hazard in respect of the above substances. The Regional Manager shall order such equipment to be repaired or withdrawn from use if he or she considers the equipment or machinery to be polluting and irreparable.

### **F 2.4.3 Waste disposal**

- Suitable covered receptacles shall be available at all times and conveniently placed for the disposal of waste.
- All used oils, grease or hydraulic fluids shall be placed therein and these receptacles will be removed from the site on a regular basis for disposal at a registered or licensed disposal facility.
- All spills should be cleaned up immediately to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and by disposing of them at a recognised facility.

### **F 2.4.4 Rehabilitation of vehicle maintenance yard and secured storage's areas**

- On completion of prospecting operations, the above areas shall be cleared of any contaminated soil, which must be dumped as referred to in section F 2.4.3 above.
- All buildings, structures or objects on the vehicle maintenance yard and secured storage areas shall be dealt with in accordance with section 44 of the Mineral and Petroleum Resources Development Act, 2002.
- The surface shall then be ripped or ploughed to a depth of at least 300mm and the topsoil previously stored adjacent the site, shall be spread evenly to its original depth over the whole area. The area shall then be fertilised if necessary (based on a soil analysis).
- The site shall be seeded with a vegetation seed mix adapted to reflect the local indigenous flora.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analysed and any deleterious effects on the soil arising from the mining/prospecting operation be corrected and the area be seeded with a seed mix to his or her specification.

## **F 3 OPERATING PROCEDURES IN THE PROSPECTING AREA**

### **F 3.1 Limitations on prospecting**

- The prospecting for precious stones shall take place only within the approved demarcated prospecting or mining area.
- Prospecting may be limited to the areas indicated by the Regional Manager on assessment of the application.
- The holder of the prospecting permit shall ensure that operations take place only in the demarcated areas as described in section F 1.1.2 above.
- Operations will not be conducted closer than one and a half times the height of the bank from the edge of the river channel and in such manner that the stability of the bank of the river is effected.
- Precautions shall also be taken to ensure that the bank of the river is adequately protected from scouring or erosion. Damage to the bank of the river caused by the operations, shall be rehabilitated to a condition acceptable to the Regional Manager at the expense of the holder.

- Restrictions on the disturbance of riverine vegetation in the form of reeds or wetland vegetation must be adhered to. The presence of these areas must be entered in Part of the programme and indicated on the layout plan.

### F 3.2 Prospecting operations within the riverine environment

**NOTE: The Department of Water Affairs and Forestry may impose additional conditions which must be attached to this EMP. In this regard, please see the Best Practice Guideline for small scale mining developed by DWAF (BPG 2.1)**

(available from <http://www.dwaf.gov.za>)

- The mining of or prospecting for precious stones in the river or the banks of the river will be undertaken only after the Regional Manager has consulted with the Department of Water Affairs and Forestry.
- The canalisation of a river will not be undertaken unless the necessary permission has been obtained from the Department of Water Affairs and Forestry. Over and above the conditions imposed by the said Department, which conditions shall form part of this EMPlan, the following will also apply:
  - ❖ The canalisation of the flow of the river over different parts of the river bed shall be constructed in such a manner that the following are adhered to at all times:
    - ◆ The flow of the river may not be impeded in any way and damming upstream may not occur.
    - ◆ The canalisation of the flow may not result in scouring or erosion of the river-bank.
    - ◆ Well points or extraction pumps in use by other riparian users may not be interfered with and canalisation may not impede the extraction of water at these points.
- Access to the riverbed for the purpose of conducting excavations in the river-bed, shall be through the use of only one access at a time. The location of the access to the river channel across the river-bank shall be at a point of the river-bank where the least excavation and damage to vegetation will occur and shall not be wider than is reasonably required. The position of the river access together with all planned future access points, must be indicated on the layout plan.

#### F 3.2.1 Rehabilitation of access to river-bed

- When rehabilitating the access point, the original profile of the river-bank will be re-established by backfilling the access point with the original material excavated or other suitable material.
- The topsoil shall then be returned over the whole area to its original depth and if necessary fertilised and the vegetation allowed to grow.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analysed and any deleterious effects on the soil arising from the

- mining/prospecting operation be corrected and the area be seeded with a seed mix to his or her specification.
- In the event of damage from an occurrence where high flood waters scour and erode access points in the process of rehabilitation over the river-bank or an access point currently in use, repair of such damage shall be the sole responsibility of the holder of the mining permit or prospecting right.
- Repair to the river-bank to reinstate its original profile to the satisfaction of the Regional Manager must take place immediately after such event has occurred and the river has subsided to a point where repairs can be undertaken.
- Final acceptance of rehabilitated river access points will be awarded only after the vegetation has re-established to a point where the Regional Manager is satisfied that the river-bank is stable and that the measures installed are of durable nature and able to withstand high river-flow conditions.

### F 3.2.2 Rehabilitation of prospecting area in the bed of the river

- The goal of rehabilitation with respect to the area where prospecting has taken place in the river-bed is to leave the area level and even, and in a natural state containing no foreign debris or other materials and to ensure the hydrological integrity of the river by not attenuating or diverting any of the natural flow.
- All scrap and other foreign materials will be removed from the bed of the river and disposed of as in the case of other refuse (see section F 2.3.2 above), whether these accrue directly from the prospecting operation or are washed on to the site from upstream.
- Removal of these materials shall be done on a continuous basis and not only at the start of rehabilitation.
- Where reeds or other riverine vegetation have been removed from areas, these shall be re-established systematically in the approximate areas where they occurred before prospecting.
- An effective control program for the eradication of invader species and other exotic plants, shall be instituted on a regular basis over the entire prospecting area under the control of the holder of the prospecting permit, both during prospecting and at the stage of final rehabilitation.

## 2. THE WATER USE LICENCE

The National Water Act, (Act 36 of 1998), is based on the principles of sustainability, efficiency and equity, meaning that the protection of water resources must be balanced with their development and use.

In addition to being issued with a prospecting right or mining permit a small-scale miner may also need to get a **water use licence** for the proposed water uses that will take place, except in certain cases.

*NOTE: The Department of Water Affairs and Forestry (DWAF) developed specific Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management. Copies of these guidelines can be obtained from the regional office of DME or DWAF.*

Applications for a water use licence must be made in good time, such that approval can be granted before a water use activity can begin. The appropriate licence forms for each kind of expected water use should be completed together with supporting documentation. The main



supporting document required is a technical report. To make the technical report easier, you can refer to sections in this EMPlan, as most of what the technical report requires has already been done in the EMPlan. If you refer to the EMPlan it must be attached to the technical report.

### **F 3.3 EXCAVATIONS**

#### **F 3.3.1 Establishing the excavation areas**

- Whenever any excavation is undertaken for the purpose of locating and/or extracting ore bodies of all types of minerals, including precious stone-bearing gravels, the following operating procedures shall be adhered to:
  - ❖ Topsoil shall, in all cases (except when excavations are made in the river-bed), be handled as described in F 2.1 above.
  - ❖ Excavations shall take place only within the approved demarcated prospecting area.
  - ❖ Overburden rocks and coarse material shall be placed concurrently in the excavations or stored adjacent to the excavation, if practicable, to be used as backfill material once the ore or gravel has been excavated.
  - ❖ Trenches shall be backfilled immediately if no ore or precious stone-bearing gravel can be located.

#### **F 3.3.2 Rehabilitation of excavation areas**

The following operating procedures shall be adhered to:

- The excavated area must serve as a final depositing area for the placement of tailings during processing.
- Rocks and coarse material removed from the excavation must be dumped into the excavation simultaneously with the tailings.
- Waste, as described in paragraph F 2.3.2 above, will not be permitted to be deposited in the excavations.
- Once excavations have been refilled with overburden, rocks and coarse natural materials and profiled with acceptable contours and erosion control measures, the topsoil previously stored, shall be returned to its original depth over the area.
- The area shall be fertilised if necessary to allow vegetation to establish rapidly. The site shall be seeded with a local or adapted indigenous seed mix in order to propagate the locally or regionally occurring flora.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analysed and any deleterious effects on the soil arising from the prospecting operation, be corrected and the area be seeded with a vegetation seed mix to his or her specification.

### **F 3.4 PROCESSING AREAS AND WASTE PILES (DUMPS)**

#### **F 3.4.1 Establishing processing areas and waste piles**

- Processing areas and waste piles shall not be established within 100 metres of the edge of any river channel or other water bodies.
- Processing areas should be established, as far as practicable, near the edge of excavations to allow the waste, gravel and coarse material to be processed therein.
- The areas chosen for this purpose shall be the minimum reasonably required and involve the least disturbance to vegetation.
- Prior to development of these areas, the topsoil shall be removed and stored as described in paragraph F 2.1 above.
- The location and dimensions of the areas are to be indicated on the layout plan and once established, the processing of ore containing precious stones shall be confined to these areas and no stockpiling or processing will be permitted on areas not correctly prepared.
- Tailings from the extraction process must be so treated and/or deposited that it will in no way prevent or delay the rehabilitation process.

#### **F 3.4.2 Rehabilitation of processing areas**

- Coarse natural material used for the construction of ramps must be removed and dumped into the excavations.
- On completion of prospecting operations, the surface of the processing areas especially if compacted due to hauling and dumping operations, shall be scarified to a depth of at least 300mm and graded to an even surface condition and the previously stored topsoil will be returned to its original depth over the area.
- Prior to replacing the topsoil the material that was removed from the processing area will be replaced in the same order as it originally occurred.
- The area shall then be fertilised if necessary to allow vegetation to establish rapidly. The site shall be seeded with a local, adapted indigenous seed mix.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analysed and any deleterious effects on the soil arising from the mining/prospecting operation be corrected and the area be seeded with a seed mix to his or her specification.

### **F 3.5 TAILINGS DAM(S) (SLIMES DAM)**

The permission of the Regional Manager must be obtained should a tailings dam be constructed for the purpose of handling the tailings of the prospecting operations. The construction, care and maintenance of tailings dams have been regulated and the relevant regulation is copied herewith, both for your information and as a guideline to the commissioning, management, operation, closing and aftercare of a tailings deposition facility.

**Regulation 73 promulgated under the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) requires the following:**

**Management of residue stockpiles and deposits**

56. (1) The assessment of impacts relating to the management of residue stockpiles and deposits, where appropriate, must form part of the environmental impact assessment report and environmental management programme or the environmental management plan.
- (2) Residue characterisation
- (a) Mine residue must be characterised to identify any potentially significant health and safety hazard and environmental impact that may be associated with the residue when stockpiled or deposited at the site(s) under consideration.
- (b) Residue stockpiles and deposits must be characterised in terms of its –
- (i) physical characteristics, which may include –
- (aa) the size distribution of the principal constituents;
- (bb) the permeability of the compacted material;
- (cc) void ratios of the compacted material;
- (dd) the consolidation or settling characteristics of the material under its own weight and that of any overburden;
- (ee) the strength of compacted material;
- (ff) the specific gravity of the solid constituents; and
- (gg) the water content of the material at the time of deposition, after compaction, and at other phases in the life of the deposit.
- (ii) chemical characteristics, which may include –
- (aa) the toxicity;
- (bb) the propensity to oxidize and /or decompose;
- (cc) the propensity to undergo spontaneous combustion;
- (dd) the pH and chemical composition of the water separated from the solids;
- (ee) stability and reactivity and the rate thereof; and
- (ff) neutralising potential.
- (iii) mineral content, which include the specific gravity of the residue particles and its impact on particle segregation and consolidation;
- (3) Classification of residue stockpiles and deposits
- (a) All residue stockpiles and deposits must be classified into one or a combination of the following categories –
- (i) the safety classification to differentiate between residue stockpiles and deposits of high, medium and low hazard on the basis of their potential to cause harm to life or property; and
- (ii) the environmental classification to differentiate between residue stockpiles and deposits with –
- (aa) a potentially significant impact on the environment due to its spatial extent, duration and intensity of potential impacts; or
- (bb) no potentially significant impact on the environment.
- (b) All mine residue stockpiles and deposits must be classified by a suitably qualified person(s).
- (c) The classification of residue stockpiles and deposits shall determine the –
- (i) level of investigation and assessment required;
- (ii) requirements for design, construction, operation, decommissioning, closure and post closure maintenance; and
- (iii) qualifications and expertise required of persons undertaking the investigations, assessments, design, construction thereof.
- (d) The safety classification of residue stockpiles and deposits shall be based on the following criteria –

Number of residents in zone of influence	Number of workers in zone of influence	Value of third party property in zone of influence	Depth to underground mine workings	Classification
0	< 10	0 – R2 m	> 200m	Low hazard
1 – 10	11 – 100	R 2 m – R20 m	50 m – 200 m	Medium hazard
> 10	> 100	> R20 m	< 50 m	High hazard

- (e) *A risk analysis must be carried out and documented on all high hazard residue stockpiles and deposits.*
  - (f) *The environmental classification of residue stockpiles and deposits must be undertaken on the basis of –*
    - (i) *the characteristics of the residue;*
    - (ii) *the location and dimensions of the deposit (height, surface area);*
    - (iii) *the importance and vulnerability of the environmental components that are at risk; and*
    - (iv) *the spatial extent, duration and intensity of potential impacts.*
  - (g) *An assessment of the environmental impacts shall be done on all environmental components which are significantly affected.*
  - (h) *The assessment of impacts and analyses of risks shall form part of the environmental assessment and management programme.*
- (4) *Site selection and investigation:*
- (a) *The process of investigation and selection of a site must entail –*
    - (i) *the identification of a sufficient number of possible candidate sites to ensure adequate consideration of alternative sites;*
    - (ii) *qualitative evaluation and ranking of all alternative sites;*
    - (iii) *qualitative investigation of the top ranking sites to review the ranking done in (ii);*
    - (iv) *a feasibility study to be carried out on the highest ranking site(s), involving –*
      - (aa) *a preliminary safety classification;*
      - (bb) *an environmental classification;*
      - (cc) *geotechnical investigations; and*
      - (dd) *groundwater investigations.*
  - (b) *The geotechnical investigations may include–*
    - (i) *the characterization of the soil profile over the entire area to be covered by the residue facility and associated infrastructure to define the spatial extent and depth of the different soil horizons;*
    - (ii) *the characterization of the relevant engineering properties of foundations soils and the assessment of strength and drainage characteristics.*
  - (c) *The groundwater investigations may include–*
    - (i) *the potential rate of seepage from the residue facility;*
    - (ii) *the quality of such seepage;*
    - (iii) *the geohydrological properties of the strata within the zone that could potentially be affected by the quality of seepage;*
    - (iv) *the vulnerability and existing potential use of the groundwater resource within the zone that could potentially be affected by the residue facility.*
  - (d) *From these investigations, a preferred site must be identified.*
  - (e) *Further investigation on the preferred site, shall include –*
    - (i) *land use;*
    - (ii) *topography and surface drainage;*
    - (iii) *infrastructure and man-made features;*
    - (iv) *climate;*
    - (v) *flora and fauna;*
    - (vi) *soils;*
    - (vii) *ground water morphology, flow, quality and usage; and*
    - (viii) *surface water.*
  - (f) *The investigations, laboratory test work, interpretation of data and recommendations for the identification and selection of the most appropriate and suitable site for the disposal of all residue that have the potential to generate leachate that could have a significant impact on the environment and groundwater must be carried out by a suitably qualified person.*

- (5) *Design of residue stockpile and deposit*
- (a) *The design of the residue stockpile and deposit shall be undertaken by a suitably qualified person.*
  - (b) *An assessment of the typical soil profile on the site is required for residue stockpiles and deposits which -*
    - (i) *have a low hazard potential; and*
    - (ii) *have no significant impact on the environment.*
  - (c) *The design of the residue stockpile and deposit must take into account all phases of the life cycle of the stockpile and deposit, from construction through to closure and must include -*
    - (i) *the characteristics of the mine residue;*
    - (ii) *the characteristics of the site and the receiving environment;*
    - (iii) *the general layout of the stockpile or deposit, whether it is a natural valley, ring dyke, impoundment or a combination thereof and its 3-dimensional geometry at appropriate intervals throughout the planned incremental growth of the stockpile or deposit;*
    - (iv) *the type of deposition method used; and*
    - (v) *the rate of rise of the stockpile or deposit.*
  - (d) *Other design considerations, as appropriate to the particular type of stockpile and deposit must be incorporated -*
    - (i) *the control of storm water on and around the residue stockpile or deposit by making provision for the maximum precipitation to be expected over a period of 24 hours with a frequency of once in a 100 years, in accordance with the regulations made under section 8 of the National Water Act, 1998;*
    - (ii) *the provision, throughout the system, of a freeboard of at least 0.5 m above the expected maximum water level, in accordance with regulations made under the National Water Act, 1998, to prevent overtopping;*
    - (iii) *keeping the pool away from the walls; where there are valid technical reasons for deviating from this, adequate motivation must be provided and the design must be reviewed by a qualified person as required in terms of sections 9(6) or 9(7) of the Mine Health and Safety Act, 1996;*
    - (iv) *the control of decanting of excess water under normal and storm conditions;*
      - (aa) *the retention of polluted water in terms of polluted water in terms of GN R991(9), where measures may be required to prevent water from the residue deposit from leaving the residue management system unless it meets prescribed requirements;*
      - (bb) *the design of the penstock, outfall pipe, under-drainage system and return water dams;*
      - (cc) *the height of the phreatic surface, slope angles and method of construction of the outer walls and their effects on shear stability;*
      - (dd) *the erosion of slopes by wind and water, and its control by (ee) vegetation, berms or catchment paddocks; and*
      - (ee) *the potential for pollution.*
  - (e) *A design report and operating manual shall be drawn up for all residue stockpiles and deposits which -*
    - (i) *have a medium to high hazard; and*
    - (ii) *have a potentially significant impact on the environment.*
  - (f) *Relevant information must be included in the draft environmental management program or environmental management plan.*
- (6) *Construction and operation of residue deposits:*
- (a) *The holder of any right or permit in terms of the Act, must ensure that-*
    - (i) *the residue deposits, including any surrounding catchment paddocks, is constructed and operated in accordance with the approved environmental management program or environmental management plan;*
    - (ii) *the design of the residue deposit is followed implicitly throughout the construction thereof, and that any deviations from the design be approved by the Regional Manager and the environmental manage program and environmental management plan be amended accordingly;*

- (iii) *as part of the monitoring system, measurements of all residues transported to the site and of all surplus water removed from the site are recorded;*
  - (iv) *the provision for appropriate security measures be implemented to limit unauthorized access to the site and intrusion into the residue deposit;*
  - (v) *specific action be taken in respect of any sign of pollution;*
  - (vi) *adequate measures be implemented to control dust pollution and erosion of the slopes; and*
  - (vii) *details of rehabilitation of the residue deposit be provided in the draft environmental management program or environmental management plan.*
  - (b) *A system of routine maintenance and repair in respect of the residue deposit must be implemented to ensure the ongoing control of pollution, the integrity of rehabilitation and health and safety matters at the site.*
- (7) *Monitoring of residue stockpiles and deposits:*
- (a) *A monitoring system for residue stockpiles and deposits with respect to potentially significant impacts as identified in the environmental assessment must be included in the environmental management program or environmental management plan.*
  - (b) *In the design of a monitoring system for a residue stockpile or deposit, consideration must be given to –*
    - (i) *baseline and background conditions with regard to air, surface and groundwater quality ;*
    - (ii) *the air, surface and groundwater quality objectives;*
    - (iii) *residue characteristics;*
    - (iv) *the degree and nature of residue containment;*
    - (v) *the receiving environment and specifically the climatic, local geological, hydro-geological and geo-chemical conditions;*
    - (vi) *potential migration pathways;*
    - (vii) *potential impacts of leachate;*
    - (viii) *the location of monitoring points and the prescribed monitoring protocols; and*
    - (ix) *the reporting frequency and procedures.*
- (8) *Decommissioning, closure and after care:*
- (a) *The decommissioning, closure and post closure management of residue deposits must be addressed in the closure plan, which must contain the following -*
    - (i) *the environmental classification, including assumptions on which the classification were based;*
    - (ii) *the closure objectives, final land use or capability;*
    - (iii) *conceptual description and details for closure and post closure management;*
    - (iv) *cost estimates and financial provision for closure and post-closure management; and*
    - (v) *residual impacts, monitoring and requirements to obtain mine closure in terms of the Act.*

### **F 3.6 FINAL REHABILITATION**

- All infrastructure, equipment, plant, temporary housing and other items used during the prospecting period will be removed from the site (section 44 of the MPRDA)
- Waste material of any description, including receptacles, scrap, rubble and tyres, will be removed entirely from the prospecting area and disposed of at a recognised landfill facility. It will not be permitted to be buried or burned on the site.
- Final rehabilitation shall be completed within a period specified by the Regional Manager.

## F 4 MONITORING AND REPORTING

### F 4.1 Inspections and monitoring

- Regular monitoring of all the environmental management measures and components shall be carried out by the holder of the prospecting permit in order to ensure that the provisions of this program are adhered to.
- Ongoing and regular reporting of the progress of implementation of this program will be done.
- Various points of compliance will be identified with regard to the various impacts that the operations will have on the environment.
- Inspections and monitoring shall be carried out on both the implementation of the program and the impact on plant and animal life.
- Visual inspections on erosion and physical pollution shall be carried out on a regular basis.

### **Regulation 55 promulgated in terms of the MPRDA requires the following:**

- (1) *As part of the general terms and conditions for a prospecting right, mining right or mining permit and in order to ensure compliance with the approved environmental management program or plan and to assess the continued appropriateness and adequacy of the environmental management program or plan, the holder of such right must-*
  - (a) *conduct monitoring on a continuous basis;*
  - (b) *conduct performance assessments of the environmental management program or plan as required; and*
  - (c) *compile and submit a performance assessment report to the Minister to demonstrate adherence to sub-regulation (b).*
- (2) *The frequency of performance assessment reporting shall be-*
  - (a) *in accordance with the period specified in the approved environmental management program or plan, or, if not so specified;*
  - (b) *as agreed to in writing by the Minister; or*
  - (c) *biennially (every two years).*
- (3) *The performance assessment report, shall be in the format provided in guidelines that will from time to time be published by the Department and shall as a minimum contain-*
  - (a) *information regarding the period that applies to the performance assessment;*
  - (b) *the scope of the assessment;*
  - (c) *the procedure used for the assessment;*
  - (d) *the interpreted information gained from monitoring the approved environmental management program or plan;*
  - (e) *the evaluation criteria used during the assessment;*
  - (f) *the results of the assessment; and*
  - (g) *recommendations on how and when deficiencies that are identified and/or aspects of non-compliance will be rectified.*
- (4) *The holder of a prospecting right, mining right or mining permit may appoint an independent qualified person(s) to conduct the performance assessment and compile the performance assessment report provided that no such appointment shall relieve the holder of the responsibilities in terms of these regulations.*
- (5) *Subject to section 30(2) of the Act, the performance assessment report submitted by the holder shall be made available by the Minister to any person on request.*
- (6) *If upon consideration by the Minister, the performance assessment executed by the holder is not satisfactory or the report submitted by the holder is found to be unacceptable, the holder must-*
  - (a) *repeat the whole or relevant parts of the performance assessment and revise and resubmit the report; and/or*
  - (b) *submit relevant supporting information; and/or*

- (c) *appoint an independent competent person(s) to conduct the whole or part of the performance assessment and to compile the report.*
- (7) *If a reasonable assessment indicates that the performance assessment cannot be executed satisfactorily by the holder or a competent person(s) appointed by the holder, the Minister may appoint an independent performance assessment person(s) to conduct such performance assessment. Such appointment and execution shall be for the cost of the holder.*
- (8) *When the holder of a prospecting right, mining right or mining permit intends closing such operation, a final performance assessment shall be conducted and a report submitted to the Minister to ensure that -*
- (a) *the requirements of the relevant legislation have been complied with;*
  - (b) *the closure objectives as described in the environmental management program or plan have been met; and*
  - (c) *all residual environmental impacts resulting from the holder's operations have been identified and the risks of latent impacts which may occur have been identified, quantified and arrangements for the management thereof have been assessed.*
- (9) *The final performance assessment report shall either precede or accompany the application for a closure certificate in terms of the Act.*

#### **F 4.2 Compliance reporting / submission of information**

- Layout plans will be updated on a regular basis and updated copies will be submitted on a biennial basis to the Regional Manager
- Reports confirming compliance with various points identified in the environmental management program will be submitted to the Regional Manager on a regular basis and as decided by the said manager .
- Any emergency or unforeseen impact will be reported as soon as possible.
- An assessment of environmental impacts that were not properly addressed or were unknown when the program was compiled shall be carried out and added as a corrective action.

#### **F 5 CLOSURE**

When the holder of a prospecting right, mining permit or reconnaissance permission intends closing down his/her operations, an environmental risk report shall accompany the application for closure. The requirements of such a risk report is contained in Regulation 60 of the Regulations promulgated in terms of the Act and is quoted below :

##### **F 5.1 ENVIRONMENTAL RISK REPORT**

*"An application for a closure certificate must be accompanied by an environmental risk report which must include-*

- (a) *the undertaking of a screening level environmental risk assessment where-*
  - (i) *all possible environmental risks are identified, including those which appear to be insignificant;*
  - (ii) *the process is based on the input from existing data;*
  - (iii) *the issues that are considered are qualitatively ranked as –*
    - (aa) *a potential significant risk; and/or*
    - (bb) *a uncertain risk; and/or*
  - (cc) *an insignificant risk.*
- (b) *the undertaking of a second level risk assessment on issues classified as potential significant risks where-*
  - (i) *appropriate sampling, data collection and monitoring be carried out;*
  - (ii) *more realistic assumptions and actual measurements be made; and*
  - (iii) *a more quantitative risk assessment is undertaken, again classifying issues as posing a potential significant risk or insignificant risk.*
- (c) *assessing whether issues classified as posing potential significant risks are acceptable without further mitigation;*
- (d) *issues classified as uncertain risks be re-evaluated and re-classified as either posing potential significant risks or insignificant risks;*



- (e) *documenting the status of insignificant risks and agree with interested and affected persons;*
- (f) *identifying alternative risk prevention or management strategies for potential significant risks which have been identified, quantified and qualified in the second level risk assessment;*
- (g) *agreeing on management measures to be implemented for the potential significant risks which must include-*
  - (i) *a description of the management measures to be applied;*
  - (ii) *a predicted long-term result of the applied management measures;*
  - (iii) *the residual and latent impact after successful implementation of the management measures;*
  - (iv) *time frames and schedule for the implementation of the management measures;*
  - (v) *responsibilities for implementation and long-term maintenance of the management measures;*
  - (vi) *financial provision for long-term maintenance; and*
  - (vii) *monitoring programmes to be implemented."*

## **F 5.2 CLOSURE OBJECTIVES**

Closure objectives form part of this EMPlan and must-

- (a) identify the key objectives for mine closure to guide the project design, development and management of environmental objectives;
- (b) provide broad future land use objective(s) for the site; and
- (c) provide proposed closure cost

## **F 5.3 CONTENTS OF CLOSURE PLAN**

A closure plan forms part of the EMP and must include the following:

- (a) a description of the closure objectives and how these relate to the prospecting or mine operation and its environmental and social setting;
- (b) a plan contemplated in Regulation 2(2), coordinated according to generally accepted standards, showing the land or area under closure;
- (c) a summary of the regulatory requirements and conditions for closure negotiated and documented in the environmental management program or plan;
- (d) a summary of the results of the environmental risk report and details of identified residual and latent impacts;
- (e) a summary of the results of progressive rehabilitation undertaken;
- (f) a description of the methods to decommission each prospecting or mining component and the mitigation or management strategy proposed to avoid, minimize and manage residual or latent impacts;
- (g) details of any long-term management and maintenance expected;
- (h) details of financial provision for monitoring, maintenance and post closure management, if required;
- (i) a plan or sketch at an appropriate scale describing the final land use proposal and arrangements for the site;
- (j) a record of interested and affected persons consulted; and
- (k) technical appendices, if any.

## **F 5.4 TRANSFER OF ENVIRONMENTAL LIABILITIES TO A COMPETENT PERSON**

Should the holder of a prospecting right, mining permit or reconnaissance permission wish to transfer any environmental liabilities and responsibilities to another person or persons, the following will pertain:

- (1) An application to transfer environmental liabilities to a competent person in terms of section 48) of the Act, must be completed on Form O as set out in Annexure 1 to the Regulations and be lodged to the Minister for consideration.
- (2) The holder of a prospecting right, mining right or mining permit may transfer liabilities and responsibilities as identified in the environmental management plan and the required closure plan to a competent person as contemplated in Regulation 58.
- (3) When considering the transfer of environmental liabilities and responsibilities in terms of section 48) of the Act, the Minister must consult with any State department which administers any law relating to matters affecting the environment.
- (4) No transfer of environmental liabilities and responsibilities to a competent person may be made unless the Chief Inspector of Mines and the Department of Water Affairs and Forestry have confirmed in writing that the person to whom the liabilities and responsibilities is transferred to, have the necessary qualifications pertaining to health and safety and management of potential pollution of water resources.

#### F 5.5 NOTES ON LEGAL PROVISIONS

<b>NOTE:</b>	The holder of a prospecting right, mining permit or reconnaissance permission must also take cognisance of the provisions of other legislation dealing with matters relating to conservation, and which include, <i>inter alia</i> , the following:
* National Monuments Act, 1969 (Act 28 of 1969).	
* National Parks Act, 1976 (Act 57 of 1976)	
* Environmental Conservation Act, 1989 (Act 73 of 1989)	
* National Environmental Management Act, 1998 (Act No. 107 of 1998)	
* Atmospheric Pollution Prevention Act, 1965 (Act 45 of 1965)	
* The National Water Act, 1998 (Act 36 of 1998)	
* Mine Safety and Health Act, 1996 (Act 29 of 1996)	
* The Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983).	

#### G. SPECIFIC ADDITIONAL REQUIREMENTS DETERMINED BY THE REGIONAL MANAGER.

Officials in regional offices may use the following matrix to determine the necessity for additional objectives to be included in this Section of the document:

POTENTIAL ENVIRONMENTAL IMPACTS OF PROSPECTING										
Activity	Disturbance					Pollution				Visual
	Landform	Soil	Flora	Fauna	Heritage	Land	Water	Air	Noise	
Mining										
Access										
Topsoil removal										
Overburden removal										
Mineral Extraction										
Tailings disposal										
Water Abstraction										
Pipeline route										
Transport										
Accommodation										
Waste Disposal										
Electricity										
Hydrocarbon storage										
Workforce										

Please indicate VL, L, M, H, and VH for Very Low, Low, Medium, high and Very High in each column to determine the main area and severity of impact.

G. This section outlines the specific additional requirements that may be set for the operation by the Regional Manager. Additional requirements will only have been set if the Regional Manager is of the opinion that there are specific impacts on the environment which will not be adequately mitigated by the provisions set within the standard version of the Environmental Management Plan. These requirements form part of the Environmental Management Plan and all elements and instructions contained herein must be complied with by the applicant.

**Compliance reporting will be done annually.**

**Layout plans will be updated before commencing with invasive prospecting with the position of drill traverse and trenches together with an update of the rehabilitation estimate.**

**H. UNDERTAKING**

I, **Dansile Nxikwe** as representative of **Dansile Nxikwe Diamonds CC**, have studied and understand the contents of this document in it's entirety and hereby duly undertake to adhere to the conditions as set out therein including the amendment(s) agreed to by the Regional Manager in Section G and approved on

Signed on this 23<sup>rd</sup> day of October 2010 at Springbok



.....  
**Dansile Nxikwe**  
**Dansile Nxikwe Diamonds CC**

**J. APPROVAL**

Approved in terms of Section 39(4) of the Mineral and Petroleum Resources Development Act, 2002 (Act 29 of 2002)

Signed at.....this.....day

of.....2010

.....  
**REGIONAL MANAGER**  
**REGION: Northern Cape**

This document has been compiled by the Directorate: Mine Environmental Management of the Department of Minerals and Energy at their Head Office in Pretoria. Any comments, suggestions or inputs will be sincerely appreciated. If you have any comments or suggestions regarding this document or its application, please forward your contribution to:

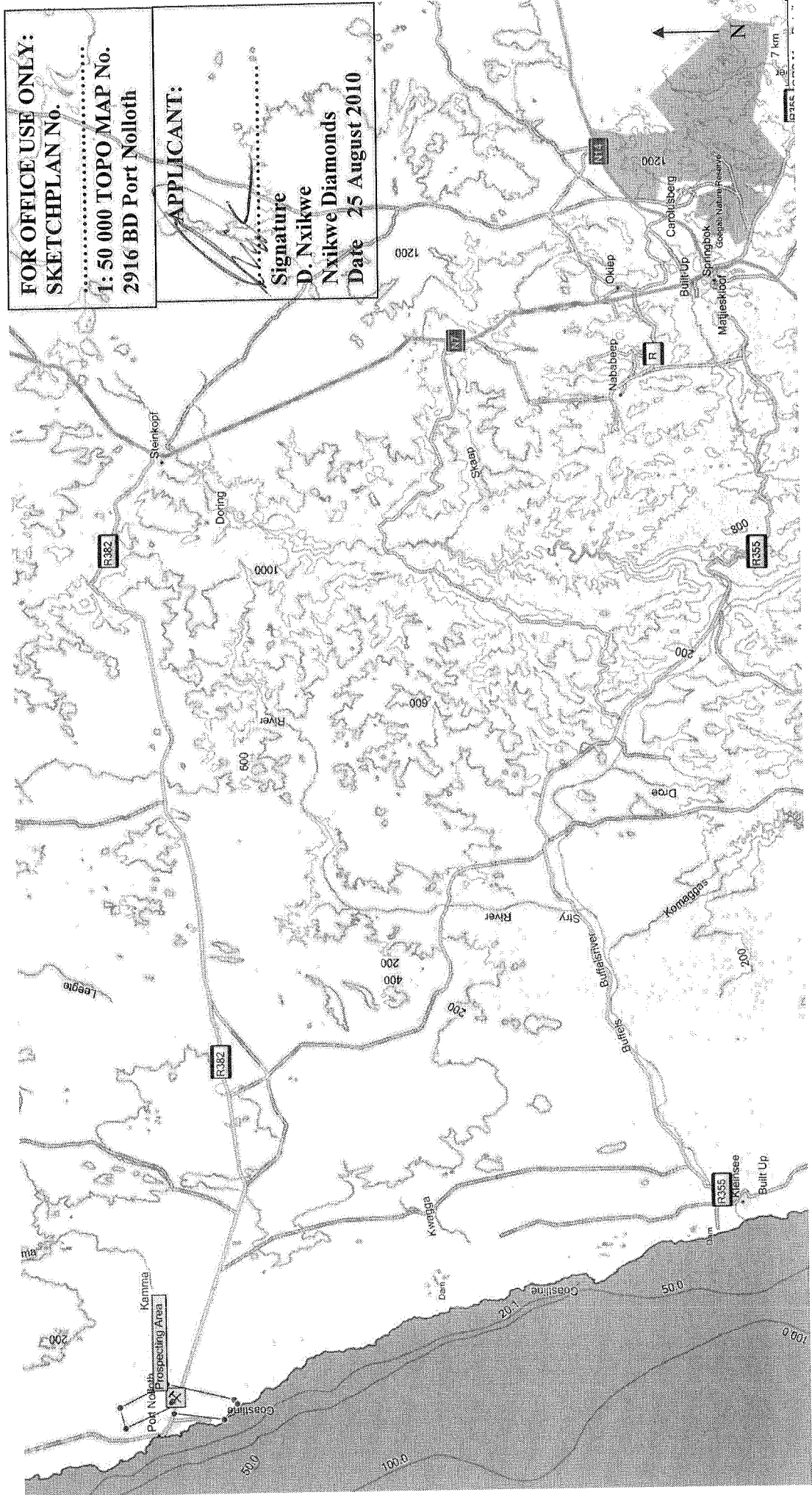
The Director: Mine Environmental Management  
 Private Bag X 59  
 PRETORIA  
 0001

Tel : 012 317 9288  
 Fax: 012 320 6786  
 E-mail: dorothy@mepta.pwv.gov.za



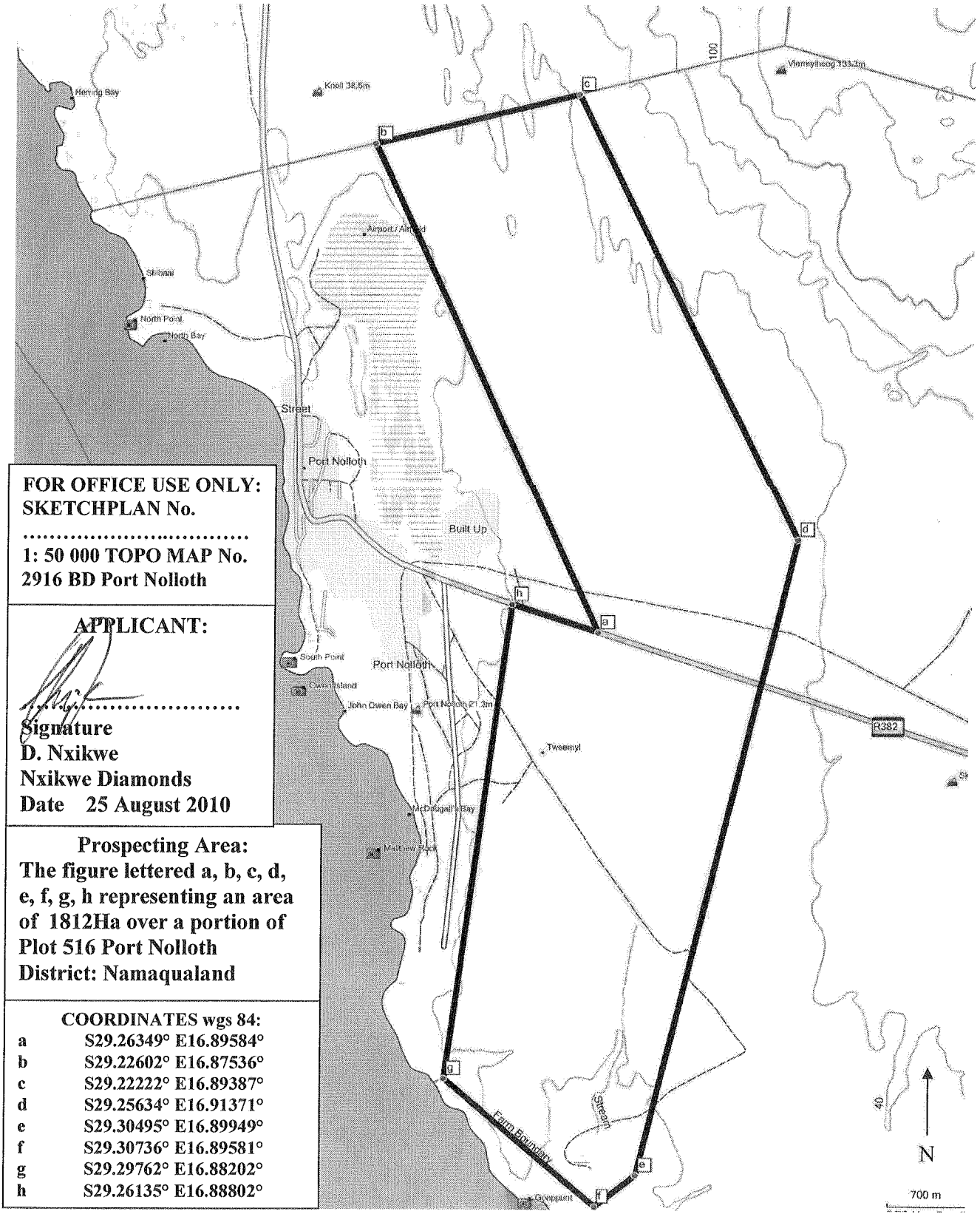
# APPENDIX 1a Locality plan

contemplated in regulation 2(2) read with regulation 2(3) of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 30 of 2002)




# APPENDIX 1b Layout plan

contemplated in regulation 2(2) read with regulation 2(3) of the Mineral and Petroleum Resources Development Act, 2002  
(Act No. 30 of 2002)



**FOR OFFICE USE ONLY:**  
**SKETCHPLAN No.**  
 .....  
**1: 50 000 TOPO MAP No.**  
**2916 BD Port Nolloth**

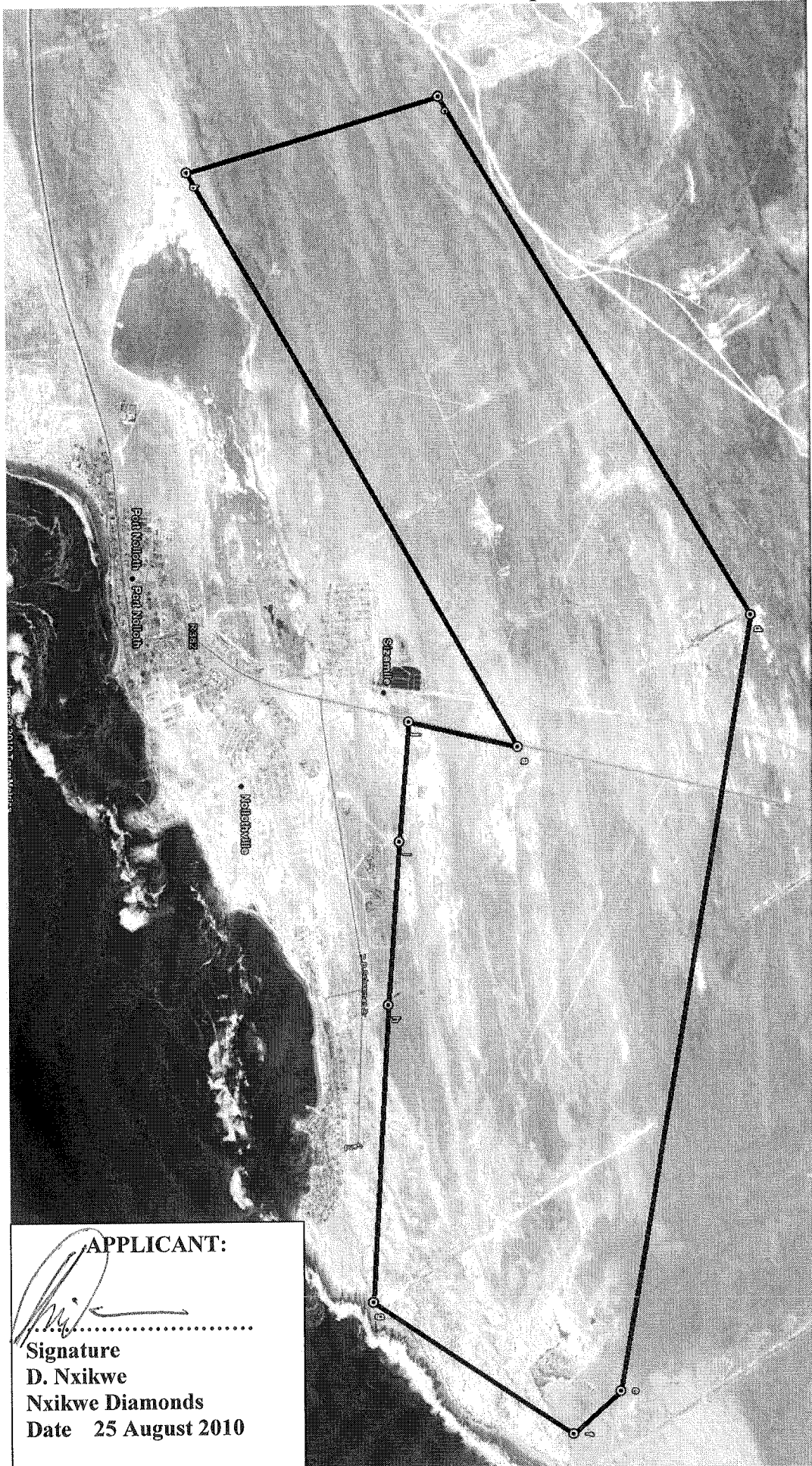
**APPLICANT:**  
  
 .....  
**Signature**  
**D. Nxikwe**  
**Nxikwe Diamonds**  
**Date 25 August 2010**

**Prospecting Area:**  
 The figure lettered a, b, c, d,  
 e, f, g, h representing an area  
 of 1812Ha over a portion of  
**Plot 516 Port Nolloth**  
**District: Namaqualand**

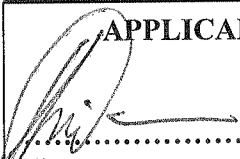
**COORDINATES wgs 84:**

a	S29.26349° E16.89584°
b	S29.22602° E16.87536°
c	S29.22222° E16.89387°
d	S29.25634° E16.91371°
e	S29.30495° E16.89949°
f	S29.30736° E16.89581°
g	S29.29762° E16.88202°
h	S29.26135° E16.88802°

# APPENDIX 1c Landscape



**APPLICANT:**

  
.....

**Signature**

**D. Nxikwe**

**Nxikwe Diamonds**

**Date 25 August 2010**





## **Appendix 2: Prospecting work program**

(as contemplated in regulation 7, of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002))

### **1. Biographic details of the applicant (Reg. 7(1)(a)):**

1.1 Full name of company applying for right  
Dansile Nxikwe Diamonds CC

1.2 Registration number  
2003/019139/23

1.3 Postal address  
P.O. Box 680  
Kuilsrivier 7580

1.4 Physical address  
19 Koekkoek Street  
Amandelsig  
Kuilsrivier 7579

1.5 Applicant's telephone number  
Tel: 021 9031831  
Fax: 021 9031831  
Cell: 071 3399667  
E-mail: [abri@procyan.co.za](mailto:abri@procyan.co.za)

### **2. Plan showing the land to which the application relates (Reg. 7(1)(b))**

Plans as contemplated in sub regulation 2(2) are attach as appendix 1.

### **3. The registered description of the land (Reg. 7(1)(c))**

3.1 Full name of the property on which prospecting operations will be conducted  
Portion of Erf 516 Port Nolloth in extent 2340.4421 Ha. Registered in the name of the Municipality of Port Nolloth by virtue of deed G125/1973.

3.2 Approximate center of prospecting area  
Latitude S29.26552° South  
Longitude E16.90331° East

3.3 Magisterial district  
Namaqualand

### **4. The mineral to be prospected for (Reg. 7(1)(d))**

Diamonds.

## 5. Geological description of the land (Reg. 7(1)(e))

The area is underlain by basement rocks of the Namaqua Metamorphic Belt of Proterozoic age and Cenozoic deposits (calcrete, clastic sediments and sand of Quaternary and Tertiary age). The edge of the Archaean Kaapvaal Craton lies about 500km to the east of this province. The Namaqua metamorphics are comprised mainly of gneissic rocks of the Bushmanland Group that were later intruded by a variety of granitic rocks. The metamorphic event that impacted on this suite of rocks is dated at 1800 Ma. Younger flat lying unaltered sedimentary rocks of the Nama Group occur as hills throughout this area, particularly in the area between Springbok and the Orange River. The plateau region is partly overlain by the basal Karoo sediments of Lower Palaeozoic age. Outcrops of Dwyka tillites can be seen and a variable thickness of Kalahari sands of Tertiary to Recent age covers much of the region. The regional geology of the area is characterised by metasediments (pelitic gneiss, amphibolite, gray biotite gneiss, calc-silicate gneiss, marble and thin lenses of quartzite) of Mokolian age Appendix 2a.

The ancestral Buffels River and related systems exhibit a complex geological history with the first economically significant occurrence of diamonds relating to palaeo-drainage evolving in the Early to Middle Cretaceous (120-100Ma). Re-use of these fluvial conduits has occurred during the Late Miocene (Proto deposits) and again in the Plio-Pleistocene and Quaternary eras (Meso deposits), culminating in the modern Buffels River. These later Buffels events exploited the 'median' channel of this remnant drainage basin, which now represents an entrenched transverse (east west trending) master stream consequent. In each case, previous valley fills have been exhumed and replaced by successive cycles of aggradation and degradation, resulting in stepped terraces of remnant older (higher elevation) Cretaceous and younger Miocene deposits (middle elevation) that are blanketed in Meso gravel bars (lowest elevation). The entrenched modern river represents the last Meso phase (of 3 recognisable phases) and is 6-8m below a set of distinctive paired terraces (second Meso phase) fringing the modern river valley.

In each instance, the base of these successive fills is floored by a basal unconformity upon which lies a fining upwards sequence of gravels, grits and coarse sands of varying maturity, terminating in an aggradational valley-flooding sequence of silts and clays. Terrigenous deposits that commonly contain hardpan layers (calcrete, ferricrete) blanket the top of the fluvial sequence. A ubiquitous indurated aeolian sand (Dorbank) layer, overlain by ilmenite-rich aeolian sand sheets and transgressive dune corridors, comprise the final sedimentary succession

Expected Overburden: The overburden is expected to consist of loose red brown windblown sand (fine-medium grained, well-sorted) 1-2m thick which is underlain by a cemented red-brown aeolian and terrigenous (Dorbank) unit of 1-6m in thickness. The cement is partly calcareous. Underlying this is a further aeolian unit comprising yellow to yellow-brown sand that may be intercalated with fluvial silt lenses towards its base and comprising fine-medium grained sand, 10-30m thick. Immediately below lies a terrigenous/episodic stream deposits consisting of silt, argillaceous quartzo-feldspathic coarse sand and grits. Angular to sub-angular clasts ranging from 4 – 200mm diameter may be present. This horizon varies in thickness from 0 – 5m.

Underlying this is the first of the true fluvial sequences relating to the ancestral Buffels. A fluvial grey clay/silt horizon (0-10m thick) coarsens down into a fluvial arenaceous quartz sand and grit. Suspended pebble gravel layers may be present with a clast size

ranging from 4 – 100mm. Intermittent, inter-bedded grey clay lenses may also be present. Overburden is expected to comprise a range from 30 – 49m in thickness.

Expected Ore Zone: The ore zone is expected to consist of an oligomictic vein quartz clast assemblage of texturally sub-angular to well-rounded (inherited?) clasts. These are poorly sorted with a range in diameter from 4 – 400mm. Clasts larger than 250mm are rare. The matrix should consist of fine to coarse sand and grit (arenaceous) which may develop laterally into argillaceous units with occasional intercalated clay lenses within the ore horizon. In over-deepened areas (i.e. scours) the matrix may become kaolinitic, indicating an older developed gravel (erosional remnant) of Cretaceous-age (type 2 placer). The predominant heavy mineral in the ore horizon is staurolite, garnet and kyanite with minor gorceicexite (Aluminium phosphate rich in REE's) in some areas. Ore thickness varies from 0.3m – 5.0m with an average thickness of 2.4m.

Footwall: The footwall consists predominantly of a moderately weathered to weathered gneissic suite of rocks assigned to the NMC. Mafic biotite schists also occur to a lesser degree and may be fresh or weathered.

A water table may occur 10m above bedrock

## **6. Determining of mineral resource and mineral distribution (Reg. 7(1)(f)(g))**

The mineral resource and mineral distribution of the prospecting area will be determined through a process of geo-physical work as an initial phase. Geo-physical work will include the mapping of areas with a good surface expression and the investigation of old prospecting pits and trenches within the prospecting area. This will be followed by mapping and a possible Airborne Electro-magnetic Survey (AEM) or alternatively, a ground-based EM survey.

Some of the historic trenches will then be cleaned to bedrock to test the gravels for mineralisation.

Samples (prospecting pits of 25m<sup>2</sup> and approximately 33 tonnes in weight per meter advance) will then be recovered to determine the amount of mineralisation through the recovery and treatment of samples.

Pitting will be conducted by mechanical means with a 30-ton excavator. The topsoil and overburden comprising approximately 75% of the volume will be placed on the banks of the pits in windrows and the gravel will be removed to the recovery plant area with dumpers or Articulated Dump Trucks (ADTs). The position of the plant will be determined relative to the position of the trenches.

Bulk samples by means of trenching may be required to supplement the sampling program depending on the results and where depth constraints will allow. Prospecting trenches planned to cross the entire width of the palaeochannels (therefore of variable length) and up to 8 meters wide and maximum 40m in depth, may be excavated to allow a Diamond Ore Characterisation (DOC) study for metallurgical purposes and to allow the sufficient recovery of diamonds for evaluation and foot printing purposes.

The number of trenches will be determined after the initial Geo-physical work and sampling program. The layout plans will be updated together with regular performance assessments and an update of the financial provisions in place for rehabilitation as the prospecting program advances.

Gravel removed from the trenches will be stockpiled near the plant area for analyses and treatment. The extent of the stockpiles will never exceed 200m<sup>3</sup>. All material larger than 75 mm will be seen as coarse waste or over-size material. Back filling of over-size material will be conducted simultaneously with the hauling of the unprocessed gravel.

### 7. Planned prospecting activities (Reg. 7(1)(h)(i)(k))

The activities are set out according to phases and within specific timeframes with a cost estimate of the expenditure to be incurred for each phase of the proposed prospecting operation.

#### 7.1 Phase 1 – Preparatory Phase (Year 1)

Collecting of existing data and maps from surrounding mining activities and historic data  
Estimated expenditure:

a) Direct prospecting costs	
Transport	R 10 000.00
b) Labor costs	
None	R 0.00
c) Rehabilitation and management of environmental impacts	
None during the first phase	R 0.00
<b>Total</b>	<b>R 10 000.00</b>

#### 7.2 Phase 2 – Mapping and Remote Sensing (Year 1 and 2)

Demarcation of grids for geophysical profiling (Gridlines 25m apart and station intervals to be surveyed at 10m)

Geophysical profiling - Geonix EM-34 electromagnetic system or Airborne Electromagnetic Survey (AEM)

Capturing of data and contouring measured resistivity contact

Compiling contour maps and three-dimensional diagrams

Demarcation of grids for pitting

Estimated expenditure:

a) Direct prospecting costs	
Geo-consultants	R 20 000.00
b) Labor costs	
None	R 0.00
c) Rehabilitation and management of environmental impacts	
None during the second phase	R 0.00
<b>Total</b>	<b>R 20 000.00</b>

#### 7.3 Phase 3 Sampling pitting (Year 3 and 4)

Updating of layout plans

Performance assessment and update of quantum of financial provision for rehabilitation

Transport and installation of earth moving equipment

Pitting 25m<sup>2</sup> recovery of samples at approximately 33 tonnes in weight per meter advance

Treatment of samples

Analyzing and capturing of data.

Rehabilitation of prospecting pits

Estimated expenditure:

a) Direct prospecting costs	
Recovery and treatment of samples	
600 meter @ 33 tonne/meter @ R15/tonne =R500/meter advance)	R 300 000.00
b) Labor costs	
Salaries – 3 workers @ R2 500.00 per month (only for demarcation)	R 7 500.00
c) Rehabilitation and management of environmental impacts	
Rehabilitation of prospecting pits	R 10 000.00
Updating EMP and performance assessment	R 2 500.00
<b>Total</b>	<b>R 320 000.00</b>

7.4 Phase 6 Bulk sampling trenches (Year 4 and 5)

Bulk samples by means of trenching may be required to allow a Diamond Ore Characterisation (DOC) study for metallurgical purposes and to allow the sufficient recovery of diamonds for evaluation and foot printing purposes. This will however only take place depending on the previous results and where depth constraints will allow therefore it is not practical to plan for trenching at this early stage. Prospecting trenches planned to cross the entire width of the palaeochannels (therefore of variable length) and up to 8 meters may be excavated and the number of trenches will be determined after the initial Geo-physical work and sampling program. The layout plans will be updated together with regular performance assessments and an update of the financial provisions in place for rehabilitation as the prospecting program advances.

7.5 Phase 7 (Year 5)

Application for mining right or rehabilitation and closure

The following tasks are based on the worse case scenario of closure

Removing prospecting equipment from prospecting area and final rehabilitation

Closure plan, risk assessment and final performance assessment

Estimated expenditure:

a) Direct prospecting costs	
NA	
b) Labor costs	
Salaries – 6 workers @ R2 500.00 per month (only for cleanup)	R 15 000.00
c) Rehabilitation and management of environmental impacts	
Closure plan, risk assessment and final performance assessment	R 2 000.00
<b>Total</b>	<b>R 17 000.00</b>

**8. Financial and technical ability (Reg. 7(1)(j))**

Dansile Nxikwe Diamonds CC will make use of in-house personnel experience in the specific field of prospecting. Mr. Abri Zaaiman (Snr) one of the members will be the project coordinators and have more than forty years experience in project management and Geophysical work. See CV attached as appendix 3a - 2.

Procyan Systems will supply the technical support as stipulated in the heads of agreement of Joint Venture between Nxikwe Diamonds and Procyan Systems (Appendix 3a-1). The Corporation will also be supported by members of the community of Komaggas with regard to unskilled labor.

### 8.1 Financial ability Reg. 7(1)(j)(ii))

Dansile Nxikwe Diamonds CC will be supported by Red Oryx R & D (trading as Red Dune Diamonds) with regard to financial resources. Red Oryx R & D has resolved that they will finance the proposed prospecting operation (Appendix 3b-1). A three month bank statement as proof of access to the necessary funds is attached as Appendix 3b-2.

The estimate given in section 7 cannot be used to determine operational cost as it assumes that the operation will run until completion but in reality the volume and area to be explored will be determined by the profitability of the area. The profitability of an area will largely be determined by the grade, stripping ratio and average stone size. If an area is profitable it means in any way that prospecting cost will be covered by selling of the diamonds found in the course of prospecting operations conducted.

Dansile Nxikwe Diamonds CC therefore also wish to apply for written permission in terms of Section (20) to remove and dispose for its own account of diamonds found in the course of prospecting operations conducted pursuant to such prospecting right.

### **9. Permission to remove and dispose of minerals**

Dansile Nxikwe Diamonds hereby wish to apply for written permission in terms of Section (20) to remove and dispose for its own account of bulk samples of diamonds found in the course of prospecting operations conducted pursuant to such prospecting right.

### **10. Undertaking**

Dansile Nxikwe Diamonds CC hereby undertake to adhere to the proposals as set out in this prospecting work program and to accept full responsibility for the successful completion of the prospecting program in a healthy and safe manner.

  
**Dansile Nxikwe**  
**Dansile Nxikwe Diamonds CC**







### APPENDIX 3: ESTIMATED REHABILITATION COST

The area will be rehabilitated with the original land use namely small stock farming in mind and the productivity of the area after closure will be the same as before prospecting operations started.

Rehabilitation cost was estimated with the proposed end-state in mind and was calculated according to the categories listed in section F of the EMP. Although the applicant have his own equipment the tariffs for equipment was based on local hiring tariffs in Port Nolloth the closest large centre.

#### Rehabilitation of access roads

No access roads will be constructed by the holder of the permit only existing farm roads will be used. The rehabilitation of drill lines will form part of the rehabilitation of excavation areas.

#### Rehabilitation of the office/camp site

No campsite will be establish temporary housing will be obtained in Port Nolloth

#### Rehabilitation of vehicle maintenance yard and secured storages areas

No vehicle maintenance yard and secured storages areas will be constructed during the prospecting operation due to the close proximity to Port Nolloth.

#### Rehabilitation of excavation areas

The goal of rehabilitation with respect to the area is to leave the area level and even, and in a natural state to accomodate natural revegetation and containing no foreign debris or other materials.

All scrap and other foreign materials will be removed from the area and disposed of as in the case of other refuse whether these accrue directly from the prospecting operation or are brought on to the site from outside. Over burden and coarse material removed from the drill holes and/or excavation will be used to fill the excavations.

Once over burden have been backfilled the excavations will be profiled with acceptable contours and erosion control measures, the topsoil previously stored, will be returned to its original depth over the area to fasilitate natural regrowth.

##### Rehabilitation of drilling traverses.

Rehabilitation of RC drilling holes will take place on a continious basis as results became available. Rehabilitation cost is calculatated for manual labour asuming that there will be 50 un-rehabilitated holes present at any given time (worst case scenario).

- Number of holes for back filling: 50
  - Duration of rehabilitation: (2h /h) 100 hours.
  - Equipment required: R5 000.00
- Manual labour @ R50.00/h for backfilling

##### Rehabilitation of trenches.

Rehabilitation bulk sample trenches will also take place on a continious basis as results became available. Rehabilitation cost is calculatated asuming that there will be 1 un-rehabilitated trenche (100 X 8 X 4 m) present at any given time.

- Volume of earth for back filling: 3200 m<sup>3</sup>
- Duration of rehabilitation: @200m<sup>3</sup>/h 16 hours.
- Equipment required:

966 Front end loader for back filling 16 h X R450.00/h	R 7 500.00
Manual labour @ R50.00/h for cleanup	R 5 000.00
Lowbed for transport of equipment 20 Km @ R20./Km	R 400.00
<b>Cost of rehabilitation :</b>	<b>R 17 900.00</b>

### **Final rehabilitation**

Existing farm roads will be used by the drill and where not possible the new road will be kept to a minimum. The roads will be rehabilitated by hand as part of final rehabilitation. All infrastructure, equipment, and other items used during the prospecting period will be removed from the site.

Extent:

• Duration of rehabilitation:	20 hours.
• Equipment require:	
Manual labor for cleanup and closing of roads	R 5 000.00
<b>Cost of rehabilitation:</b>	<b>R 5 000.00</b>

### **Rehabilitation of processing areas**

No processing will take place on site. If and when trenching is done testing of gravel will be negotiated at the marine plant in Port Nolloth or the EMP will be amended and rehab updated. Gravel will be treated by inpit screening and rough will be backfilled. Only concentrate will be hauled to the plant and medium to fine residue will be hauled back on the return trip for backfilling.

### **Total cost of rehabilitation :**

Rehabilitation of access roads	R 0.00
Rehabilitation of the office/camp site	R 0.00
Rehabilitation of vehicle maintenance yard and storages areas	R 0.00
Rehabilitation of drilling traverses	R 5 000.00
Rehabilitation of trenches	R 17 900.00
Final rehabilitation	R 5 000.00
Rehabilitation of processing areas	R 0.00
<b>Total</b>	<b>R 27 900.00</b>

The applicant is willing to escalate the estimated amount of R27 900.00 that is needed for rehabilitation to **R30 000.00**. Financial provision required under Regulation 54 for the amount of **R30 000.00** that is more than is needed for the rehabilitation of damage caused by the operation, both at sudden closure during the normal operation of the project or at final, planned closure will be furnish to DME. The quantum of financial provision will be updated annually with the performance assessment and also before commencing with bulk sampling depending on the results of prospecting. If at any stage the outstanding rehabilitation is more than this estimation the quantum of financial provision will be updated.