mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

And

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

SUBMITTED FOR ENVIRONMENTAL AUTHORIZATIONS IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 AND THE NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT, 2008 IN RESPECT OF LISTTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY APPLICATIONS IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (MPRDA) (AS AMENDED)

NAME OF APPLICANT: **BOKAMOSO EXPLORATION (PTY) LTD**
TEL NO: **082 461 8105 (Mat)**
FAX NO: **086 510 7120**
POSTAL ADDRESS: **PO Box 365; Barkly-Wes; 8375**
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FILE REFERENCE NUMBER SAMRAD: **(NC) 30/5/1/1/2/12563 PR**

1. IMPORTANT NOTICE

In terms of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002 as amended), the Minister must grant a prospecting or mining right if among others the mining "will not result in unacceptable pollution, ecological degradation or damage to the environment".

Unless an Environmental Authorisation can be granted following the evaluation of an Environmental Impact Assessment and an Environmental Management Programme report in terms of the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA), it cannot be concluded that the said activities will not result in unacceptable pollution, ecological degradation or damage to the environment.

In terms of section 16(3)(b) of the EIA Regulations, 2014, any report submitted as part of an application must be prepared in a format that may be determined by the Competent Authority and in terms of section 17 (1)(c) the competent Authority must check whether the application has taken into account any minimum requirements applicable or instructions or guidance provided by the competent authority to the submission of applications.

It is therefore an instruction that the prescribed reports required in respect of applications for an environmental authorisation for listed activities triggered by an application for a right or a permit are submitted in the exact format of, and provide all the information required in terms of, this template. Furthermore, please be advised that failure to submit the information required in the format provided in this template will be regarded as a failure to meet the requirements of the Regulation and will lead to the Environmental Authorisation being refused.

It is therefore an instruction that the Environmental Assessment Practitioner must process and interpret his/her research and analysis and use the findings thereof to compile the information required herein. (Unprocessed supporting information may be attached as appendices). The EAP must ensure that the information required is placed correctly in the relevant sections of the Report, in the order, and under the provided headings as set out below, and ensure that the report is not cluttered with un-interpreted information and that it unambiguously represents the interpretation of the applicant.

2. OBJECTIVE OF THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

The objective of the environmental impact assessment process is to, through a consultative process—

(a) determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context;

(b) describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;

(c) identify the location of the development footprint within the preferred site based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;

(d) determine the—

  (i) nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and

  (ii) degree to which these impacts—

    (aa) can be reserved;

    (bb) may cause irreplaceable loss of resources; and

    (cc) can be avoided, managed or mitigated.

(e) identify the most ideal location for the activity within the preferred site based on the lowest level of environmental sensitivity identified during the assessment;

(f) identify, assess, and rank the impacts the activity will impose on the preferred location through the life of the activity;

(g) identify suitable measures to manage, avoid or mitigate identified impacts; and

(h) identify residual risks that need to be managed and monitored.

PART A

SCOPE OF ASSESSMENT AND ENVIRONMENTAL IMPACT ASSESSMENT REPORT

3. Contact Person and Correspondence Address

a) Details of:-

i) Details of the EAP who prepared the report:

Name of the Practitioner:	**ROELIEN OOSTHUIZEN**
Tel No.:	**084 208 9088**
Fax No.:	**086 510 7120**
E-mail address:	roosthuizen950@gmail.com
Physical Address:	**Farm Oberon; Kimberley, 8301**
Postal Address:	**P.O. Box 110823, Hadisonpark, 8306**

ii) Appointed by:

Bokamoso Exploration (Pty) Ltd

iii) Expertise of the EAP

(1) **The qualifications of the EAP**

Masters in Environmental Management (UFS)
B-Comm in Human and Industrial- Psychology (NWU)
(with evidence attached as **Appendix 1**)

(2) **Summary of the EAP's past experience**

(In carrying out the Environmental Impact Assessment Procedure)

Relevant past experiences in carrying out the Environmental Impact Assessment Procedures include Environmental Impact Assessments, Environmental Management Plans/Programmes/ Reports, Performance assessments, Rehabilitation progress assessments, Environmental Liability assessments, Environmental compliance monitoring, Scoping Reports, etc. See attached CV.
(with evidence attached as **Appendix 2**)

b) Description of the property

Farm Name:	PORTION 6 (EMIL – A PORTION OF PORTION 3 (ONVERWAG)) OF THE FARM ELANDS DRIFT 159, BARKLY-WES REMAINING EXTENT OF PORTION 1 OF THE FARM SLANGHEUVEL 160, BARKLY-WES NORTHERN CAPE PROVINCE, REPUBLIC OF SOUTH AFRICA.
Application area (Ha)	1079.1889ha (One thousand and seventy-nine comma one eight eight nine) hectares in extent
Magisterial district:	Barkly West, Northern Cape Province
Distance and direction from nearest town	The property is located approximately 60km North of Kimberley between the towns of Barkly-Wes and Windsorton on the R374, Northern Cape Province
21 digit Surveyor General Code for each farm portion	C00700000000015900006 C00700000000016000001

c) Locality map (show nearest town, scale not smaller than 1:250000)

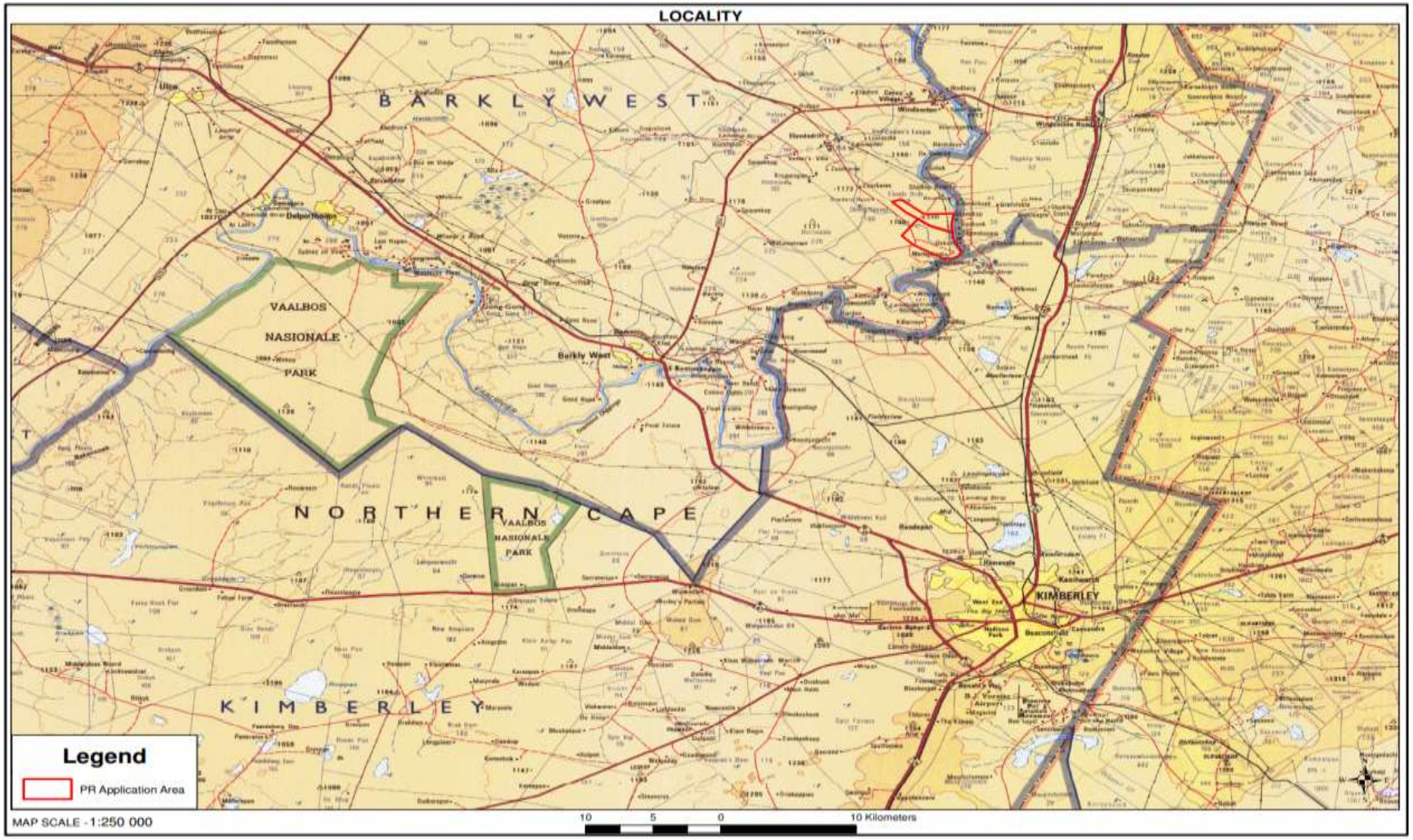


Figure 1. Locality Map 1: 250 000 indicating the application area in RED.

d) Description of the scope of the proposed overall activity

(provide a plan drawn to a scale acceptable to the competent authority but not less than 1: 10 000 that shows the location, and area (hectares) of all the aforesaid main and listed activities, and infrastructure to be placed on site)

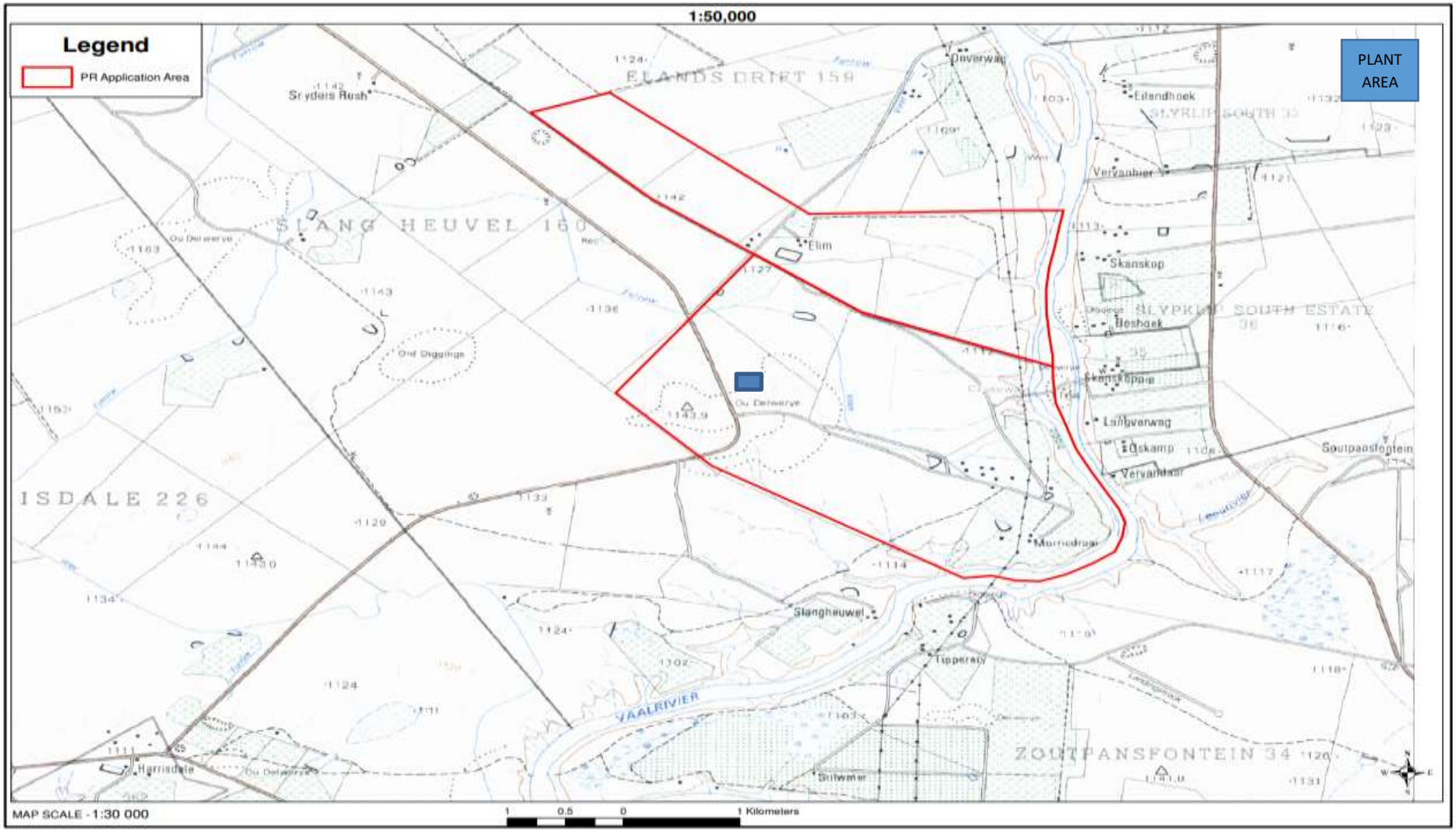


Figure 2. Location, and area (hectares) of all the aforesaid main and listed activities, and infrastructure to be placed on site).

i) Listed and specified activities

Table 1: Listed and Specified Activities

Name of activity (e.g. Excavations, blasting, stockpiles, discard dumps or dams, loading, hauling and transport, water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)	Aerial extent of the activity (Ha or m²)	Listed Activity (mark with an X where applicable or affected)	Applicable Listing Notice (GNR544, GNR545 or GNR546 / Not listed GNR983, GNR984, GNR985/ Not listed)
Activity 9: "The development of infrastructure exceeding 1000 metres in length for the bulk transportation of water or storm water- (vii) with an internal diameter of 0.36 metres or more; or (viii) with a peak throughput of 120 litres per second or more;	Water distribution Pipelines	X	NEMA: LN1 (GNR327)
Activity 12: "The development of— The development of- (i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or **(ii) infrastructure or structures with a physical footprint of 100 square metres or more;** where such development occurs— (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse" Regulation GN R704, published on 4 June 1999 in terms of the National Water Act (Use of water for mining and related activities)	Clean and dirty water system It is anticipated that the operation will establish storm water control berms and trenches to separate clean and dirty water on the prospecting site.	X	NEMA: LN1 (GNR327)
Activity 13: "The development of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, with a combined capacity of 50 000 cubic metres or more, unless such storage falls within the ambit of activity 16 in Listing Notice 2 of 2014"	Clean water dam or return water dam	X	NEMA: LN1 (GNR327)

Activity 14: "The development and related operation of facilities or infrastructure, for the storage and handling, of dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres.	2 X 23 000l diesel tanks = 46 000l with capacity for storing of old oils and new oils to be calculated	X	NEMA: LN1(GNR327)
Activity 20: Any activity including the operation of that activity which requires a prospecting right in terms of section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including – (a) associated infrastructure, structures and earthworks, directly related to prospecting of a mineral resource; or (b) the primary processing of a mineral resource including winning, extraction, classifying, crushing, screening or washing; But excluding the secondary processing of a mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource in which case activity 6 in Listing notice 2 applies. The Bokamoso operation directly relates to prospecting of a mineral resource (diamonds) and requires a prospecting right.	1079.1889ha Although the total area will never be prospected and the footprint with the drilling and bulk sampling is calculated to be ±60ha. Invasive Prospecting Pits 20 Trenches will be excavated with the following dimensions 100m X 200m = 40 ha pits that prove to contain gravels (tested positive). It is estimated that on average 3m of overburden (calcrete and soil) will be removed before accessing the gravel layer (average width 2m) which is host to the diamonds. The 5X bulk samples will be 200m X 200m (20 ha) X 0.5 – 5m deep.	X	NEMA: LN1 (GNR327)
Activity 24: The development of a road- (ii) a road with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 meters;	Access and haul roads	X	NEMA: LN1 (GNR 327)
Activity 15: The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for-	±60 ha	X	NEMA: LN2 (GNR325)

(i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.			
Activity 19: The removal and disposal of minerals contemplated in terms of section 20 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including- (a) associated infrastructure, structures and earthworks, directly related to prospecting of a mineral resource; or The primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing. The Bokamoso operation directly relates to prospecting of a mineral resource (diamonds) and requires permission in terms of Section 20 (MPRDA), for the removal and disposal of bulk samples of any minerals.	1079.1889ha. Although the total area will never be prospected and the footprint with the bulk sampling is calculated to be ± 60 ha.	X	NEMA: LN2 (GNR325)
Activity 15: The establishment of residue deposits resulting from activities which require a prospecting right.	0.3ha		NEMWA: Category A (GNR 633)
Office complexes Temporary workshop facilities Storage facilities Concrete bund walls and diesel depots Ablution facilities Topsoil stockpiles Overburden stockpiles Water tanks	± 200 m2 ± 300 m2 ± 2 000 m2 ± 250 m2 ± 30 m2 ± 500 m2 5 000 m2 3m x 3m = 9m² each		Not Listed
Waste disposal site (domestic and industrial waste): It is anticipated that the operation will establish a dedicated, fenced waste disposal site with a concrete floor and bund wall. The following types of waste will be disposed of in this area:	15m x 30m = 450m²		Not Listed

• Small amounts of low-level hazardous waste in suitable receptacles. • Domestic waste. • Industrial waste.			

ii) Description of the activities to be undertaken

(Describe methodology or technology to be employed, including the type of commodity to be mined and for a linear activity, a description of the route of the activity)

The prospecting operation is primarily based on alluvial diamond deposits that are restricted to the alluvial terraces west of the Vaal River. These deposits are associated with the older Nooitgedacht and Holpan gravels, which lie 80 – 100 m and 60 m above the present river level, respectively; as well as the younger Rietputs Formation, which is found along the 12 – 14 m floodplains.

The deposits will be sampled by means of drilling, pitting, and trenching. Approximately 150 boreholes of 6 – 10 m deep will be drilled across a grid on the alluvial terraces in the study area to determine the distribution of the gravel body. Thereafter, 20 trenches (150 m x 100 m x 0.5 - 7 m each) will be created to test the gravels, of which 5 will undergo bulk sampling. This will be performed by means of an opencast method using heavy earthmoving machinery. Vegetated soil or overburden will be stripped and the underlying gravels will be excavated, screened and treated through a rotary plan plant before fed to a sorting plant for final recovery. The rough diamond product will then be removed for further beneficiation. No ore processing reagents are required or used in the treatment of the ore. An estimated total volume of 300 000 m3 and 157 500 m3 for trenching and bulk sampling will be processed, respectively over 5 years.

Prospecting activities will primarily make use of existing roads where possible, but temporary infrastructure and additional haul roads will be created to access new prospecting trenches. The proposed infrastructure and prospecting related footprint include access roads, temporary office and workshop complex, ablution facilities, storm water control berms, water tank, fuel storage facility, wash bay, central processing plants, slimes dam, salvage yard, waste disposal site, pipeline infrastructure, open pits and trenches, overburden stockpiles and gravel stockpiles.

e) Table 2. Policy and Legislative Context

Applicable Legislation and Guidelines used to compile the report (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process.)	Reference where applied	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE POLICY AND LEGISLATIVE CONTEXT (E.g In terms of the National Water Act:-Water Use License has/has not been applied for).
Conservation of Agricultural Resources Act (Act 43 of 1983) and Regulations (CARA)	- Section 5: Implementation of control measures for alien and invasive plant species; - Section 6: Control measures. - Regulation GN R1048, published on 25 May 1984, in terms of CARA	- Control measures are to be implemented upon the approval of the EMPR.
Constitution of South Africa (Act 108 of 1996)	- Section 24: Environmental right - Section 25: Rights in Property - Section 27: Water and sanitation right	- To be implemented upon the approval of the EMPR.
Environment Conservation Act (Act 73 of 1989) and Regulations (ECA)	- Sections 21, 22, 25, 26 and 28: EIA Regulations, including listed activities that still relate to the existing section of ECA. - Section 28A: Exemptions.	- To be implemented upon the approval of the EMPR.
Fencing Act (Act 31 of 1963)	- Section 17: States that any person erecting a boundary fence may clean any bush along the line of the fence up to 1.5m on each side thereof and remove any tree standing in the immediate line of the fence. However, this provision must be read in conjunction with the environmental legal provisions relevant to protection of flora.	- Control measures are to be implemented upon the approval of the EMPR.

Hazardous Substances Act (Act 15 of 1973) and Regulations read together with NEMA and NEMWA	- Definition, classification, use, operation, modification, disposal or dumping of hazardous substances.	- Noted and Considered measures are to be implemented upon the approval of the EMPR.
Intergovernmental Relations Act (Act 13 of 2005)	- This Act establishes a framework for the National, Provincial and Local Governments to promote and facilitate intergovernmental relations.	
Mine, Health and Safety Act (Act 29 of 1996) and Regulations	- Entire Act.	- Control measures are to be implemented upon the approval of the EMPR.
Mineral and Petroleum Resources Development Act (Act 28 of 2002) and Regulations as amended	- Entire Act. - Regulations GN R527	- A Prospecting Right has been applied for (NC) 30/5/1/1/2/12563 PR. - Rights and obligations to be adhered to.
National Environmental Management Act (Act 107 of 1998) and Regulations as amended	- Section 2: Strategic environmental management principles, goals and objectives. - Section 24: Foundation for Environmental Management frameworks. - Section 24N: - Section 24O: - Section 28: The developer has a general duty to care for the environment and to institute such measures to demonstrate such care. - Regulations GN R547, more specifically Chapters 5 and 7, where applicable (the remainder was repealed) published on 18 June 2010 in terms of NEMA (Environmental Management Framework Regulations) - Regulations GN R982 to R985, published on 4 December 2014 in terms of NEMA (Listed Activities) - Regulations GN R993, published on 8 December 2014 in terms of NEMA (Appeal)	- Control measures are to be implemented upon the approval of the EMPR.

	- Regulations GN R994, published on 8 December 2014 in terms of NEMA (exemption) - Regulations GN R205, published on 12 March 2015 in terms of NEMA (National appeal Amendment Regulations) - Regulations GN R1147, published on 20 November 2015 in terms of NEMA (Financial Provision)	
National Environmental Management: Air Quality Act (Act 39 of 2004)	- Section 32: Control of dust - Section 34: Control of noise - Section 35: Control of offensive odours - Regulation GN R551, published on 12 June 2015 (amended Categories 1 to 5 of GN 983) in terms of NEM:AQA (Atmospheric emission which have a significant detrimental effect on the environment) - Regulation GN R283, published on 2 April 2015 in terms of NEM:AQA (National Atmospheric Emissions Reporting Regulations) (Group C-Mines)	- Control measures are to be implemented upon the approval of the EMPR. - This is also legislated by Mine Health and Safety from DMR and is to be adhered to.
National Environmental Management: Biodiversity Act (Act 10 of 2004)	- Section 52 of The National Environmental Management Act: Biodiversity Act (NEMBA) (Act 10 of 2004) states that the MEC/Minister is to list ecosystems that are threatened and in need of protection. - Section 53 states that the Minister may identify any process or activity in such a listed ecosystem as a threatening process. - A list of threatened and protected species has been published in terms of Section 56(1) GG 29657 GNR 151 and GNR 152, Threatened or Protected Species Regulations.	- A permit application regarding protected plant species need to be lodged with DENC if any protected species is encountered. Control measures are to be implemented upon the approval of the EMPR. - Species protected in terms of the National Forests (NFA) Act No 84 of 1998 include Vachellia erioloba, V. haematoxylon and Boscia albitrunca. The latter species is also protected according to the NCNCA (Schedule 2) and occurs widespread across the study area in all

	Commencement of Threatened or Protected Species Regulations 2007: 1 June 2007 GNR 150/GG 29657/23-02-2007 Publication of lists of critically endangered, vulnerable and protected species GNR 151/GG 29657/23-02-2007 * Threatened or Protected Species Regulations GNR 152/GG 296547/23-02-2007 * - Sections 65 – 69: These sections deal with restricted activities involving alien species; restricted activities involving certain alien species totally prohibited; and duty of care relating to alien species. - Sections 71 and 73: These sections deal with restricted activities involving listed invasive species and duty of care relating to listed invasive species. - Regulation GN R151, published on 23 February 2007 (List of Critically Endangered, Vulnerable and Protected Species, 2007) in terms of NEM: BA - Regulation GN R152, published on 23 February 2007 (TOPS) in terms of NEM:BA - Regulations GN R507 to 509 of 2013 and GN 599 of 2014 in terms of NEM:BA (Alien Species)	vegetation units (Taken out of the eocological study by Dr. Betsie Milne).
The National Environmental Management Act: Protected Areas Act (NEMPAA) (Act 57 of 2003) provides for the protection of ecologically viable areas that are representative of South Africa"s natural biodiversity and its landscapes and seascapes.	- Chapter 2 lists all protected areas.	- The proposed prospecting site does not fall within any critical biodiversity areas, as defined by the Northern Cape Critical Biodiversity Areas Map (Holness and Oosthuysen 2016).

National Environmental Management: Waste Management Act (Act 59 of 2008)	- Chapter 4: Waste management activities - Regulations GN R634 published on 23 August 2013 in terms of NEM:WA (Waste Classification and Management Regulations) - Regulations GN R921 published on 29 November 2013 in terms of NEM:WA (Categories A to C – Listed activities) - National Norms and Standards for the Remediation of contaminated Land and Soil Quality published on 2 May 2014 in terms of NEM:WA (Contaminated land regulations) - Regulations GN R634 published on 23 August 2013 in terms of NEM: WA (Waste Classification and Management Regulations) - Regulations GN R632 published on 24 July 2015 in terms of NEM: WA (Planning and Management of Mineral Residue Deposits and Mineral Residue Stockpiles) - Regulations GN R633 published on 24 July 2015 in terms of NEM: WA (Amendments to the waste management activities list published under GN921)	- To be implemented upon the approval of the EMPR.
National Forest Act (Act 84 of 1998) and Regulations	- Section 15: No person may cut, disturb, damage, destroy or remove any protected tree; or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a licence granted by the Minister.	- A permit application regarding protected tree species needs to be lodged with DAFF if necessary. - Control measures are to be implemented upon the approval of the EMPR.
National Heritage Resources Act (Act 25 of 1999) and Regulations	- Section 34: No person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority. - Section 35: No person may, without a permit issued by the responsible heritage resources	- Control measures are to be implemented upon the approval of the EMPR. - Fossil finds procedure will be attached to the PIA.

	authority destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or paleontological site. - Section 36: No person may, without a permit issued by SAHRA or a provincial heritage resources authority destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a forma cemetery administered by a local authority. - Section 38: This section provides for HIA which are not already covered under the ECA. Where they are covered under the ECA the provincial heritage resources authorities must be notified of a proposed project and must be consulted during HIA process. - Regulation GN R548 published on 2 June 2000 in terms of NHRA	
National Water Act (Act 36 of 1998) and regulations as amended, *inter alia* Government Notice No. 704 of 1999	- Section 4: Use of water and licensing. - Section 19: Prevention and remedying the effects of pollution. - Section 20: Control of emergency incidents. - Section 21: Water uses In terms of Section 21 a licence is required for: (a) taking water from a water resource; (b) storing water; (c) impeding or diverting the flow of water in a watercourse; (f) Waste discharge related water use; (g) disposing of waste in a manner which may detrimentally impact on a water resource; (i) altering the bed, banks, course or characteristics of a watercourse;	- A water use application must be submitted and will be submitted as soon as the EIA EMP had been finalized. - Control measures are to be implemented upon the approval of the EMPR.

	(j) removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and; - Regulation GN R704, published on 4 June 1999 in terms of the National Water Act (Use of water for mining and related activities) - Regulation GN R1352, published on 12 November 1999 in terms of the National Water Act (Water use to be registered) - Regulation GN R139, published on 24 February 2012 in terms of the National Water Act (Safety of Dams) - Regulation GN R398, published on 26 March 2004 in terms of the National Water Act (Section 21 (j)) - Regulation GN R399, published on 26 March 2004 in terms of the National Water Act (Section 21 (a) and (b)) - Regulation GN R1198, published on 18 December 2009 in terms of the National Water Act (Section 21 (c) and (i) – rehabilitation of wetlands) - Regulations GN R1199, published on 18 December 2009 in terms of the National Water Act (Section 21 (c) and (i)) - Regulations GN R665, published on 6 September 2013 in terms of the National Water Act (Amended GN 398 and 399 – Section 21 (e), (f), (h), (g), (j))	
Nature Conservation Ordinance (Ord 19 of 1974)	- Chapters 2, 3, 4 and 6: Nature reserves, miscellaneous conservation measures, protection of wild animals other than fish, protection of Flora.	- Control measures are to be implemented upon the approval of the EMPR.
Occupational Health and Safety Act (Act 85 of 1993) and Regulations	- Section 8: General duties of employers to their employees.	- Control measures are to be implemented upon the approval of the EMPR.

	- Section 9: General duties of employers and self-employed persons to persons other than their employees.	
Road Traffic Act (Act 93 of 1997) and Regulations	- Entire Act.	- Control measures are to be implemented upon the approval of the EMPR.
Water Services Amendment Act (Act 30 of 2007)	- It serves to provide the right to basic water and sanitation to the citizens of South Africa (giving effect to section 27 of the Constitution).	- Control measures are to be implemented upon the approval of the EMPR.
National Land Transport Act, (Act 5 of 1998)		- To take note.
Spatial Planning and Land Use Management (Act 16 of 2013 (SPLUMA) and regulations	- To provide a framework for spatial planning and land use management in the Republic; - To specify the relationship between the spatial planning and the land use management, amongst others - Regulations GN R239 published on 23 March 2015 in terms of SPLUMA	- To be implemented upon the approval of the EMPR.
Subdivision of Agricultural Land Act, 70 of 1970 and regulations	- Regulations GN R373 published on 9 March 1979 in terms of Subdivision of Agricultural Land	- To take note.
Basic Conditions of Employment Act (Act 3 of 1997)) as amended	- To regulate employment aspects	- To be implemented upon the approval of the EMPR
Community Development (Act 3 of 1966)	- To promote community development	- To be implemented upon the approval of the EMPR
Development Facilitation (Act 67 of 1995) and regulations	- To provide for planning and development	- To take note.
Development Facilitation (GNR1, GG20775, 07/01/2000)	- Regulations re application rules S26, S46, S59	- To take note.
Development Facilitation (GN732, GG14765, 30/04/2004)	- Determines amount, see S7(b)(ii)	- To take note.
Land Survey Act (Act 8 of 1997)) and regulations, more specifically GN R1130	- To control land surveying, beacons etc. and the like;	- To take note.

	- Agriculture, land survey S10	
National Veld and Forest Fire Act (Act 101 of 1998)) and regulations, more specifically GN R1775	- To regulate law on veld and forest fires - (Draft regulations s21)	- To be implemented upon approval of the EMPR

f) Need and desirability of the proposed activities

(Motivate the need and desirability of the proposed development including the need and desirability of the activity in the context of the preferred location)

The Bokamoso Exploration Project is in line with the 'Beneficiation Strategy for the Minerals Industry of South Africa' (DMR, 2011) in terms of aiming to beneficiate diamonds for sale/export. The benefits of this will fall directly to the Northern Cape Province and, specifically, the Dikgatlong District.

In addition, the South African National Development Plan aims to eliminate poverty and reduce inequality by 2030. South Africa can realise these goals by drawing on the energies of its people, growing an inclusive economy, building capabilities, enhancing the capacity of the state, and promoting leadership and partnerships throughout society. The Bokamoso Exploration Project will contribute to achieving this plan in terms of direct and indirect employment of people from the local and district municipalities as well as investment in the region and on a national scale.

Need

Analysis of the Diamond Industry – ALROSA(website)

The Information on the analysis of the diamond industry was obtained from the ALROSA website which is one of the biggest diamond producers in the world.

The world diamond market is represented by diamond mining and trade in rough diamonds. The bulk of the world diamond mining is concentrated in nine countries, with their share in the global production in physical terms as high as 99%.

The world's largest producers of natural diamonds are Russia, the Democratic Republic of Congo (DRC) and Botswana, all together accounting over 60% of the global diamond production.

Top Countries in the Global Diamond Production 2016: 134.1 mln. Carats

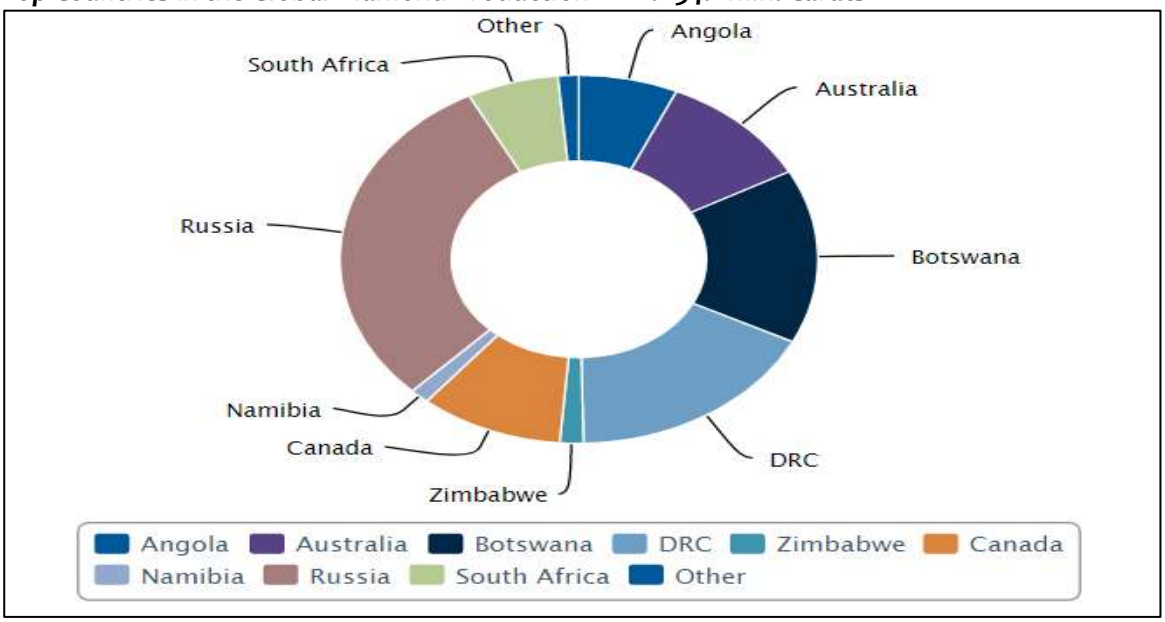


Figure 3. Kimberley Process companies' data Global Diamond Production 2011-16 (thousands carats)

World diamond production based on the costs of produced rough diamonds are dominated by Russia, Botswana and Canada with a combined production of more than 60% of the total worldwide production

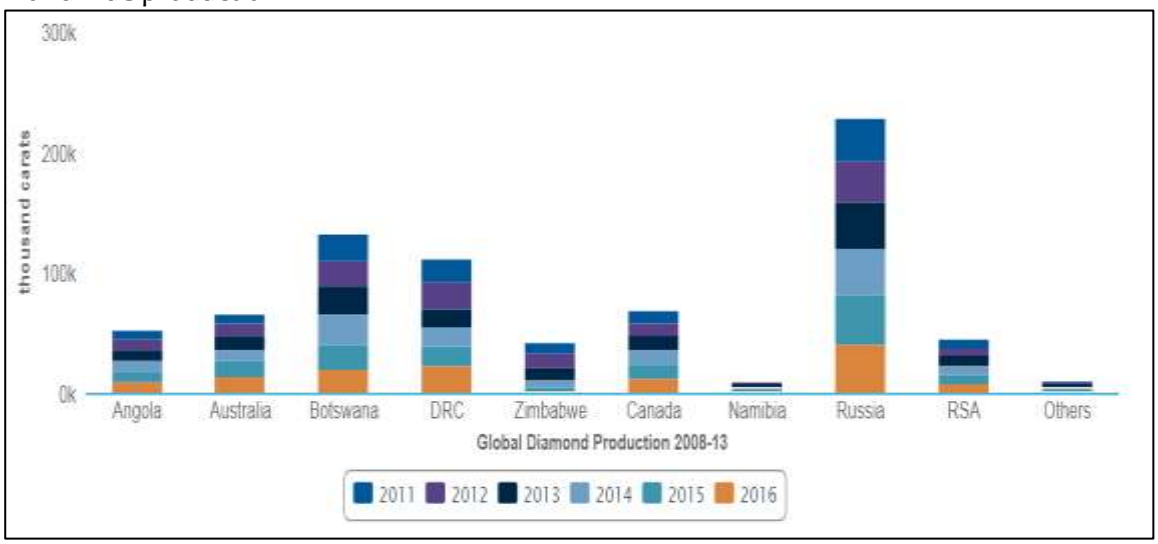


Figure 4. Global Diamond Production 2011-16 (thousands carats) Kimberley Process companies' data

Russia ranks first in the world's diamond production. ALROSA Group accounts for 93% of the total diamond production in the Russian Federation in physical terms, and it is the leader of the global diamond mining industry. Major mining companies are engaged in mining in the main diamond-producing countries, the exception being Zimbabwe and the DRC, where diamond deposits are developed by small companies and prospectors. The graph below represents the geography of the companies' activities including exploration.

Diamond Production by Leading Companies, 2016(* - *including Ekati; Companies' data)*

The world's diamond mining is concentrated in the major primary deposits accounting for about 60% of the global diamond production. The remaining production is concentrated in placer deposits, the principal of them located in the DRC (Mbiji-Mayii) and Zimbabwe (Marange).

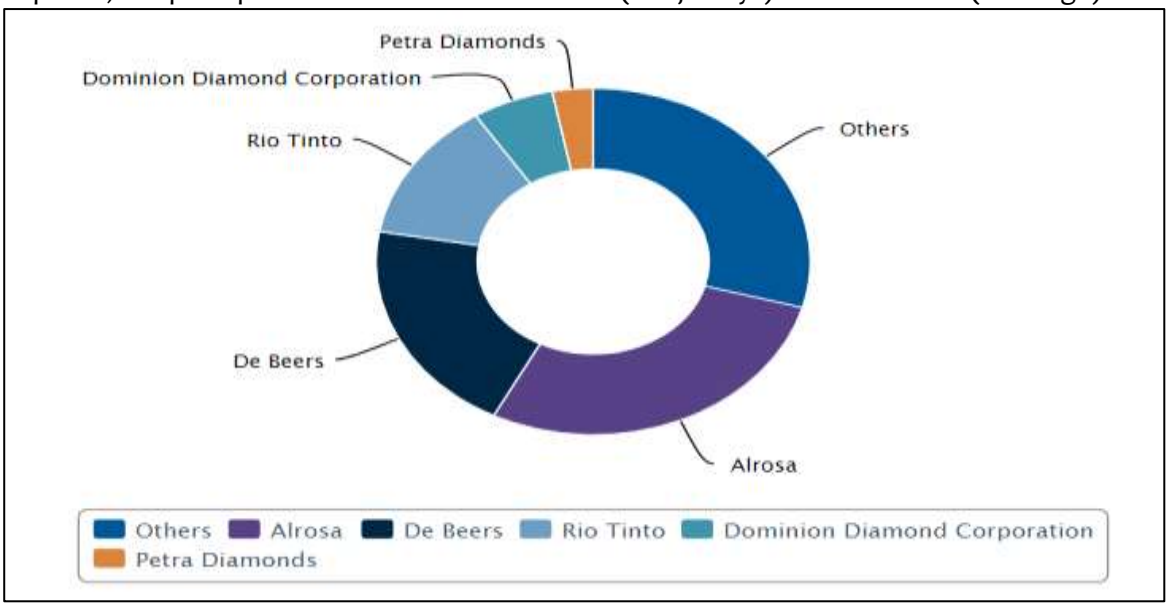


Figure 5. Diamond Production by Leading Companies, 2016(* - *including Ekati; Companies' data)*

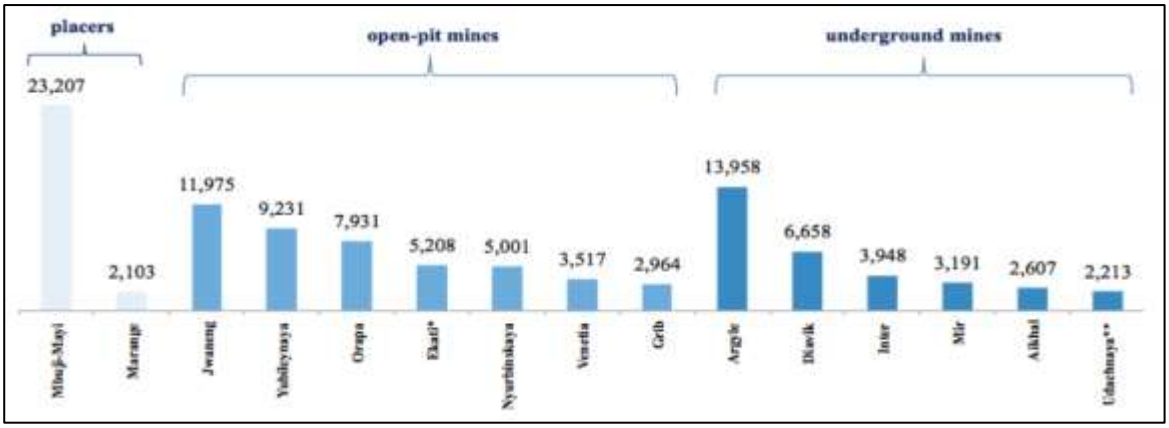


Figure 6. Production Output of the World's Major Diamond Deposits, 2016 (thousand carats) Kimberley Process and compnies' data; ***** - Ekati includes open-pit and undergroung mining; ****** - output, including further development of the open-pit

By their attributes diamonds from deposits fall into two categories: gem quality and industrial grade diamonds. The former is used in diamond jewelry production, while the latter is used for industrial purposes (manufacture of drills, saws, and abrasive powders). Gem quality rough diamonds are sorted by size, color, quality and shape, and then are sold to buyers in conformity with the sales policy adopted in a rough diamond production company. Depending on the quality of the mined rough diamonds, the current state of the market, the adopted marketing policy, companies use different approaches to diamond sales: sights, tenders, auctions, spot transactions and long-term contracts.

The world's largest trading centers, which concentrate the bulk of trade in natural rough diamonds, are India, Belgium, the UAE, the USA, Hong Kong and Israel. Being sold from mines, natural rough diamonds arrive at cutting and polishing plants to become polished diamonds that will be used in jewellery making.

(The information above was sourced from the ALROSA website. ALROSA is a world leader in the world diamond mining industry, a Russian partially state-owned diamond mining company)

The Diamond Pipeline

The Diamond Pipeline can be defined as the route the diamond takes from mine to end consumer. The diamond pipeline, typically, comprises (**Fig. 4**).

Figure 7. The Diamond Pipeline

Exploration/Prospecting; involves geologists finding diamond deposits in different areas. Prospecting is vital to the future survival of any diamond business as there is a predicted supply-demand gap.

Mining and Recovery; once diamonds have been discovered and surveys shown that it is financially viable to mine them; they are now recovered from the ground. The manner in which they are mined and recovered depends on their source, thus, where they are found.

Sorting and valuing; process of sorting and valuing of diamonds, categorizing them according to size, quality, model and colour.

***Cutting and polishing*;** refers to manufacturing of diamonds; the process of turning rough diamonds into polished.
***Polished Market*;** this is referred to as the 'diamond exchange bourse', a place where diamonds are traded. These are located in some of the world's major diamond manufacturing centres, e.g. Belgium.
Retailing; polished diamonds find their way to Jewellers and Consumers through Wholesalers and Retailers.

International Diamond Market Trends

Although global financial stability has proven quite volatile over the past 4-5 years, the diamond industry appears to have stabilised somewhat, with moderate increases in diamond prices forecast for the immediate future.

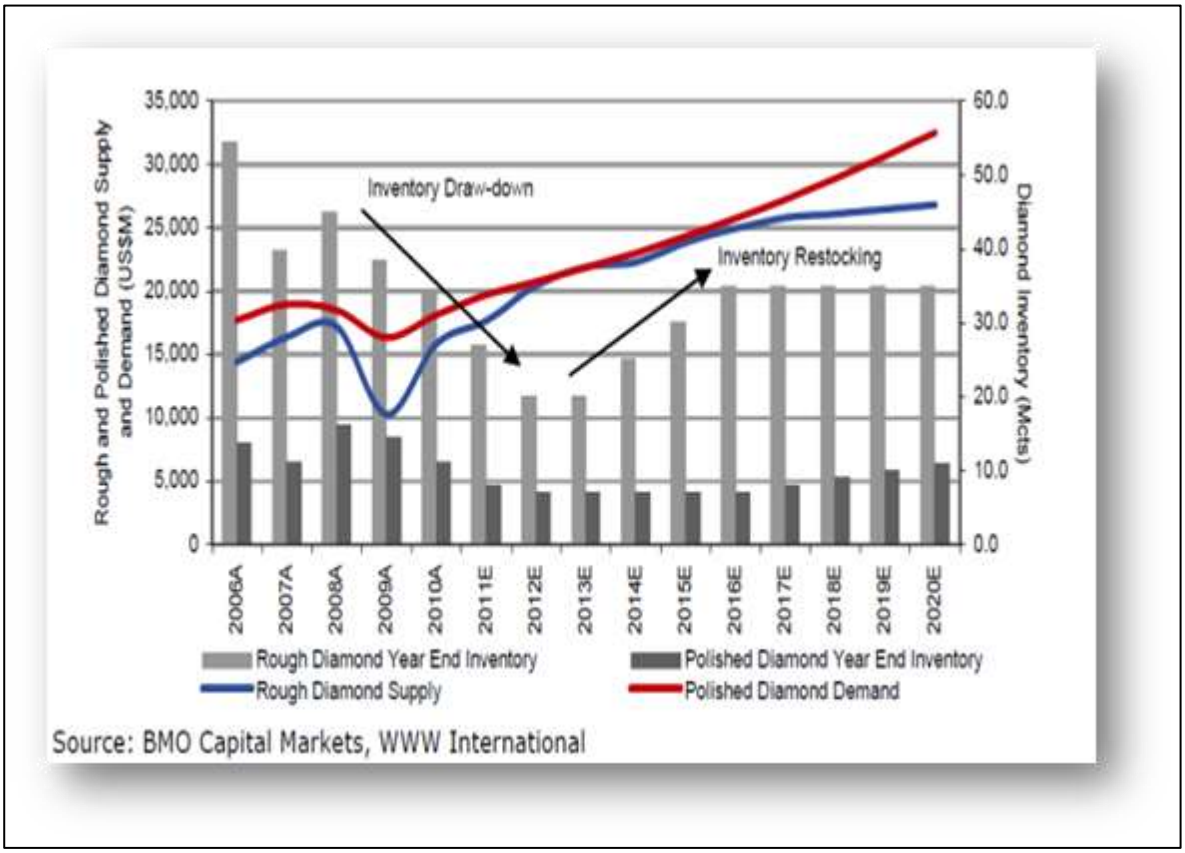


Figure 8. Inventory movements support diamond prices(USDM, Mct)

BMO Capital Markets (Sterck, 2011) estimated at the time that Chinese demand for polished diamonds accounted for 5% or USD1 billion of the market in 2010. While this represents a relatively small proportion of the market currently, growth is extremely strong.

De Beers reported that Chinese demand for polished diamonds grew at 25% in 2010, significantly ahead of GDP growth of 13%. Looking ahead, momentum into 2011 suggests that growth of 15% may be possible. From 2012 onwards, growth in household disposable income is forecast to average 11% to 12% per annum. This translates into minimum growth in diamond demand of 13% per annum.

From 2012 onwards diamond demand is likely to grow in line with economic growth at around 10% per annum. Combining steady demand growth from the established diamond consuming

nations and strong growth in demand from emerging consumer's results in a forecast of polished diamond demand almost doubling by 2020, resulting in a total market value of over USD30 billion in nominal terms.

Desirability:

No	Description	Yes/No
1	Does the proposed land use / development fit the surrounding area?	Yes
2	Does the proposed land use / development conform to the relevant structure plans, SDF and planning visions for the area?	Yes
3	Will the benefits of the proposed land use / development outweigh the negative impacts of it?	Yes
4	Will the proposed land use / development impact on the sense of place?	Yes
5	Will the proposed land use / development set a precedent?	No
6	Will any person's rights be affected by the proposed land use / development?	Yes
7	Will the proposed land use / development compromise the "urban edge"?	No

Benefits:

No	Description	Yes/No
1	Will the land use / development have any benefits for society in general?	Yes
2	Will the land use / development have any benefits for the local communities where it will be located?	Yes

g) Motivation for the preferred development footprint within the approved site including a full description of the process followed to reach the proposed development footprint within the approved site

NB!! – This section is about the determination of the specific site layout and the location of infrastructure and activities on site, having taken into consideration the issues raised by interested and affected parties, and the consideration of alternatives to the initially proposed site layout.

This section converses the determination of the specific site layout having taken into consideration the comparison of the originally proposed site plan, the comparison of that plan with the plan of environmental features and current land uses, the issues raised by interested and affected parties, and the consideration of alternatives to the initially proposed site layout as a result.

i) Details of the development footprint alternatives considered

With reference to the site plan provided as Figure 2 and the location of the individual activities on site, provide details of the alternatives considered with respect to:

(a) the property on which or location where it is proposed to undertake the activity;
(b) the type of activity to be undertaken;
(c) the design or layout of the activity;
(d) the technology to be used in the activity;
(e) the operational aspects of the activity; and
(f) the option of not implementing the activity.

(a) The property on which or location where it is proposed to undertake the activity:

- PORTION 6 (EMIL – A PORTION OF PORTION 3 (ONVERWAG)) OF THE FARM ELANDS DRIFT 159, BARKLY-WES
- REMAINING EXTENT OF PORTION 1 OF THE FARM SLANGHEUVEL 160, BARKLY-WES

Alternatives considered: -

No planned alternative to proposed prospecting is envisaged. Should prospecting not proceed the current agricultural land use will continue. Proposed site layout and opencast mining with concurrent rehabilitation where possible will minimise footprint and impact. Any alternative methodology may have greater impact. Alternatives may be looked at in more detail within the Scoping, EIA EMP Report.

The only other alternative would be not to continue with the operation.

(a) The type of activity to be undertaken:

The consideration of alternatives is a critical component of the EIA process, where an appropriate range of alternatives require consideration whilst achieving the desired objective of the proposed project. In order to ensure that the proposed development enables sustainable development, a number of feasible options must be explored. The various alternatives were assessed in terms of logistical practicality, environmental acceptability and economic feasibility. Alternatives for the locality the prospecting operation do not form part of the discussion as the location of the prospecting operation is determined by the geological location of the mineral resource (as discussed in section f).

Land Use

Dr. Betsie Milne from Boscia Ecological Consultants has been appointed by Bokamoso Exploration (Pty) Ltd to provide an ecological study in order to highlight the ecological characteristics of the proposed mining area and to determine the possible impact of mining on the diversity and ecological status of the application area. Land use was described and included in this report as part of the ecological study.

Currently, the major land uses in the area are mining and agriculture. According to AGIS, the land capability for the study site is non-arable with moderate potential for grazing and wildlife. The grazing capacity is 12 ha/LSU, with the agricultural region being demarcated for cattle farming. The study area also falls within the North western cattle and game ranching Livelihood Zone, with sections along the river overlapping with the Vaal-Harts irrigated crops Zone.

The study area is mainly used as natural pastures for livestock grazing, but there are also a few irrigated crops. Existing infrastructure includes homesteads, a public gravel road, farm roads and tracks, grazing camps, and Eskom powerlines. Evidence of extensive disturbances from historic mining activities are also present. The remaining areas are still in pristine condition and used for natural pastures.

Project Infrastructure

Alternatives and considerations pertaining to the project infrastructure were discussed in section g.

Prospecting Method

The Prospecting method of drilling and open pits and trenches with continued backfilling is the only economic viable method currently being used by the diamond fraternity. There is no alternative prospecting method for the prospecting of diamonds.

Proceed without the Mine (no go)

Land Use

The current land use is agriculture and grazing. If the prospecting operation does not continue, the grazing capacity and agriculture will continue. Water will be sourced from the Vaal river. The propecting operation will not abstract any underground water.

Socio-Economy

The operation will make provision for 15 - 25 job opportunities. This will be lost if the project does not proceed. Substantial tax benefits to the state and local government will also be lost.

Biodiversity

The proposed prospecting site falls partially within critical biodiversity areas, as defined by the Northern Cape Critical Biodiversity Areas Map (Holness and Oosthuysen 2016). This map identifies biodiversity priority areas, called Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs), which, together with protected areas, are important for the persistence of a viable representative sample of all ecosystem types and species as well as the long-term ecological functioning of the landscape. The Vaal River is classified as Critical Biodiversity Area One, with its associated buffer- and catchment areas classified as Ecological Support Areas. Most of the earmarked area is however classified as Other Natural Areas, which does not constitute any specific biodiversity priorities. No Critical Biodiversity Area Two or Protected Areas occur in the study area.

The implementation of the prospecting operation will have a potential impact on the biodiversity through removal of indigenous vegetation and destruction of habitats. If no prospecting activities were to continue, the status quo would apply and no damage would accrue to the environment.

Heritage and Cultural Resources

In the event that the prospecting operation does not proceed, the heritage resources will remain as is. The protection and preservation of these resources

are therefore not guaranteed. However, if the prospecting operation is approved, the heritage resources will be protected through the demarcation of no-go zones and fencing off if any of these resources are encountered.

(b) The design or layout of the activity:

The site infrastructure will need to be strategically placed by incorporating prospecting project demands and environmental sensitivities identified during the Environmental Impact Assessment process. Thus, the site layout will primarily be based on proximity to the nearby access roads, proximity to the areas earmarked for bulk sampling as well as limited additional impact on the environmental (non-perrennial drainage lines and wind direction), heritage resources and discussions with the relevant land owners and Departments.

The following infrastructure will be established and will be associated with the prospecting operation:

- the electricity needs for the operations will be generated by a diesel generator and there would therefore be no additional pressure on the Eskom Electricity Grid.

In terms of sewage the decision was made to use chemical toilets which can be serviced regularly by the service provider.

(c) The technology to be used in the activity:

- Technique

The area will be excavated (opencast method) with an excavator up to bedrock, stockpiled next to an open area and loaded onto the trucks by a frond end loader. The trucks will transport the gravel via a newly constructed road, which will be constructed to the required safety standard. No provincial roads will be used.

At the processing plant the run of mine tailings will be fed onto a grizzly for the screening out oversize material. The gravel will be processed through a screening process and transported for delivery to a recovery plant and associated equipment.

- Technology

At the processing plant the run of mine tailings will be fed onto a grizzly for the screening out oversize material. The gravel will be processed through a screening process and transported for delivery to a recovery plant and associated equipment.

Alternatives considered:-

The planned prospecting activities include (bulk sampling) with an excavator up to bedrock. The operation is also associated with processing techniques that make use of modern technologies. These are the most economic viable method currently being used by the diamond fraternity. There is no other feasible,

alternative prospecting method for the bulk sampling of possible alluvial diamonds.

(d) The operational aspects of the activity:

The gravels will be loaded with an excavator on to dump trucks for conveyance to the Processing Plant. At the Processing Plant the bulk sample gravels will be fed onto a grizzly for screening out oversize material. The tailings will be processed through a screening section and transported for delivery to a recovery plant. Concentrate from the recovery plant will be processed through an X-Ray/Sortex plant to extract possible diamonds.

Prospecting activities will primarily make use of existing roads, but additional roads will most likely be created.

Alternatives considered: -

The conventional opencast load-haul-bulk sampling method has been proven to be the most economic viable method currently being used by the diamond fraternity. There is no other feasible, alternative bulk sampling method for the prospecting and extraction of possible general and alluvial diamonds.

(e) The option of not implementing the activity:

Currently, the major land uses in the area are mining and agriculture. According to AGIS, the land capability for the study site is non-arable with moderate potential for grazing and wildlife. The grazing capacity is 12 ha/LSU, with the agricultural region being demarcated for cattle farming. The study area also falls within the North western cattle and game ranching Livelihood Zone, with sections along the river overlapping with the Vaal-Harts irrigated crops Zone. Therefore, prospecting activities can also be a economically beneficial option for the area to establish any potential for mineral resources. No agricultural lands will be disturbed.

Socio-Economy

The operation will make provision for 12 - 25 job opportunities. This will be lost if the project does not proceed. Substantial tax benefits to the State and Local Government will also be lost.

Biodiversity

The area lies in veld type 32, Kalahari Plains Thorn Bushveld, as described by Low and Rebelo (1996). Three veld types can be defined, namely the *Acacia tortilis* (Umbrella Thorn) savannah, the camphor bush ("vaalbos") shrub veld and the mixed Blackthorn/Camphor bush/Raisin bush shrub veld (DE Wet, 2002).

No endangered species or rare plants were recorded in the Prospecting area. The protected bontaalwyn (Aloe grandidentata) is common and fairly

widespread. It is therefore not considered practical to replant the individuals present in the areas to be mined.

A number of species recorded on site are potential invaders, but these are all indigenous and occur wide-spread in the Northern Cape.

The Bitter apple, Scottish Thistle and "Jan Twak", although exotics, occur generally as weeds in the Northern Cape and mechanical control before seeding is recommended to reduce their threat of spreading. These species will also be the first to invade disturbed areas such as the rehabilitated areas and their mechanical removal is recommended.

Heritage and Cultural Resources

1. A Heritage Impact Assessment (HIA) study has been conducted on behalf of Bokamoso Exploration (Pty) Ltd to support a mine prospecting rights application on Portion 6 of the Farm Elandsdrift 159 and the Remaining Extent of Portion 1 of the Farm Slangheuvel 160, near Barkly West in the Dikgatlong Local Municipality, Northern Cape Province. A ground survey was conducted on 9th and 10th June 2021 for the possible occurrence of archaeological and historical material on the property.

2. The heritage sensitivity of the property is summarised as follows:

3. The Stone Age
   A few stone tools were found. The occurrence of a cleaver (BMK08) shows the Early Stone Age origins of the stone tool cultures which became well established in subsequent epochs of the Stone Age, i.e. the Middle and Late State Age. None of the finds warrants further action.

4. The Iron Age
   No material dating to the Iron Age was found.

5. Historic buildings
   There are a number of buildings of different typologies on the property. Together they constitute the built environment typical of many farms in the broader area. Increasingly this is being recognised as a cultural landscape of heritage significance. The circular fields under pivot irrigation add another key element to the landscape as they are a common occurrence on the silt banks of the Vaal and Orange Rivers. None of buildings will be affected by the prospecting and mining operations.

6. Burial grounds
   Two burial grounds were recorded (BMK04, BMK13). It is recommended that the burial grounds are fenced off and 100 m buffer reserved in accordance with SAHRA minimum standards. If operations will encroach into the buffer area, a permit must be obtained from SAHRA.

Should any other heritage features and/or objects be located or observed, a heritage specialist will be contacted immediately. Observed or located

heritage features and/or objects may not be disturbed or removed in any way until such time that a heritage specialist has been able to make an assessment as to the significance of the site (or material) in question. If the prospecting operation is approved, the heritage resources that had been encountered will be protected through the demarcation of no-go zones and fencing off.

ii) Details of the Public Participation Process Followed

Describe the process undertaken to consult interested and affected parties including public meetings and one on one consultation. NB the affected parties must be specifically consulted regardless of whether or not they attended public meetings. (Information to be provided to affected parties must include sufficient detail of the intended operation to enable them to assess what impact the activities will have on them or on the use of their land.

The process as described by NEMA for Environmental Authorisation was followed. See table 3 for the identification of Interested and Affected Parties to be consulted with. The landowner, and or occupants and direct neighbours were consulted. The landowners and neighbours were consulted with a registered letter informing them that the application had been accepted and a Basic Information Document (BID) were attached in which all activities were explained.

An Advert (Notice) was placed in the DFA on 28 August 2020 to notify all other interested and affected parties.

Registered consultation letters were sent on 09 September 2020 to all identified parties and government departments with a BID (Background Information Document) document attached.

The Scoping Report was put on disc and was distributed to all the registered parties per registered mail on 10 September 2020.

The EIA EMP report was put on disc and distributed to all registered parties per registered mail on 04 August 2021.

The document will also be made available at the public library in Barkly West, if possible, otherwise the document will be put in the Kimberley library.

The document can also be viewed at the EAP address with prior arrangement to view the document.

iii) Summary of issues raised by I&APs

(Complete the table summarising comments and issues raised, and reaction to those responses)

Table 3: Summary of issued raised by I&Aps

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted		Date Comments Received	Issues Raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated
AFFECTED PARTIES					
Landowner/s	**X**				
TRADEQUICK 1090 CC PO Box 365 Barkly-Wes 8375 bondfarming@mweb.co.za	X				
Lawful occupier/s of the land					
Landowners or lawful occupiers on adjacent properties	**X**				
Wilhelm Groenewald By Hand	X				
Brad Potgieter P.O. Box 110045 Hadisonpark Kimberley 8306	X				
Derek Corns KIMBERLEY DIAMOND EXCHANGE 76 - 78 QUINN STREET KIMBERLEY 8301	X				
Municipal Councillor	**X**				
Municipality	**X**				
Dikgatlong Municipality	X				

The Mayor and the Municipal Manager Private Bag X 5 Barkly-Wes 8375					
Frances Baard District Municipality Private Bag X6088 Kimberley 8300	X				
Organs of State (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA					
ESKOM Environmental Division P O Box 356 Bloemfontein 9300 Ms A van Gensen	X	4 December 2020 1 December 2020	Registered letter returned by Post Office		
ESKOM Holdings SOC Limited Northern Cape Operating Unit: Land Development PO Box 606 Kimberley 8300	X	04 November 2020	This notice affects the existing Eskom Distribution's power lines, Riverton/North River Farmers1 11kV Overhead Line and Riverton/Slypklip 1 66kV Overhead Line which traverses the proposed mining area. The approximate positions of these services are indicated on the attached locality Map.	Indemnity returned to ESKOM on 5 November 2021	

			Eskom Distribution will raise no objection to the proposed Mining operations on the above mentioned properties provided Eskom's rights and services are acknowledged and respected at all times. Eskom's rights are protected by Wayleave Agreements and Servitudes. The approximate positions of these services are indicated on the attached sketches. Further to the above the following conditions must be adhered to and accepted in writing before any development and or construction: A.1 Access and egress Eskom shall at all times retain unobstructed access to and egress from its servitudes and services. A.2 Approvals A.2.1 Eskom's consent doesn't relieve the applicant from obtaining		

			the necessary statutory, land owner or municipal approvals. A.2.2 The applicant will adhere to all relevant environmental legislation. Any cost incurred by Eskom as a result of non-compliance will be charged to the applicant. A.3 Eskom Cables Eskom's underground cables affected must be placed in sleeves encased in concrete across the width of the servitude, at the applicant's expense. Materials to be used and relevant dimensions shall be determined as required. A.4 Dimensions No construction or excavation work shall be executed within 11 metres from any Eskom power line structure, and/or within 11 metres from any stay wire. A.5 Earthing		

			All work within Eskom's servitude areas shall comply with the relevant Eskom standards in force at the time. A.6 Expenditure If Eskom has to incur any expenditure in order to comply with statutory clearances or other regulations as a result of the applicant's activities or because of the presence of his equipment or installation within the servitude or wayleave area, the applicant shall pay such costs to Eskom on demand. A.7 Ground level variations Changes in ground level may not infringe statutory ground to conductor clearances or statutory visibility clearances. After any changes in ground level, the surface shall be rehabilitated and stabilised so as to prevent erosion. The measures taken shall be		

			to Eskom's requirements. A.8 Indemnity Eskom shall not be liable for the death of or injury to any person or for the loss of or damage to any property whether as a result of the encroachment or of the use of the servitude area by the applicant, his/her agent, contractors, employees, successors in title, and assigns. The applicant indemnifies Eskom against loss, claims or damages including claims pertaining to consequential damages by third parties and whether as a result of damage to or interruption of or interference with Eskom's services or apparatus or otherwise. Eskom will not be held responsible for damage to the applicant's equipment. The applicant's attention is		

			drawn to the Electricity Act, 1987, (Act 41 of 1987, as amended in 1994), Section 27(3), which stipulates that the applicant can be fined and/or imprisoned as a result of damage to Eskom's apparatus. A.9 Machinery No mechanical equipment, including mechanical excavators or high lifting machinery, shall be used in the vicinity of Eskom's apparatus and/or services, without prior written permission having been granted by Eskom. If such permission is granted the applicant must give at least seven working days prior notice of the commencement of work The Eskom's authorised area representative for the Barkley West CNC: Gerhard Vermeulen 053 531 6602/082 438 8475, email address: VermeuG@eskom.co.za.		

			This allows time for arrangements to be made for supervision and/or precautionary instructions to be issued. A.10 Permission to do work A.10.1 No work shall commence unless Eskom has received the applicant's written acceptance of the conditions specified in the letter of consent and/or permit. A.10.2 Eskom's rights and duties in the servitude shall be accepted as having prior right at all times and shall not be obstructed or interfered with. Note: Where an electrical outage is required, at least fourteen work days is required to arrange same. A.11 Remedial action Under no circumstances shall rubble, earth or other material be		

			dumped within the servitude or Way Leave restriction area. The applicant shall maintain the area concerned to Eskom's satisfaction. The applicant shall be liable to Eskom for the cost of any remedial action which has to be carried out by Eskom. A.12 Safety A.12.1 The clearances between Eskom's live electrical equipment and the proposed construction work shall be observed as stipulated by Regulation 15 of the Electrical Machinery Regulations of the Occupational Health and Safety Act, 1993 (Act 85 of 1993). A.12.2 Equipment shall be regarded electrically live and therefore dangerous at all times. A. 12.3 In spite of the restrictions stipulated by		

			Regulation 15 of the Electrical Machinery Regulations of the Occupational Health and Safety Act, 1993 (Act 85 of 1993), as additional safety precaution, Eskom will not approve the erection of Houses, or structures occupied or frequented by human beings under the power lines and only after consideration of all alternatives, within the servitude area. A. 12.4 Eskom may stipulate any additional requirements to illuminate any possible exposure to Customers or Public to coming into contact or be exposed to any dangers of Eskom plant. A. 12.5 It is required of the applicant to familiarize him/herself with all safety hazards related to Electrical plant. B.1 Blasting, opencast mining and undermining		

			B.1.1 A specific document of permission in respect of the blasting or mining activity as issued by the Inspector of Mines must be submitted to Eskom before commencement of operations. [refer to the Minerals Act, 1991 (Act 50 of 1991) Regulation 9.33.5 – Permission to fire more than one shot hole at a time within 500m from surface structures] B.1.2 Blasting in close proximity to Eskom's overhead power lines or substations is prohibited unless the following precautions are met [refer to the Mine Health and Safety Act, 1996 (Act 29 of 1996) Regulation 17.6(a) - 100m and above a blasting plan submitted with the document of permission referred to in B.1.1 above, a Peak Particle Velocity (PPV) to be kept		

			below 75 mm/s, for lines and 50 mm/s for buildings, a seismic control device is set up to record the readings, ensure fly rock and air blast control by means of adequate matting, in the interest of air blast control, only single shot blasting shall be allowed. Permission for blasting will be strictly as stipulated in the Blasting Design by the Blasting Consultants and blasting should be done away from the power lines. B.1.3 The applicant will be held liable for damage to Eskom's towers or substation equipment, as a result of blasting activities. B.1.4 Costs incurred by Eskom to comply with statutory requirements in terms of an applicant's (or his contractors) works, equipment or plant in the servitude		

			area, shall be paid to Eskom on demand. B.1.5 Eskom may charge the applicant appropriately for time on site during blasting operations. B.1.6 Eskom reserves the right to withdraw its consent if the blasting process becomes hazardous and likely to result in power interruptions. B.1.7 If and whenever the applicant apply and if permission for the blasting process is granted the applicant must give at least fourteen work days prior notice of the commencement of blasting to The Eskom's authorised area representative for Barkley West CNC: Gerhard Vermeulen 053 531 6602/082 438 8475, email address: VermeuG@eskom.co.za This allows time for arrangements to be		

			made for supervision of and/or precautionary instructions to be issued in terms of the blasting operation. B.1.8 General Conditions B.1.8.1 Firing near the power lines should be along a free face, facing away from the power lines, as the Mine has suggested. B.1.8.2 The Mine should prepare a proper analysis of the rock structure and any geological anomalies prior to blasting. B.1.8.3 The "safe distance of 25m" from Eskom pylons should be indicated on the blasting plan. Existing geological faults, decomposed zones and fractured rock structures could have destabilising effects on founding material as a result of the firing, especially when developing an open face next foundations and		

			below founding level. These conditions should be taken into account when deciding on the method and plan of blasting near the Eskom power line pylons. B.1.8.4 Eskom retains the right to appoint any specialist at any time on behalf of the Mine, to inspect Eskom structures for deformation. B.1.8.5 The mining depth near Eskom pylons should carefully be controlled for stability and adjustments being made when so instructed by Eskom. B.1.8.6 Upon receiving the letter of consent from the inspector of the mine to blast below 100m, the applicant must present to Eskom Technical Evaluation Forum L3 the blasting philosophy for final approval. Should the applicant or his contractor damage any of Eskom services		

			during commencement of any work whatsoever, then Eskom's 24-hour Contact Centre Tel: 08600 37566 must be dialled immediately to report the incident. Any relocation of Eskom's services, due to this undermining, will be for the account of the Applicant. The Applicant will also be responsible for granting Eskom an alternative route for the power line. The Eskom Customer Contact Centre at 08600 37566 must be contacted in connection with any line deviation and costs.		
SANRAL PO Box 415 Pretoria 0001	X	2 October 2020	Registered letter returned by Post Office		
Transnet PO Box 72501 Parkview 2122	X				
NC Department of Roads and Public Works PO Box 3132	X				

Squirehill Park Kimberley 8300					
Communities					
No Communities					
Dept. Land Affairs					
Department of Agriculture, Land Reform and Rural Development P O Box 5018 Kimberley 8300	X	3 November 2020 6 November 2020	Registered letter returned by Post Office.		
Department of Rural Development and Land Reform PO Box 5026 Kimberley 8300	X				
Department of Cooperative Governance, Human Settlements and Traditional Affairs Private Bag X5005 Kimberley 8300	X	6 November 2020	Registered letter returned by Post Office		
Traditional Leaders					
No Traditional Leaders					
Dept. Environmental Affairs					
Northern Cape Department of Environment and Nature Conservation Private Bag X6102 Kimberley 8300	X	5 November 2020	Registered letter returned by Post Office		

Tel: 053 807 7430 Fax: 053 831 3530					
Other Competent Authorities affected					
Department of Water and Sanitation Private Bag X6101 Kimberley 8300	X				
SAHRA P.O. Box 4637 Cape Town 8000	X	18 September 2020 09 October 2020 registered letter returned by Post Office	Drilling and Bulk sampling for Diamonds. Wadala Mining and Consulting (Pty) Ltd has been appointed by Bokomoso Exploration (Pty) Ltd to conduct an Environmental Authorisation Application for proposed prospecting activities on portion 6 (a portion of portion 3 (Onverwag) of the farm Elands Drift 159, and Remaining Extent of portion 1 of the farm Slangheuvel 160, Barkley West, Northern Cape Province (NC 30/5/1/1/2/12563 PR). A draft Scoping Report (DSR) has been submitted in terms of the National Environmental Management Act, 1998 (NEMA) and the 2014 EIA Regulations for activities that trigger the Mineral and Petroleum Resources Development Act, 2002 (MPRDA)(As amended). The proposed prospecting right application area will cover 1 079.1889 ha and will include the drilling of 150 boreholes, 20 trenches (150 m x 100 m x 0.5-7 m deep) and five bulk samples (200 m x 200 m x 0.5-5 m deep). Associated infrastructure will include water distribution	Load case onto SAHRIS 31 August 2020	

			pipelines, clean /return water dam, diesel storage area, access and haul roads, residue deposits, office complexes, temporary workshop facilities, storage facilities, ablution facilities, various stockpiles, waster tanks and waste disposal site. The DSR notes heritage desktop reports are being conducted (see page 103 of the DSR) and will be submitted during the EIA phase of the application. Interim Comment SAHRA notes the pending heritage reports and requests that the following studies be conducted as part of the assessment of the impact to heritage resources: The assessment of heritage resources must comply with section 38(3) of the National Heritage Resources Act, Act 25 of 1999 (NHRA); A field-based assessment of the impact to archaeological resources must be conducted by a qualified archaeologist and the report comply with the SAHRA 2007 Minimum Standards: Archaeological and Palaeontological Components of Impact Assessment Reports (see www.asapa.co.za or Prospecting Right for Diamonds by Bokamoso Exploration (Pty) Ltd with Drilling and Bulk sampling. (NC12563PR) Our Ref: Enquiries: Natasha Higgitt Date: Friday September 18, 2020 Tel: 021 462 4502 Email: nhiggitt@sahra.org.za Page No: 1		

			CaseID: 15440 www.aphp.org.za for a list of qualified archaeologists); The proposed development is located within an area of low to high Palaeontological Sensitivity as per the SAHRIS PalaeoSensitivity map. As such, a desktop Palaeontological Impact Assessment (PIA) must be undertaken by a qualified palaeontologist. The report must comply with the 2012 Minimum Standards: Palaeontological Components of Heritage Impact Assessments (see https://www.palaeosa.org/heritage-practitioners.html for a list of qualified palaeontologists); Any other heritage resources as defined in section 3 of the NHRA that may be impacted, 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 viewscapes must also be assessed. Further comments will be issued upon receipt of the requested heritage reports and the NEMA EA documents inclusive of appendices. Should you have any further queries, please contact the designated official using the case number quoted above in the case header. Yours faithfully Natasha Higgitt Heritage Officer South African Heritage Resources Agency Phillip Hine		

			Manager: Archaeology, Palaeontology and Meteorites Unit Prospecting Right for Diamonds by Bokamoso		
National Dept. of Public Works Private Bag X5002 Kimberley 8300	X	6 November 2020	Registered letter returned by Post Office		
Department of Agriculture, Forestry and Fisheries PO Box 2782 Upington 8800	X				
OTHER AFFECTED PARTIES					
None					
INTERESTED PARTIES					
None					

* Note: The contents of this table have been recorded up to 03 August 2021 as the process of public participation is an ongoing process.

iv) The Environmental attributes associated with the development footprint alternatives (The environmental attributed described must include socio-economic, social, heritage, cultural, geographical, physical and biological aspects)

(1) Baseline Environment

(a) Type of environment affected by the proposed activity

(its current geographical, physical, biological, socio-economic, and cultural character)

- ***GEOLOGY:***

The geology of South Africa (Fig. 9) is extremely varied and spans a period of about 4 billion years (SACS, 1980). The northeast portion of the country is dominated by the granitic rocks and belts of volcanic and sedimentary rocks forming the Archaean Kaapvaal Craton. Much of the rest of the country is covered by Phanerozoic sediments.

The earliest clusters of diamondiferous kimberlites, namely Kuruman and Cullinan, intruded into South Africa during the Proterozoic. The main kimberlitic (both diamondiferous and barren) event took place in the late Mesozoic, however. All the economically viable kimberlites occur on the Kalahari Archon (Kaapvaal and Zimbabwe Cratons), while those occurring in the surrounding Proterozoic basement are non-diamondiferous (Gurney, et al., 1991). Over 2,000 kimberlite pipes, blows and fissures have been recorded across South Africa, Lesotho, Swaziland, Botswana and Zimbabwe, spanning emplacement age range of approximately 1700 – 40 Ma. Kimberlite emplacement was followed by the liberation and entrainment of diamonds and the subsequent deposition of terraces on the ancient Vaal and Orange Rivers.

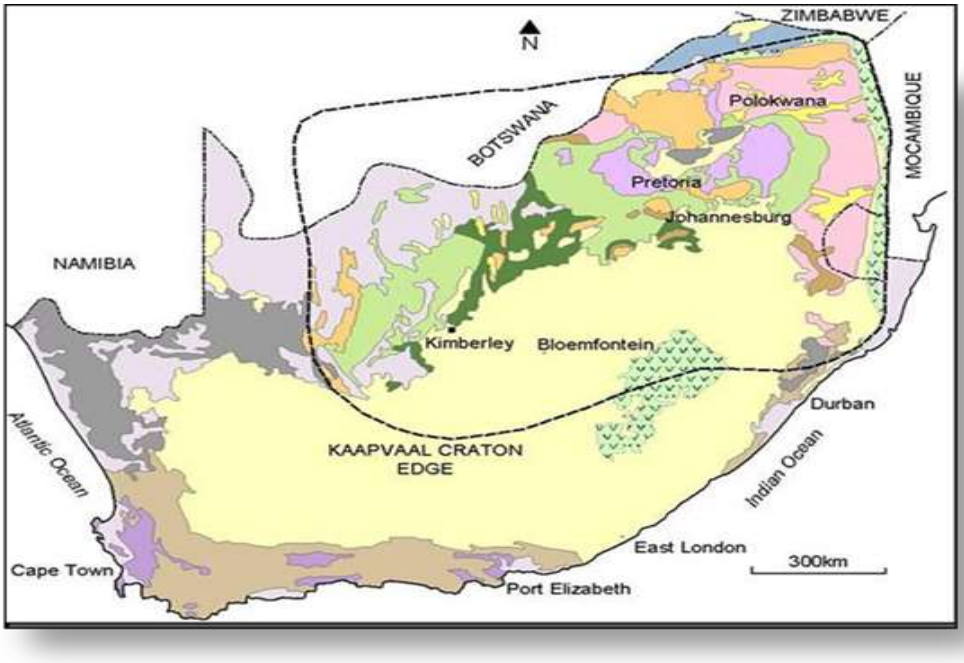


Figure 9. General Geology of South Africa (Gurney, et al., 1991).

The Alluvial Diamond Fields of the Middle Vaal River

The stratigraphy of the middle-lower Vaal River is relatively simple. The bedrock consists of +2,700 million year old Ventersdorp lavas, Transvaal shales and dolomites at +2,300 million years on the Ghaap plateau, further west, as well as younger Dwyka tillites. Overlying these rocks is a series of mostly Cainozoic gravel deposits that have long been mined for their diamond content. Prior to the (Palaeozoic/Mesozoic) Karoo period, the (pre-Karoo) Vaal River cut a network of channels closely approximating the present floodplain (Partridge & Maud, 1987). These channels were later utilised by the Dwyka (continental-type) glaciers and were filled with tillites and shales (at ± 280-250 million years). The post-Karoo Vaal River, subsequently, incised into these formations and deposited gravels and large quantities of fine-grained sediments in numerous cycles ranging from the late Cretaceous to the Holocene.

The terrace exposures in the Windsorton - Delportshoop area are best known for the wealth of diamonds they have produced. Partridge and Brink (1967) and Helgren (1979) recognized several levels of terrace development above the present Vaal River and subdivided the alluvial deposits of the Lower Vaal basin into Older (Nooitgedacht, Holpan, Proksch Koppie and Wedburg) terraces deposits and Younger (Rietputs and Riverton Formations) gravels on the basis of lithological and topographical observations (**Fig. 10**).

Older gravels

The highest and oldest gravels occur between some 80-120m above present river level and include the Nooitgedacht (A0) deposits. These deposits appear to have been deposited in the late Cretaceous. Generally these Older Gravel deposits can be divided into two horizons; the overlying *"Rooikoppie Gravels* (also known as "Red Older Gravels "or "Potato Gravels") and the basal alluvial gravels.

The uncemented *Rooikoppie* Gravels are a weathered and (colluvially) reworked residual of the calcreted basal older gravels (remnants of a pre-existing diamondiferous fluvial alluvial deposit) and, being a concentrate, contained a greater proportion of diamonds and have been almost entirely mined out where they were either outcropping or covered by thin overburden. These *Rooikoppie* deposits are typically 10-20cm thick and consists of uncemented, granular to pebbly, sub-rounded to sub-angular, resistant clasts, composed mainly of quartz, quartzite and agate set in a matrix of dark red, fine to medium sand.

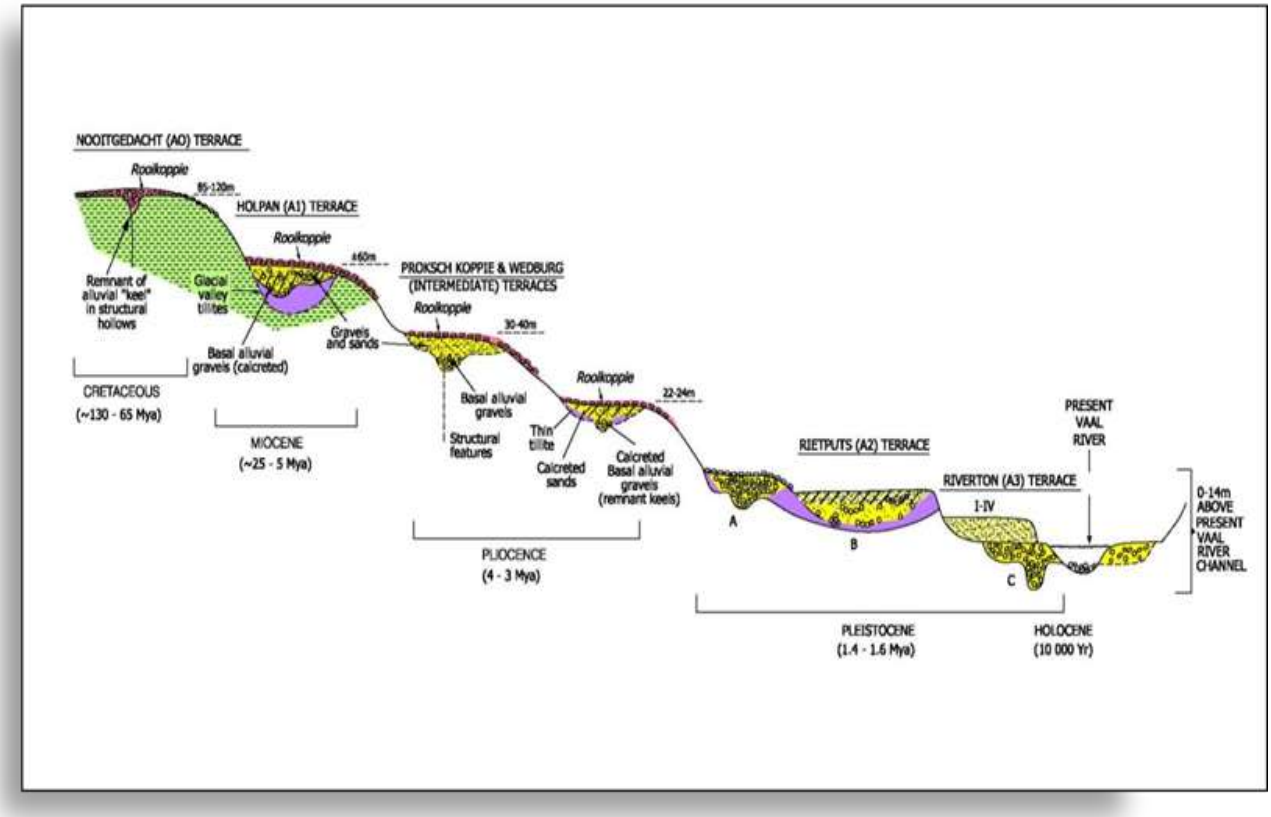


Figure 10. Schematic diagram of the terraces that are present along the middle-lower Vaal River system (Marshall, 2004)

All the larger boulders are of locally derived Ventersdorp lava, which contains large corestones at the base of its weathering profile.

The deposits are laterally very extensive and drape bedrock irregularities with uneven thickness. The gravels are, in turn, overlain by Kalahari Sands. The underlying basal (alluvial) gravels are often preserved in hollows ("sluits") in the Ventersdorp lavas (Spaggiari, 1993).

The next suite of older gravels (Holpan Gravels (A1) consists of well-preserved, variably calcreted, primary fluvial sediments at approximately 60m above present Vaal River level. A large remnant channel meander has been preserved at Windsorton on the farms Klipdam and Holpan. This palaeochannel is between 75m and 400m wide and is covered by 4-12m of calcreted fine-grained fluvial sediments (de Wit et al., 1997) and is characterised by elongate bodies of gravel surrounded by finer grained material, typical of a low energy braided river system. Gravel thickness varies from less than 1m to 8m (with an average of 3.7m). The gravels consist predominantly of well rounded, densely packed, cobble to boulder gravel. The average gravel clast size varies from 50-100mm but lava boulders up to 1m in diameter are present. The matrix contains well rounded pebbles of lava, epidote, banded ironstone, quartzite, agate, quartz and dolerite. In places, the gravels are cemented by calcium carbonate (calcrete). The bedrock consists of Ventersdorp lava with isolated thin remnants of Karoo sediments preserved in depressions. The degree of calcretisation associated with the Holpan gravels is typical of Miocene age gravel deposits throughout much of southern Africa, reflecting the extremely dry prevailing climates.

A veneer of loosely packed, derived (Rooikoppie) gravels flanks the channel. These gravels lie on an irregular but generally planar surface of Ventersdorp lava and Dwyka shale. Overburden, where present, usually consists of a thin layer of soil, windblown Kalahari sand and calcrete, in places. The gravel thicknesses vary from a single layer of pebbles up to deposits of metre scales. Most of the pebbles are chert, agate, quartz, quartzite and banded ironstone and range in size from 5-60mm. The matrix consists of variable proportions of sand and clay.

Older gravels (Intermediate gravels) occur also on the Proksch Koppie terrace (30-45m) and the Wedburg terrace (21-30m), whose remnants are preserved from Windsorton to Delportshoop (Helgren, 1979). These gravel deposits are very similar to those developed on the higher (Nooitgedacht) terrace in that both derived Rooikoppie gravels and underlying remnants of calcreted alluvial gravels are known to exist.

These gravel terraces, however, are less calcified than the 60m (Holpan) terraces, reflecting less arid prevailing climates. The Wedburg deposits have yielded a sparse, poorly provenanced vertebrate fauna representing ages of about 4.5 to 3.5 Ma (Pliocene).

Younger gravels

As the Vaal River continued incising it deposited the Younger Gavels. These alluvial deposits have been subdivided into the Rietputs and Riverton Formations (Cooke, 1949; Butzer et al., 1973). Partridge and Brink (1967) suggested that the Rietputs Formation (A2), which form the +12-14m floodplain terrace, are all part of one formation with three distinct erosional and depositional (or aggradational) units, designated Rietputs A, B and C.

Around Barkly West, Helgren (1979) described four distinct fills in a deposit of similar age which stretches from Gong Gong to Delportshoop and includes the main gravels on Waldeck's Plant, Longlands and Winter's Rush (Matheyss, 1990). Fossil evidence and the presence of Acheulian artefacts indicate that these Rietputs sediments are of Middle Pleistocene age (Partridge and Brink, 1967).

Regional Bedrock Geology

The bedrock of the middle-lower Vaal River valley is dominated by Ventersdorp lavas and sediments of the Transvaal Supergroup. These basal rocks are widely overlain by flat-lying Dwyka tillite and siltstone of the Karoo Supergroup.

The Dwyka, typically, comprises matrix-supported diamictite with both local and transported pebbles and boulders as drop-stones in a rock-flour matrix. The bedrock is cut by faults and dolerite dykes, which are rarely exposed.

Owing to the irregularity of the pre-Dwyka surface, several reaches of the river are superimposed on pre-Dwyka topographic highs, which, due to their relative resistance to erosion, give rise to more rugged topography. Here the Vaal River is confined to gorges with increased river gradients. In contrast, the more easily eroded Dwyka has been dissected by minor tributaries of the Vaal River, giving rise to a trellis-type drainage pattern. Most of the soils in the area are of the Hutton

type and of aeolian origin. In most places these soils are relatively shallow, especially where underlain by calcrete. Two land types occur on the property:

The Ag land type refers to yellow and red soils without water tables and amongst other also Hutton soils. In the Ag- land type the soils are red with a high base status and shallower than 300 mm (MacVicar, 1986). These are soils consist of red to yellow, high-base status apedal, freely drained soils deeper than 300 mm.
The Fc-land type comprises young landscapes that are neither rocky, alluvial nor aeolian. The predominant soil forming processes have been rock weathering, formation of orthic topsoil horizons and, commonly, clay illuviation, giving rise typically to lithocutanic horizons (Land Type Survey Staff, 1986). The Fc-land type is classified as MB5 which means that 90% of the land surface is covered by stones or bedrock (Land Type Survey Staff, 1986).

These Hutton soils are prone to mostly wind erosion, but this is a function of vegetation cover. Surface runoff following an event such as a cloudburst could cause erosion, but these soils are generally of low erodability.

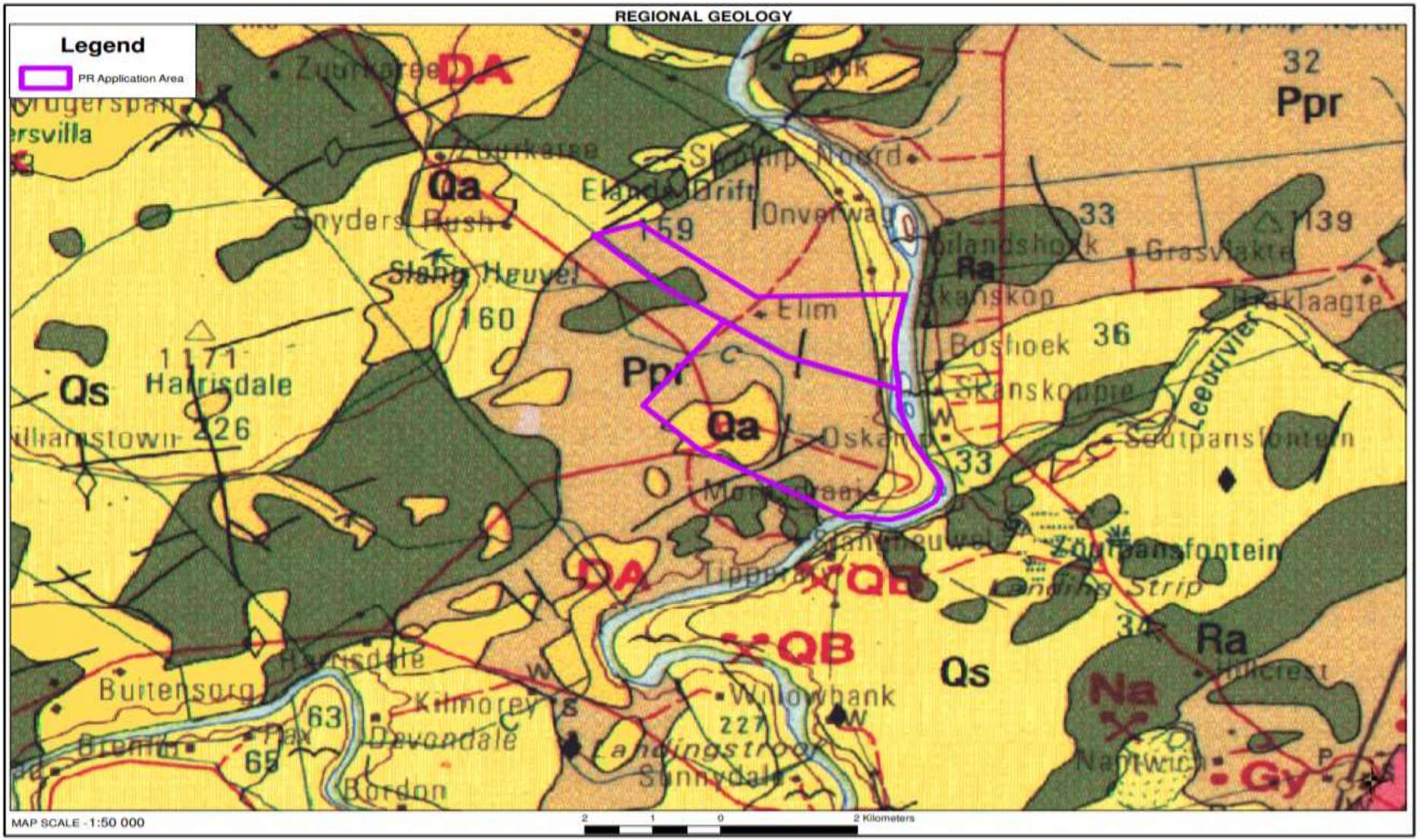


Figure 11. - Extract from 1:250 000 geological map (Council for Geoscience, Pretoria) showing location of the farms Blue (Vgd) = Campbellrand Subgroup comprises of coarse to fine grained dolomite and limestone, Grey (C-Pd) = Dwyka Group, Yellow (T-Qc) = Neogene calcrete, Pale yellow (Qs) = Quaternary to Recent sands and sandy soil of the Gordonia Formation (Kalahari Group). DK marks Diamond in Kimberlite.

- ***CLIMATE:***

The mine is located in a semi-arid region, receiving on average about 250 mm of rain in the west to 500 mm on its eastern boundary. The rainfall is largely due to showers and thunderstorms falling in the summer months October to March. The peak of the rainy season is normally March or February. The summers are very hot with cool winters. The nearest weather station to the mine is at Douglas but due to the limited range of information available from this station and the number of periods with broken records, the data from the weather stations at Kimberley will also be used.

Rainfall

Average monthly and annual rainfall for the site and number of days per month with measurable precipitation is presented in the table below:

MONTH	60 MINUTES	24 HOURS	24 HOURS IN 50 YEARS	24 HOURS IN 100 YEARS
January	35.8	57	65.1	73.8
February	70.1	82	58.9	66.5
March	63.7	67.8	72.1	81.4
April	25.7	51.6	65.9	75.2
May	14.6	54.6	36.8	42.4
June	19.1	67.5	26	30.4
July	12	26.7	26.6	31
August	17	58.2	23.4	27.3
September	16.3	26.7	24.1	28
October	37.6	59.2	53.8	61.8
November	25.2	60.1	41.2	46.7
December	59.9	64.5	70.7	80.9

Source: Directorate: Climatology South African Weather Bureau – Station 0290468:- Kimberley 1970 – 2003

Temperature

The average monthly maximum and minimum temperatures are presented in the table below:

MONTH	DAILY MAXIMUM ®C	DAILY MINIMUM ®C
January	32.8	17.9
February	31	17.3
March	28.8	15.2
April	24.8	10.9
May	21.4	6.5
June	18.2	3.2
July	18.8	2.8
August	21.3	4.9
September	25.5	8.9
October	27.8	11.9
November	30.2	14.6
December	32.1	16.6
YEAR	**26.1**	**10.9**

Source: Directorate: Climatology South African Weather Bureau © 2000 – Station 0290468:- Kimberley 1960 – 2000

Wind

The prevailing wind direction for the area is north to north-north-west for the months of January to September and changing from north to sometimes westerly winds during October to December averaging 3.5 m/s (Kimberley 01/01/1990 – 31/08/200, Station 0290468).

Humidity and evaporation

The average monthly humidity is presented in the table below:

MONTH	AVERAGE (%)	MAXIMUM (%)	MINIMUM (%)
January	47	91	8
February	54	94	12
March	57	96	15
April	60	96	16
May	56	96	16
June	54	97	15
July	49	97	13
August	42	94	10
September	36	91	8
October	39	89	8
November	42	92	8
December	43	90	7
YEAR	**48**	**94**	**11**

Source: Directorate: Climatology South African Weather Bureau © – Station 0290468:- Kimberley 1960 – 2000

The average monthly evaporation is presented in the table below:

MONTH	EVAPORATION IN mm
SYMONSPAN	
January	365.6
February	279.1
March	235.8
April	169.1
May	135.1
June	108.6
July	130.1
August	181.2
September	252.6
October	314.8
November	345.5
December	378.6
YEAR	**2896**

Source: South African Weather Bureau – Station 0290468:- Kimberley 1957 – 1987

Incidents of Extreme Weather Conditions

- **Hail**

  Hail is sometimes associated with thunderstorms and mainly occurs in early to late summer (November to February). It occurs on average three times a year and although these storms may sometimes be severe and cause much damage, they usually impact on a relatively small area.

- **Frost**
  The period during which frost can be expected lasts for about 120 days (May to August). With extreme minimum temperatures to below -8°C at night in the winter, frost development can be severe.
- **Droughts**
  Droughts are common and may vary from mild to severe. During these periods dust storms sometimes occur, depending mainly on denudation of the surface.
- **Wind**
  High winds are unusual but when the do occur can uproot trees and take off roofs.

- ***TOPOGRAPHY:***

Dr Elizabeth (Betsie) Milne has been appointed by Wadala Mining to provide an ecological study in order to highlight the ecological characteristics of the proposed prospecting area, and to determine the possible impact of prospecting on the diversity and ecological status of the application area topography was described and included in this report as part of the ecological study (Appendix 4).

The entire site is characterised by level plains with some relief. Altitude ranges from 1 110 m above sea level along the floodplains of the Vaal River in the west to 1 140 m on the calcrete terraces in the west. The terrain is indicated by a level to very gentle slope of <2 %, but some areas do however have slightly steeper slopes (3 – 5) % and these are especially prominent where sharper ridges occur along the terraces.

- ***SOILS:***

Dr Elizabeth (Betsie) Milne has been appointed by Wadala Mining to provide an ecological study in order to highlight the ecological characteristics of the proposed prospecting area, and to determine the possible impact of prospecting on the diversity and ecological status of the application area, soil was described and included in this report as part of the Ecological study (Appendix 4).

The prominent land type found on the property is Ae44 (Figure 13), with the river channel being depicted by terrain unit 5 and the younger and older alluvial terraces associated with terrain units 4 and 3, respectively.

The site is characterised by red to yellow apedal, freely drained soils, red with high base status.

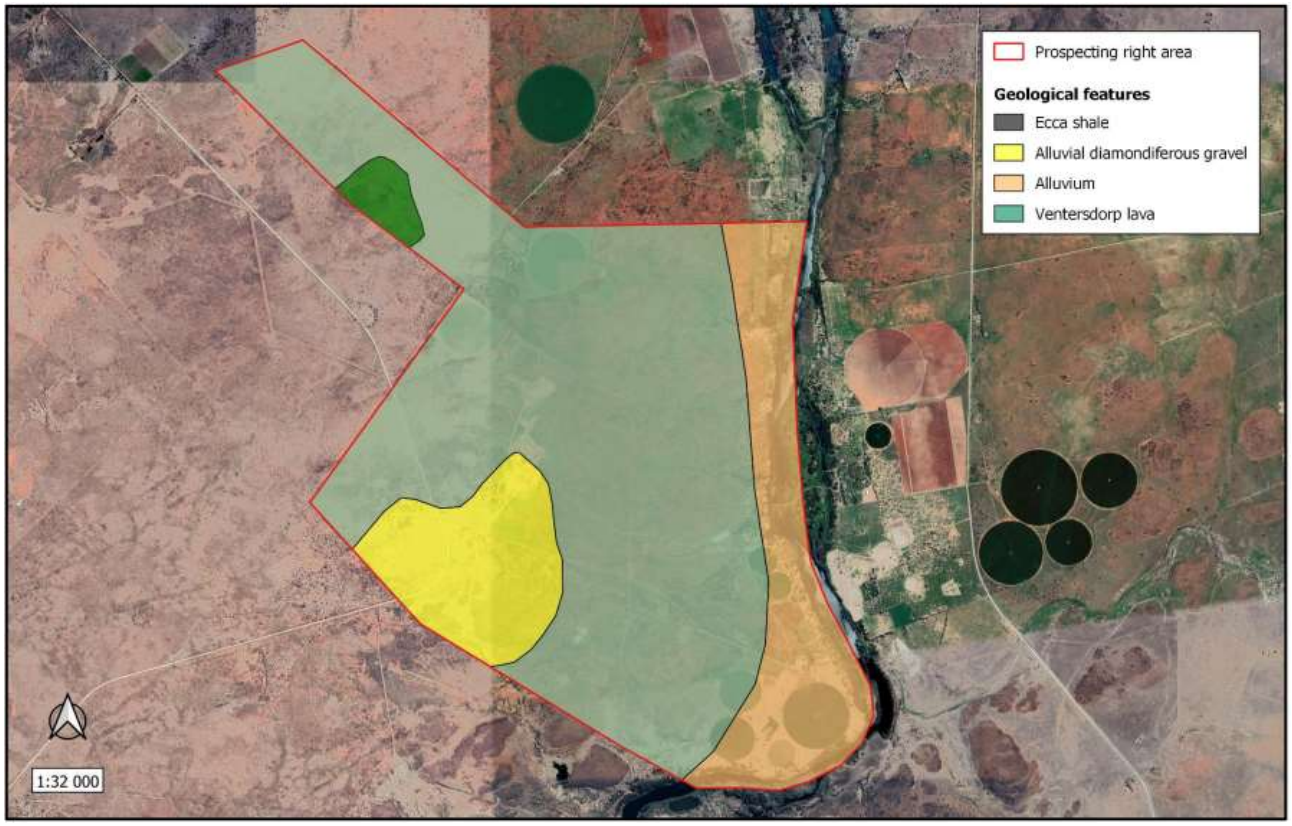


Figure 12. The distribution of land types at the study site. (Map taken out of the Ecological study by Dr. B Milne).

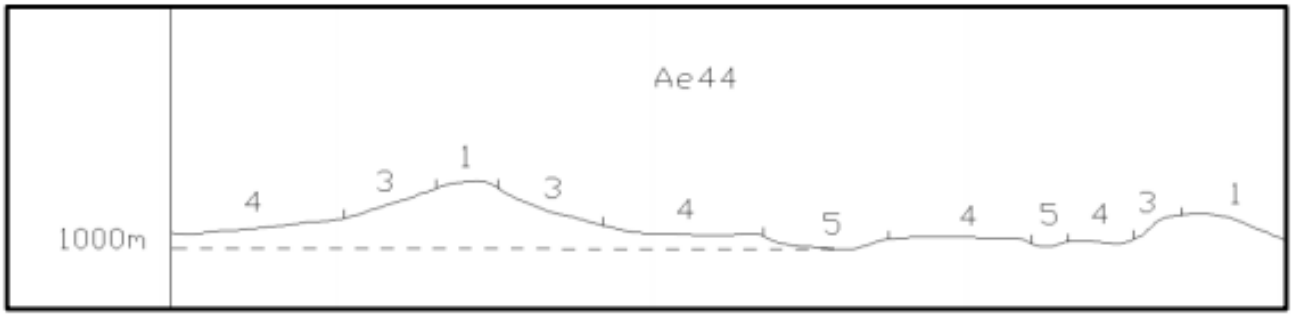


Figure 13. The prominent land type in the study area.

The soils are more than 300 mm deep, and no dunes are present in the landscape. The soils are expected to be dominated by loamy sand. The soils are considered favourable for arable land use if the climate permits.

The soils associated with the study area have low to moderate erodibility. Sand is present, which makes the area susceptible to wind erosion risks, especially in disturbed areas. Rainfall erosivity is very low due to the arid climate and gentle slopes of the study area, but the alluvial soils are most susceptible to water erosion during storm events. Sediment delivery potential is very low and therefore the soils also have a very low potential to regenerate, if badly eroded.The soils are more than 300 mm deep, and no dunes are present in the landscape. The soils are expected to be dominated by loamy sand. The soils are considered favourable for arable land use if the climate permits.

- ***LAND CAPABILITY AND LAND USE:***

Dr Elizabeth (Betsie) Milne has been appointed by Wadala Mining to provide an ecological study in order to highlight the ecological characteristics of the proposed prospecting area, and to determine the possible impact of prospecting on the diversity and ecological status of the application area land capability and land use was described and included in this report as part of the ecological study. (Appendix 4)

Currently, the major land uses in the area are mining and agriculture. According to AGIS, the land capability for the study site is non-arable with moderate potential for grazing and wildlife. The grazing capacity is 12 ha/LSU, with the agricultural region being demarcated for cattle farming. The study area also falls within the North western cattle and game ranching Livelihood Zone, with sections along the river overlapping with the Vaal-Harts irrigated crops Zone.

Land Use before Prospecting

The study area is mainly used as natural pastures for livestock grazing, but there are also a few irrigated crops.

Evidence of Disturbance

Old timers mining activities have caused a degree of disturbance in the area. The disturbed areas include those areas that have been subjected to historic mining activities and are primarily found in the south-west of the study area

Existing Structures

Existing infrastructure includes homesteads, a public gravel road, farm roads and tracks, grazing camps, and Eskom powerlines (Figure 14). Evidence of extensive disturbances from historic mining activities are also present. The remaining areas are still in pristine condition and used for natural pastures.

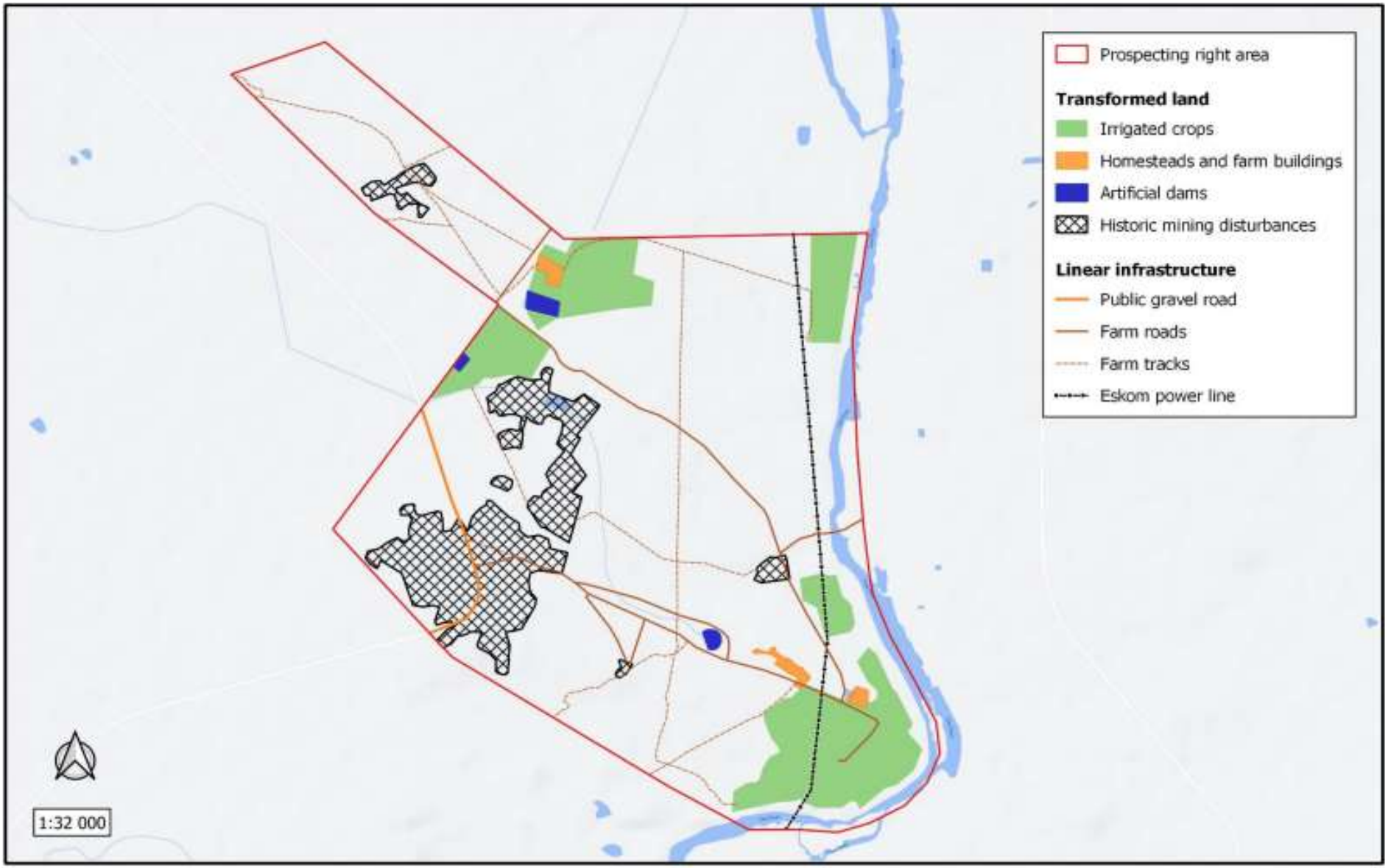


Figure 14. Evidence of existing infrastructure and past disturbances in the study area.

- ***NATURAL FAUNA:***

Dr Elizabeth (Betsie) Milne has been appointed by Wadala Mining to provide an ecological study in order to highlight the ecological characteristics of the proposed prospecting area, and to determine the possible impact of prospecting on the diversity and ecological status of the application area natural fauna was described and included in this report as part of the ecological study. (Appendix 4).

According to Section 3(a) and 4(a) of the Northern Cape Nature Conservation (NCNCA) Act No. 9 of 2009, no person may, without a permit by any means hunt, kill, poison, capture, disturb, or injure any protected (Schedule 2) or specially protected (Schedule 1) wild animals. Furthermore, Section 12 (1) of NCNCA states that no person may, on a land of which he or she is not the owner, hunt a wild animal without the written permission from the landowner. According to the act "wild animal" means a live vertebrate or invertebrate animal, and the egg or spawn of such animal.

The landscape features on the Bokamoso site provide diverse habitat opportunities to faunal communities, specifically at a micro-scale. Animals likely to be found in the study area are discussed in their respective faunal groups below.

Mammals As many as 59 terrestrial mammals and nine bat species have been recorded in the region. Eleven listed terrestrial mammal species and four listed bat species from the region are listed either in the IUCN or South African Red Data Book. Virtually all mammals of the study area are protected; either according to Schedule 1, 2 or 3 of NCNCA. Aardvark and Bushveld Gerbil have a high probability to occur on site, especially in the sandy areas of the grassland and open shrubland. The African Straw-coloured Fruit-bat, Geoffroy's Horseshoe Bat, Honey Badger, African Striped Weasel, Aardwolf, African Wild Cat, Bat-eared Fox, and Striped Polecat have a high chance of occurring across the site, given their wide habitat tolerances. The Dent's Horseshoe Bat, Darling's Horseshoe Bat, Cape Fox and Lesser Dwarf Shrew also have a high chance to be found on site due to their preference for either savanna or grassy habitats. The Cape Clawless Otter and Spotted-necked Otter has a high potential to occur along the Vaal River.

The South African Hedgehog, Ground Pangolin and Black-footed cat may potentially occur on site on account of their preferences for semi-arid areas. They are however inconspicuous and therefore they will most likely be found very seldomly. Brown Hyaena has a low potential to be found on site mainly since farm fences are restricting their occurrences across their

natural distribution range. Sclater's Golden Mole also has a low chance to be found on site due to their affinity for high-altitude grasslands.

Problem animals (Schedule 4) with a high likelihood to occur on site include Vervet Monkey, Black-backed Jackal, and Caracal.

Reptiles

The prospecting right area lies within the distribution range of at least 55 reptile species. No listed species are known to occur in the area, but most reptiles of the study area are protected either according to Schedule 1 or 2 of NCNCA.

Specially protected species include Karusasaurus polyzonus (Southern Karusa Lizard) and Chamaeleo dilepis dilepis (Namaqua Chamaeleon). The Karusa Lizard is a rock-dwelling species inhabiting rocky outcrops, while the Common Flap-neck Chameleon is typically found high up in bushes or trees. South African endemics include Pachydactylus mariquensis (Common Banded Gecko), Agama aculeata distanti (Eastern Ground Agama) and Homopus femoralis (Greater Dwarf Tortoise). The Common Banded Gecko prefers sandy soil and sparse vegetation in a variety of habitats such as sandy plains and dry riverbeds. The Eastern Ground Agama is primarily associated to grassland and woodland habitat but is sometimes also found in rocky areas, while the Greater Dwarf Tortoise occurs in rocky areas with dense vegetation where they take shelter among rocks or under plants. The artificial dams could potentially provide opportunistic habitat for the Marsh Terrapin.

Amphibians

Six amphibian species are known from the region. Frog diversity is expected to increase within the aquatic and wetland ecosystems of the Vaal River and artificial dams, while those species which are independent of water are likely to be common in the area further west of the river. Here they are expected to take refuge under rocks, in soil cracks,
sandy substrates, leaf litter and abandoned termite mounds. None of the frog species from the study region are listed or endemic, but they are all protected according to Schedule 2 of NCNCA.

Avifauna

The study site does not fall within any of the Important Bird Areas (IBA) defined by Birdlife South Africa but lies near (< 50km) fourIBAs(Figure 15); i.e., Spitskop Dam (35 km), Dronfield (15 km), Kamfers Dam (21 km) and Benfontein (40 km).

Spitskop Dam is one of the largest wetlands in the Northern Cape region and holds water permanently, providing a vital habitat when many temporary wetlands have dried up. It is an important habitat for the

Greater- and Lesser Flamingo, Chestnut-banded Plover, Caspian Tern, Pink-backed Pelican and Yellow-billed Stork. One of the most important threats is the poor water quality of the dam fed by the Hart River. The water quality of the latter deteriorates due to irrigation return flows with increasing concentrations of sodium, magnesium, chloride, sulphate and nutrients. Releases from Spitskop Dam could also impact on the quality of the Vaal River. Other important threats to Spitskop Dam include the hunting or poaching of waterbirds, fishing activities and livestock grazing and trampling. The dam edges are threatened by the common reed, the dominance of which reduces the foraging area for flamingos and waders that prefer open shoreline. Dronfield supports large numbers of breeding White-backed Vulture, which comprises 41 % of the breeding pairs in the Kimberley region. These birds forage over wide areas and a pair was encountered soaring over the study area during the site visit. The use of poisons in farming areas to combat mammalian predators still poses a threat to scavenging raptors, and hundreds of vultures can be killed in a single poisoning incident. Collisions with transmission power lines and electrocutions on reticulation and distribution power lines also pose an ongoing threat to vultures and other trigger species.

Kamfersdam is an endorheic pan that has been transformed into a permanent wetland over the past decade due to an increase in sewage effluent inflow. Hence, it has become an important habitat for birds, especially the Greater- and Lesser Flamingos. The dam supports the largest permanent population of Lesser Flamingos in southern Africa. The most significant threats to Kamfersdam are poor water quality, flooding and expansion of urban development, while threats to the bird population include illegal hunting of water birds and the collisions and mortality of flamingos and other water birds caused by power lines and the electrical transmission lines along the railway.

Benfontein is a Nature Reserve owned by De Beers Consolidated Mines since 1891 and there has been significant investment by research groups over the years. It lies 32 km south-west of Olievenput and supports small numbers of breeding White-backed Vulture, Blue Crane and Blue Korhaan. Benfontein also holds several biome-restricted assemblage species and congregatory species, including Lesser Flamingo. More than 1 700 water birds from 65 species have been recorded during years of high rainfall on the ephemeral pan. There are presently few threats to this IBA as it is being well conserved. The invasive Prosopis glandulosa in the north-eastern, spreading along the N8 on the eastern boundary, could become a significant threat if not controlled. Collisions with the power line transecting the eastern side of Benfontein are a threat to the White-backed Vultures and large terrestrial birds such as Blue Crane and Ludwig's Bustard.

A total number of 289 bird species have been recorded from the region. As many as 28 listed bird species are known from the region, all of which are classified as Vulnerable, Near Threatened, Endangered or Critically Endangered according to the IUCN or SA Red Data Book of birds. Furthermore, all birds are protected either according to Schedule 1, 2 or 3 of NCNCA.

Plants in general, from grass tufts to shrubs and trees provide important micro-habitats to birds and therefore the entire study area is expected to host a diverse avifauna community. None of the species of conservation concern were observed during the field survey, but the most common species expected to occur in the terrestrial habitats of the earmarked areas include Kori Bustard (Near Threatened), Ludwig's Bustard (Endangered /Vulnerable), Tawny Eagle (Vulnerable/Endangered), Black Harrier (Endangered), European Roller (Near Threatened) and Secretarybird (Endangered /Vulnerable).

Many of the remaining species of conservation concern are also expected to occur on site either by occasionally passing over, foraging, or nesting.

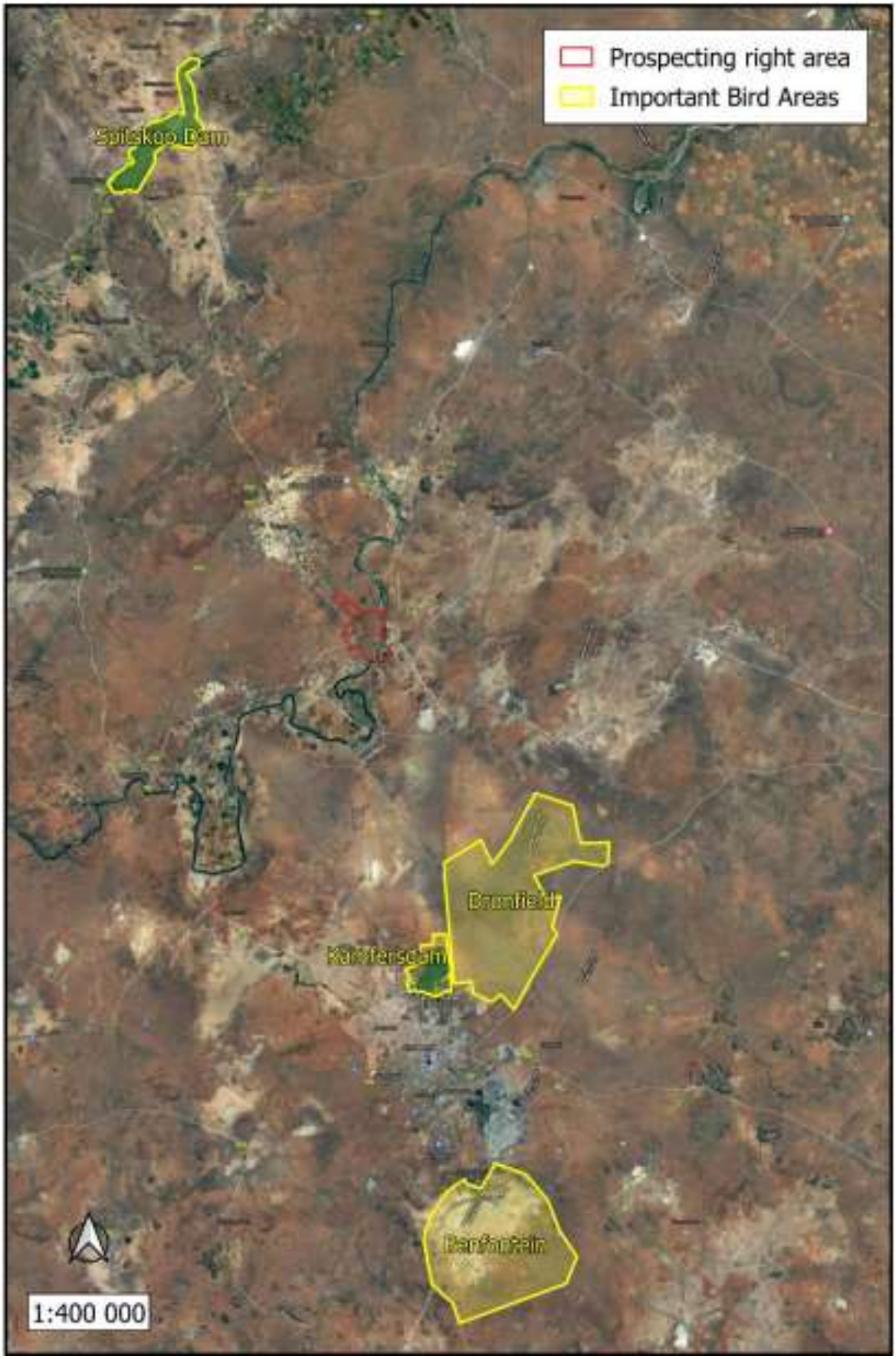


Figure 15. The proposed prospecting right area lies in the vicinity of four Important Bird Areas, i.e., Spitskop Dam, Kamfers Dam, Dronfield Nature Reserve and Benfontein.

Fish

In addition to those regulations in the NCNCA pertaining to wild animals, Section 32 and 33 of the NCNCA states that no person may, without a permit angle and not immediately release, catch, import, export, transport, keep, possess, breed, or trade in a specimen of a specially protected (Schedule 1) or protected (Schedule 2) fish.

At least seven fish species are expected to be found in the channel of the perennial Vaal River. These are listed in Table 10 in the report, along with their conservation status and sensitivity to physico-chemical and no-flow conditions. All of these are listed as least concern. However, they are all protected either according to Schedule 1 or 2 of the NCNCA.

Specially protected species include the Rock-catfish, Moggel and Vaal-orange Smallmouth Yellowfish. The populations of all three these species are highly fragmented, and they are experiencing continued decline of mature individuals due to the continuing decline in area, extent, and quality of their habitat.

The Rock-catfish appears to be very habitat specific and favours rivers with rocky cobble beds that have riffles, rapids and runs, and good water quality. Moggel prefers slow or gently flowing water and is a migratory species that breeds after rains in summer, and spawns in shallow river channels and floodplains. Vaal-orange Smallmouth Yellowfish typically occur in pools, riffles and rapids and fast flowing rivers, preferring sand and gravel substrates. They migrate to suitable gravel beds and breed in spring to midsummer after major summer rains.

Invertebrates

Invertebrates dominate inland habitats and play a significant role in the overall function of the ecosystem (Kremen et al. 1993, Weisser and Siemann 2004). In general, they are widely distributed and extremely diverse, which makes it almost impossible to list all species that may possibly occur on site without a dedicated study. Invertebrates have also not been surveyed as comprehensively as plants and mammals and therefore current available data on their distribution is much scarcer. Nevertheless, key morphospecies and species of conservation concern are discussed here, as well as the major habitats which delimit possible invertebrate communities on site.

Eight invertebrate species of the Northern Cape appear on the IUCN Red. However, none of these species' distribution ranges overlap with that of the study area. In addition, those species that are specially protected according to Schedule 1 of the NCNCA include all Velvet worms as well as

some baboon spider species, Stag Beetles and the Flightless Dung Beetle. None of these taxa are known to occur in the study region either.

All Rock- Creeping- and Burrowing Scorpions are protected according to Schedule 2 of the NCNCA, along with several beetles, butterflies and moths. Of these, Burrowing and Rock Scorpions as well as some Gossamer-winged Butterflies, Skippers, Brush-footed Butterflies and Satyrs have the highest likelihood to be found on site.

Two major natural habitats delimit possible invertebrate communities in the study area:

i. **Terrestrial vegetation** classified as Bushveld for insect preference (Picker et al. 2004) Species associated with this habitat type are diverse and are widely distributed. The study area itself is expected to host high invertebrate richness and density, due to the diverse micro habitat opportunities on site. Insect activity during the field survey was limited by the winter climate, but a variety of butterflies have been recorded in the region, including Colias electo electo (African clouded yellow), Pontia helice helice (Southern meadow white), Zizeeria knysna Knysna (African grass blue), Danaus chrysippus orientis (African plain tiger), Junonia hierta cebrene (Yellow pansy), Vanessa cardui (Painted lady), Rhodometra sacraria, and Tarucus sybaris linearis (Dotted pierrot). Termitaria, most likely belonging to Trinervitermes trinervoides, are also abundant in the open shrubland community.

ii. **Perennial river** Invertebrates expected to be associated with the Vaal River's active channel and adjacent floodplain habitats include flatworms (Turbellaria), earthworms (Oligochaeta), leeches (Hirudinea), crabs (Potamonautidae), shrimp (Atyidae), stoneflies (Perlidae), mayflies (Baetidae, Caenidae, Heptageniidae, Leptophlebiidae, Tricorythidae), damselflies (Chlorocyphidae, Synlestidae, Coenagrionidae), dragonflies (Aeshnidae, Gomphidae, Libellulidae), giant water bugs (Belostomatidae), water boatmen (Corixidae), water striders (Gerridae), marsh treaders (Hydrometridae), creeping water bugs (Naucoridae), water scorpions (Nepidae), backswimmers (Notonectidae), pigmy backswimmers (Pleidae), riffle bugs (Veliidae), caddisflies (Ecnomidae, Hydropsychidae, Epidostomatidae, Leptoceridae), predaceous diving beetles (Dytiscidae), riffle beetles (Elmidae), whirligig beetles (Gyrinidae), minute moss beetles (Hydraenidae), water scavenger beetles (Hydrophilidae), water snipe flies (Athericidae), biting midges (Ceratopogonidae), non-biting midges (Chironomidae), meniscus midges (Dixidae), mosquitos (Culicidae), shore flies (Ephydridae), house flies (Muscidae), drain flies

(Psychodidae), black flies (Simuliidae), hoverflies (Syrphidae), horse-flies (Tabanidae), crane flies (Tipulidae), limpets (Ancylidae), pond snails (Lymnaeidae), bladder snails (Physidae), ramshorn snails (Planorbinae), trumpet snails (Thiaridae), clams (Corbiculidae, Sphaeriidae) and freshwater mussels (Unionidae).

- **Flora:**

Dr Elizabeth (Betsie) Milne has been appointed by Wadala Mining to provide an ecological study in order to highlight the ecological characteristics of the proposed prospecting area, and to determine the possible impact of prospecting on the diversity and ecological status of the application area natural flora was described and included in this report as part of the ecological study. (Appendix 4).

This ecological assessment report attached as Appendix 4 describes the ecological characteristics of the proposed prospecting area, identifies the source of impacts from prospecting, and assesses the impacts, as well as the residual impacts after closure.

Broad-scale vegetation patterns

The study area falls within the Savanna and Azonal Vegetation Biomes (Mucina and Rutherford 2006). According to the vegetation map of Mucina and Rutherford (2012), the site is represented by two broad-scale vegetation units from the Upper Karoo and Alluvial Vegetation Bioregions, i.e. Kimberley Thornveld and Highveld Alluvial Vegetation (Figure 16).

Kimberley Thornveld is distributed in the North-West, Free State and Northern Cape Provinces at altitudes between 1 050 and 1 400 m. It is found in the Kimberley, Hartswater, Bloemhof and Hoopstad Districts, but is also within the Warrenton, Christiana, Taung, Boshof and Barkly West Districts. The unit is typically presented as slightly undulating sandy plains with a well-developed tree and shrub layer and an open grass layer. Andesitic lavas of the Allanridge Formation occur in the north and west, while fine-grained sediments of the Karoo Supergroup are found in the south and east. Soils are deep, sandy to loamy, and of the Hutton form. The most common land types are Ae and Ah. The unit is classified as being least threatened, but 18 % has already been transformed, predominantly by cultivation.

Only 2 % is currently conserved in statutory reserves and no endemic species are known from this unit. It is specifically prone to Acacia mellifera encroachment following overgrazing, but the occurrence and risk of erosion is very low.

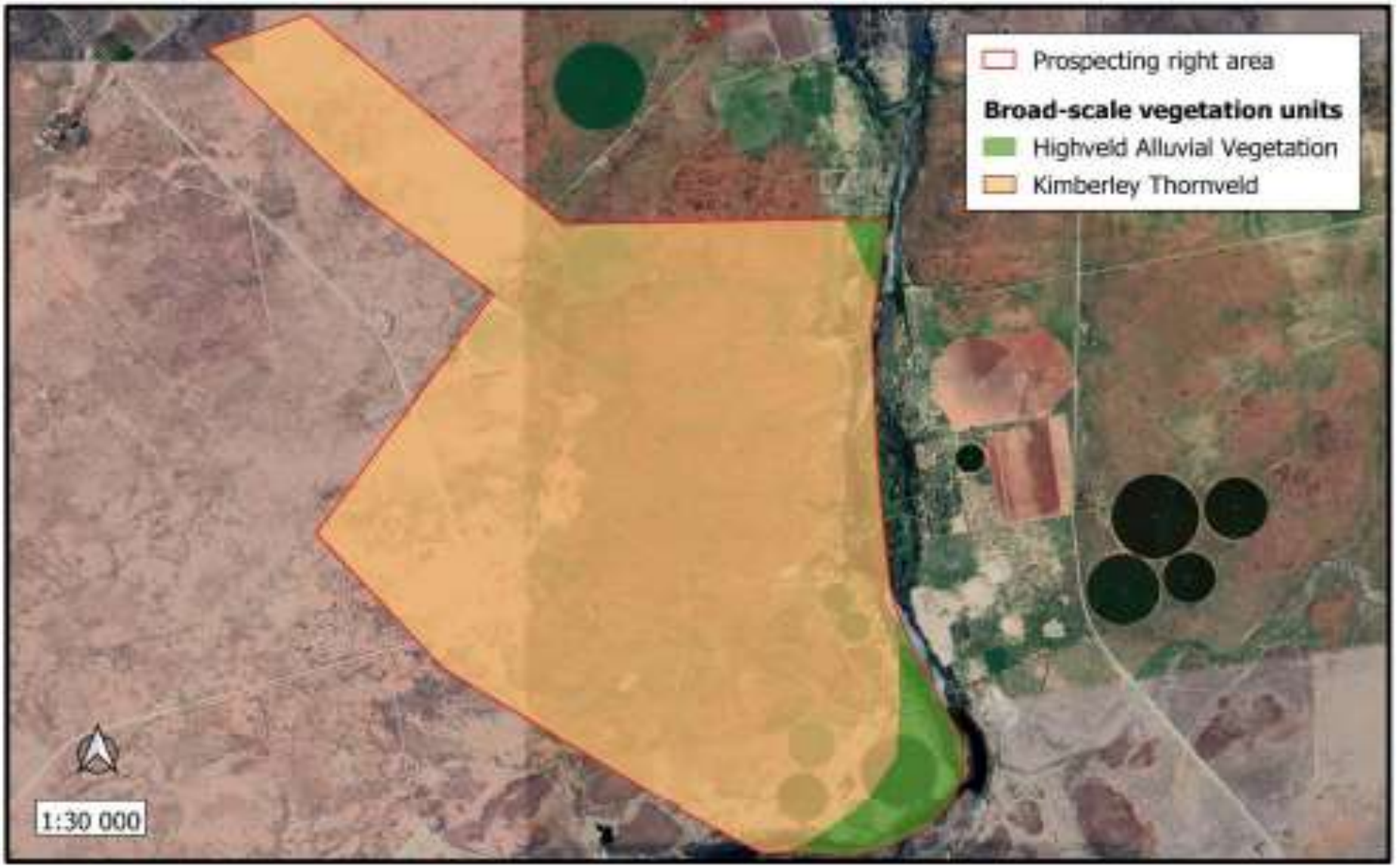


Figure 16. The broad-scale vegetation units (Mucina and Rutherford 2012) present in the study area

Highveld Alluvial Vegetation falls within the Azonal Vegetation Biome and is mainly distributed in the Free State, North-West, Mpumalanga and Gauteng Provinces, but is also found in alluvial drainage lines and floodplains along marginal (eastern) units of the Savanna Biome in Northern Cape. Altitude ranges between 1 000 and 1 500 m. The unit is typically presented with flat topography supporting riparian thickets, mostly dominated by Vachellia karroo. It is accompanied by seasonally flooded grasslands and disturbed herblands often dominated by alien plants. The geology comprises of deep sandy to clayey (but mostly coarse sand) alluvial soils that developed over Quaternary alluvial sediments. Oakleaf, Dundee, Shortlands, Glenrosa and Mispah soil forms were identified in the Vaal River floodplain. Rivers are perennial and often flood in summer. Erosion of the banks and deposition of new fine soil on alluvium can be of considerable extent. Some smaller anastomosing channels of major rivers can dry out in winter. The unit is classified as being least threatened, with 10% being conserved within formal conservation areas, e.g., Bloemhof Dam, Christiana, Baberspan, Wolwespruit, Sandvlei, Schoonspruit, Faan Meintjes and Soetdoring Nature Reserves. More than a quarter has been transformed for cultivation and by building of dams. The unit is highly prone to invasion by alien weeds, while the undergrowth suffers from overgrazing. No endemic species are known from this unit.

Fine-scale vegetation patterns

Plant communities in the study area are delineated according to plant species correspondences and changes in soil structure. They can be divided into four distinct units (Figure 17), which are described below. These descriptions include unique characteristics and the dominant species found in each unit. A complete plant species list, including those species historically recorded in the region is presented in Appendix 1 attached to the ecological report. Areas that have already been completely transformed by agriculture is indicated on the map, but will not be discussed further.

i) Aristida diffusa - Eragrostis rigidior grassland

This community covers a small area in the north-west corner of the study area. Here, red sandy soil constitutes < 5% of the ground surface. The vegetation represents a fairly dense grassland community, with a diverse assemblage of low shrubs scattered in the grassy matrix (Figure 17).

The grass layer is dominated by Aristida diffusa and Eragrostis rigidior, but Aristida congesta subsp. barbicollis, Enneapogon cenchroides, Eragrostis lehmanniana and E. obtusa are also very common. Other grasses include Heteropogon contortus and Fingerhuthia africana.

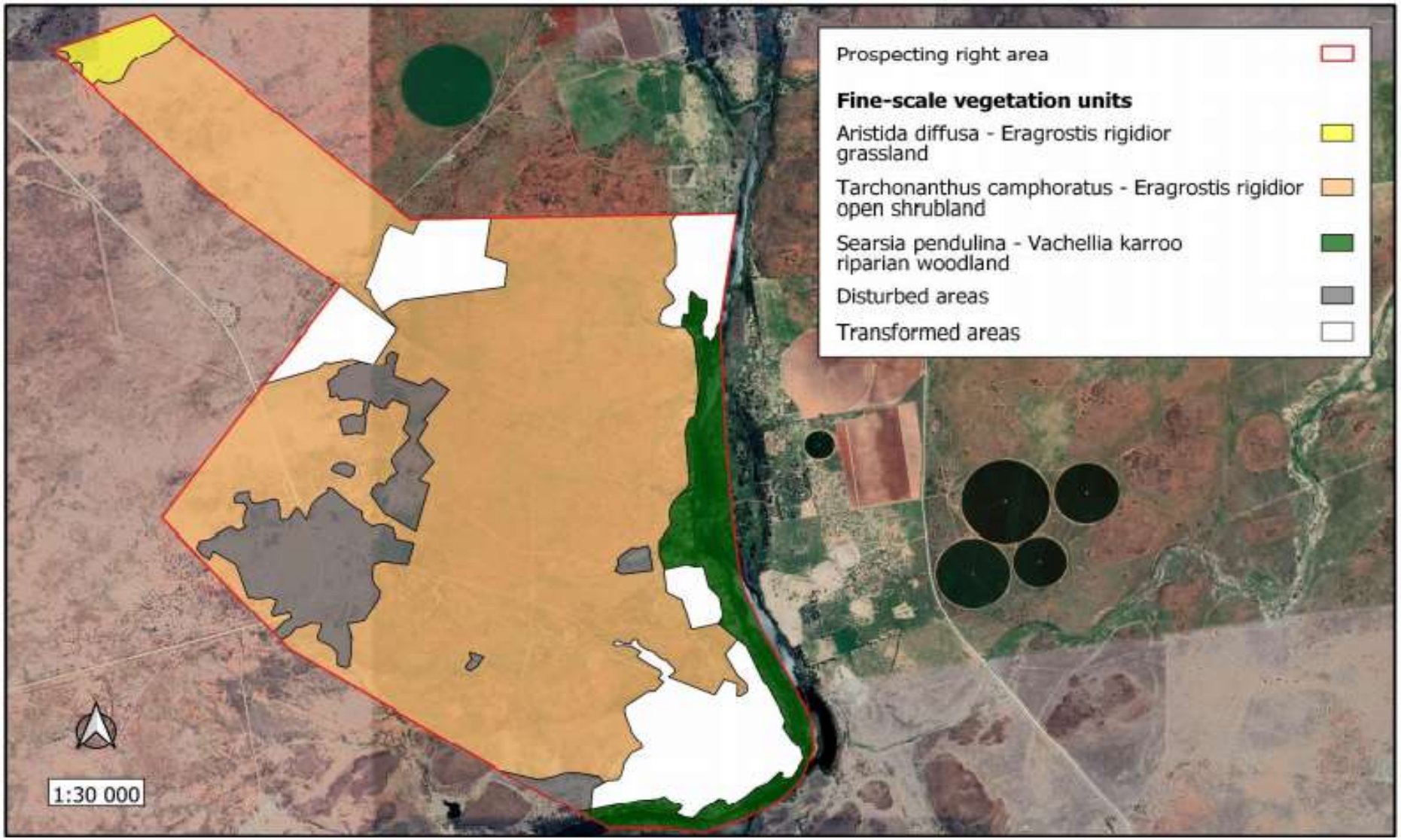


Figure 17. The distribution of proposed fine-scale plant communities in the study area.

Tallshrubs like Ehretia rigida, Tarchonanthus camphoratus, Ziziphus mucronata, Grewia flava, Vachellia tortilis and Senegalia mellifera are sparsely scattered across the grassland and becomes more prevalent towards the transition zone with the open shrubland. Low shrubs are however well intermixed with the grasses and include Pentzia calcarea, Aptosimum marlothii, A. elongatum, A. spinescens, Leonotis pentadentata, Zygophyllum sp., Melolobium calycinum, Hertia pallens, Eriocephalus sp., Salsola tuberculata, Asparagus suaveolens, Lycium cinereum and Sericocoma avolans. Rhigozum trichotomum occur as disjunct patches.

Common herbsinclude Phyllanthus maderaspatensis, Dicoma capensis and Geigeria ornativa.

ii) **Tarchonanthus camphoratus - Eragrostis rigidior open shrubland**

This community covers most of the study area (Figure 17) and is found on sandy soil interspersed with rocks. This substrate covers around 5% of the ground cover, but biological crusts are also common. The vegetation is presented as an open shrubland, with a matrix that mimics that of the grassland community, but the tall shrub layer is much more prominent (Figure 17).

The shrub layer is dominated by Tarchonanthus camphoratus, with tallershrubs and trees such as Senegalia mellifera, Vachellia tortilis, Ziziphus mucronata, Searsia pendulina and Ehretia rigida also being common. Low shrubs include Aptosimum marlothii, A. elongatum, A. spinescens, Leonotis pentadentata, Barleria rigida, Asparagus suaveolens, Sericocoma avolans, Hermannia affinis, Gomphocarpus fruticosus and Cadaba aphylla.

The grass layer is dominated by Eragrostis rigidior, but other common grasses include Aristida congesta subsp. barbicollis, A. diffusa, Eragrostis lehmanniana, Enneapogon cenchroides and Pogonarthria squarrosa. Heteropogon contortus, Eragrostis superba, Melinis repens, Enneapogon scoparius, Aristida congesta subsp. congesta, Themeda triandra, Digitaria eriantha and Cymbopogon pospischilii also occur here.

The herbs Chascanum pinnatifidum and Aloe grandidentata were commonly found here.

iii) Searsia pendulina - Vachellia karroo riparian woodland

The riparian woodland lines the immediate banks of the Vaal River, as well as all the major drainage lines that occur in its catchment. However, much of the pristine woodland has already been transformed by historic land use activities. The vegetation is typically presented by a dense tall canopy and a sparse understory.

The tree canopy is dominated by Searsia pendulina and Vachellia karroo, but Ziziphus mucronata, Salix mucronata and Eucalyptus camaldulensis is also very

common. The understory includes shrubs such as Diospyros lycioides, Gymnosporia buxifolia and Asparagus sp., while the grass Setaria verticillata and the weeds Argemone ochroleuca and Tagetes minuta are also found here.

iv) **Disturbed areas**

The disturbed areas include those areas that have been subjected to historic mining activities and are primarily found in the south-west of the study area. It is presented as a monotonous grassland, intermixed with a high density of weeds and clumps of encroaching shrub species.

Enneapogon cenchroides is by far the most dominant grass species found here, but other grasses include Eragrostis rigidior, Ennapogon scoparius, Aristida congesta subsp. congesta, A. diffusa and Fingerhuthia africana. The shrub layer is represented by Vachellia tortilis, Tarchonanthus camphoratus, Vachellia karroo, Senegalia mellifera, Grewia flava, Ziziphus mucronata and Cadaba aphylla. The herb Abutilon austroafricanum is also commonly and Aloe grandidentata have found refuge under the remaining tree species in this disturbed community. Alien weeds include Bidens pilosa, Rumex crispus, Datura ferox, Xanthium spinosum and Opuntia sp. Tamarix spp. are restricted to the old slimes dams.

- ***SURFACE WATER***

The study area falls within the Vaal D/S Bloemhof quaternary catchments C91D of the Lower Vaal Water Management Area (Figure 18). The quaternary catchment has been allocated a Present Ecological State (PES) of 'largely modified' (D) by Delport and Mallory (2002) and information regarding mean annual rainfall, evaporation potential and runoff for the quaternary catchments is provided in.

Table 4. Catchment characteristics for the Vaal D/S Bloemhof quaternary catchment in which the study area falls, as presented by Delport and Mallory (2002).

Quaternary catchment	Catchment Area (km^2)	Mean Annual Rainfall (mm)	Mean Annual Evaporation (mm)	Mean Annual Runoff (10^6 m^3)
C91D	2 697	397	2 050	4.22

The South African Inventory of Inland Aquatic Ecosystems was developed in response to a multistakeholder need for the planning, conservation, and management of inland aquatic ecosystems, as mandated by a number of legislative Acts, including the South African National Water Act (NWA) and the National Environmental Management: Biodiversity Act (NEMBA). This inventory formed part of the National Biodiversity Assessment of 2018 and is built on previous efforts of NFEPA and the NBA of 2011. It includes a collection of data layers related to ecosystem types and pressures for rivers and inland wetlands (Van Deventer et al. 2018).

According to SAIIAE, the study area falls within the Eastern Kalahari Bushveld Bioregion, where 1.3 % of the land area is covered by inland wetlands, including depressions, floodplains, seeps and valley-bottom wetland types (Van Deventer et al. 2019). The spatial extent according to the SAIIAE present ecological status per wetland type is depicted in Table 3. Depressions are most abundant in the bioregion, with the majority in natural or near-natural condition. The remaining wetland types have been moderately to severely modified.

Table 5. Percentage of inland wetland spatial extent according to the present ecological status per wetland type of the Eastern Kalahari Bushveld Bioregion.

Wetland type	Total Extent (%)	% Natural or near-natural (A/B)	% Moderately modified (C)	% Heavily to severely/critically modified (D/E/F)
Depression	57.1	70.5	5.7	23.8
Floodplain	2.2	0.6	48.8	50.5
Seep	17.2	10	15.1	75
Valley-bottom	23.5	0.9	29.6	69.5

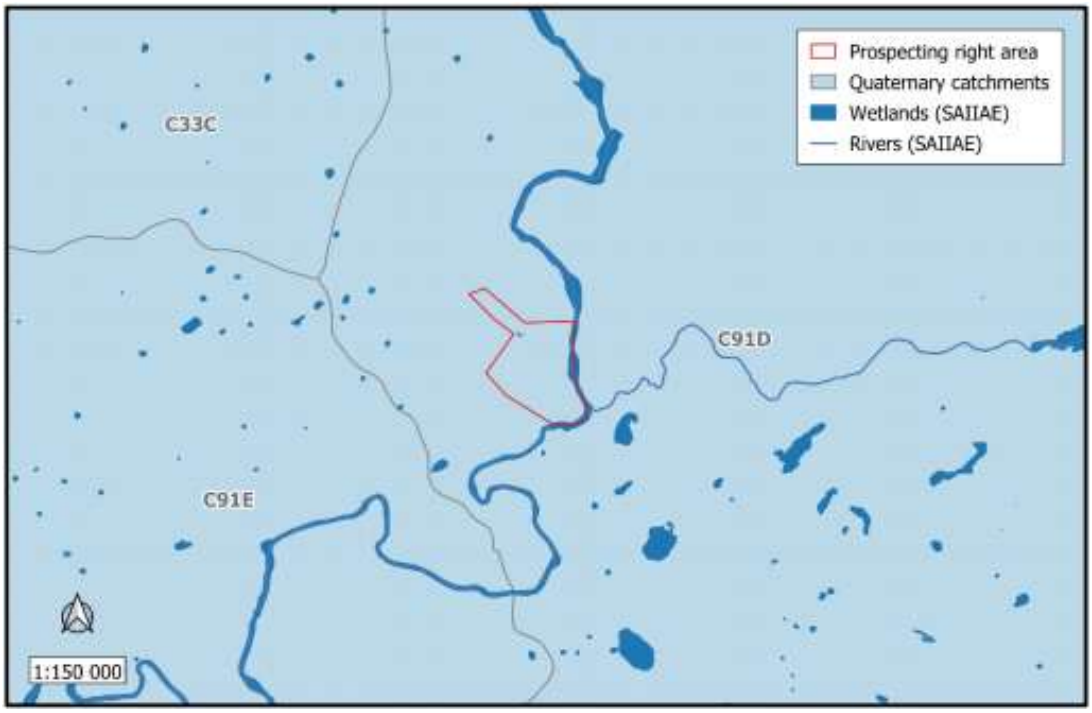


Figure 18. The locality of the proposed prospecting area in relation to the quaternary catchments of the Lower Vaal Water Management Area.

The study area does not comprise any natural wetlands, apart from the floodplains associated with the river channel that lines the border of the site in the east (Figure 19).

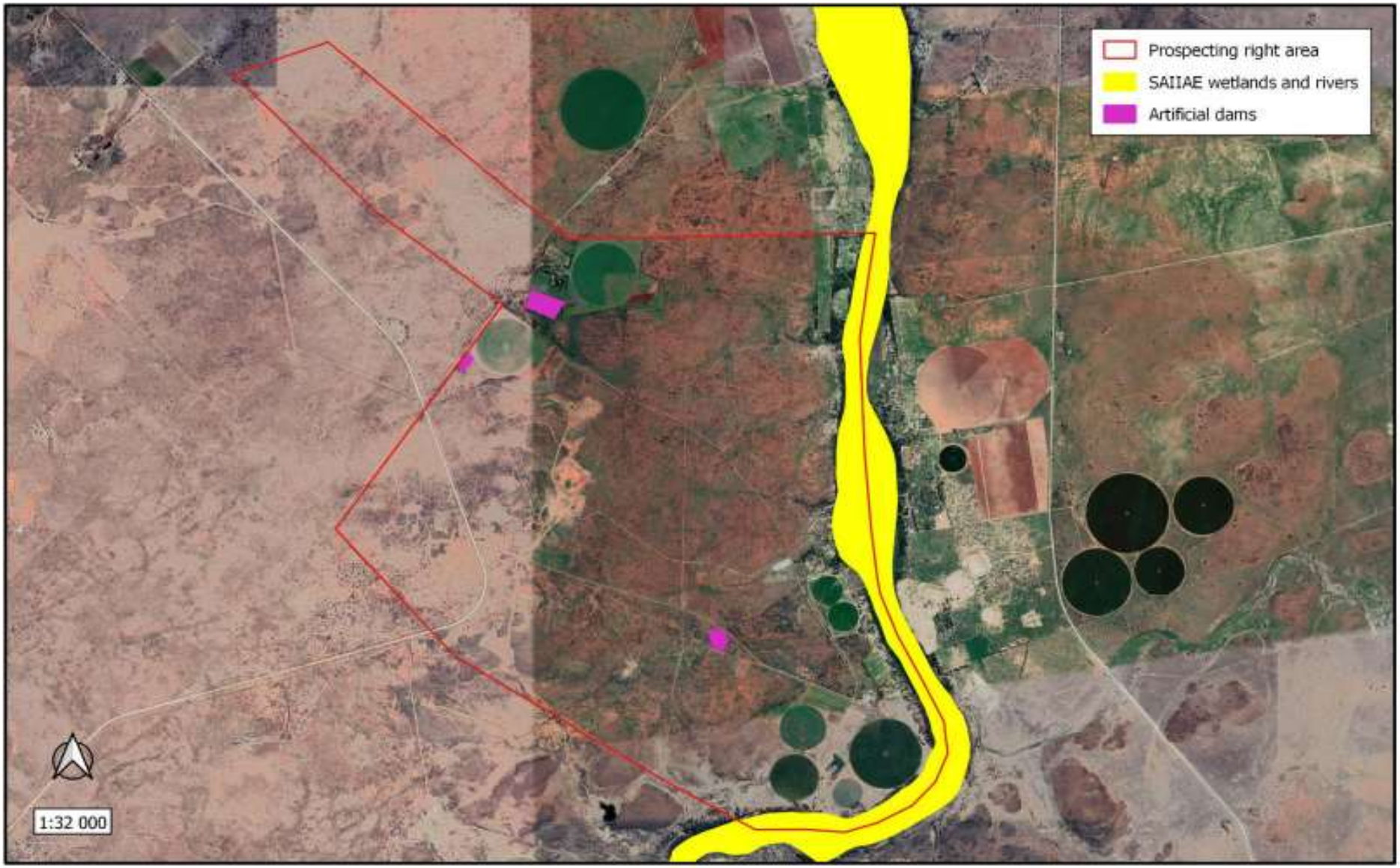


Figure 19. The location of SAIIAE wetlands on the proposed prospecting right area

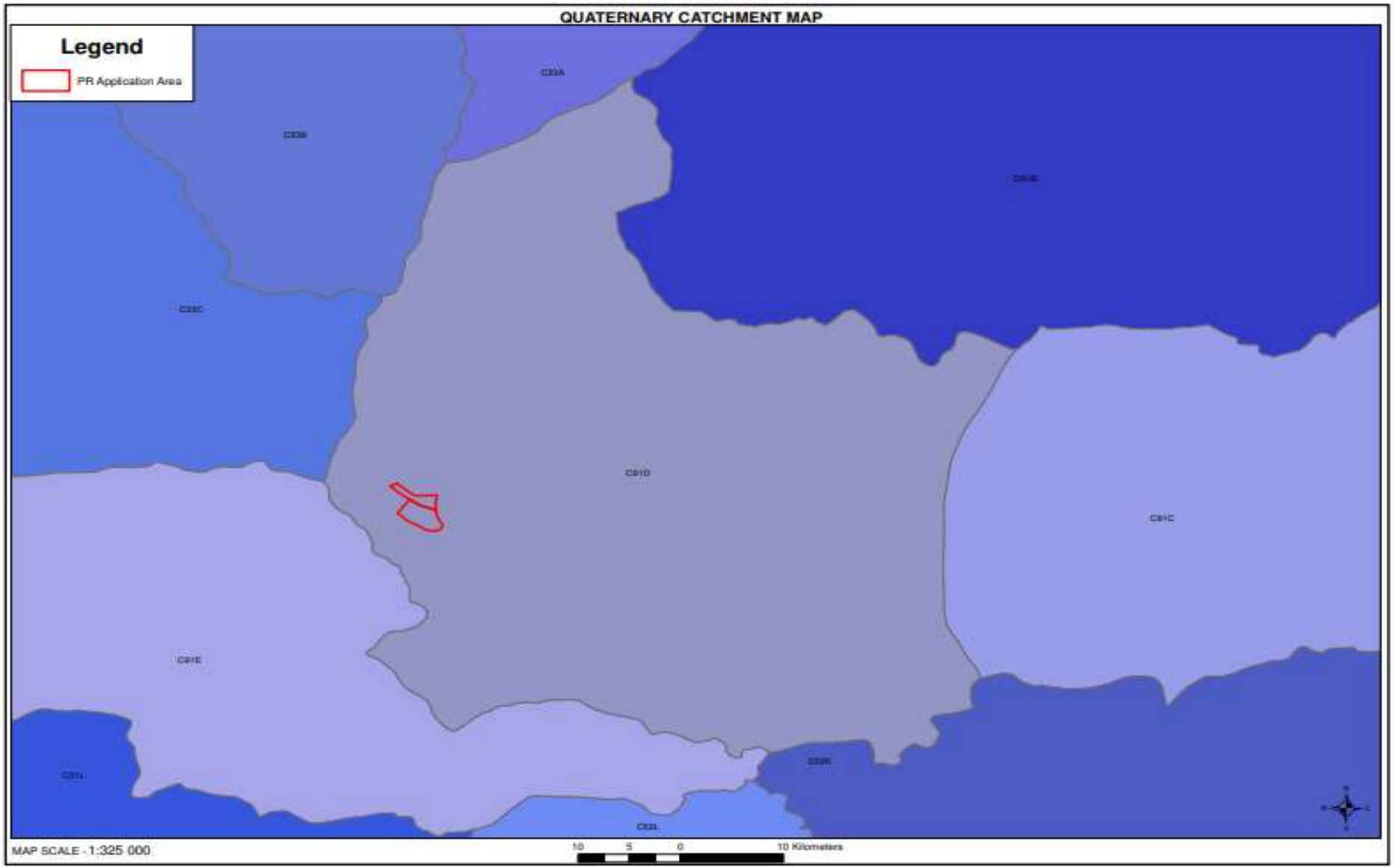


Figure 20. Catchment area

- ***GROUND WATER:***

Depth of water-table(s):
Groundwater flow would follow the topography and the surface drainage direction from the higher areas towards the lower areas in towards the Vaal River.

Ground-water zone:
The diamond bulk sampling does not affect the quality of the ground water in any manner. There are no harmful or toxic properties in the gravels being mined. The recycling of the water only requires sediment settling, thus no aquifers and aquicludes are on the property.

- ***AIR QUALITY AND NOISE:***

With reference to the listed activities and associated minimum emission standards identified in terms of section 21 of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004).
NOTICE OF INTENTION TO AMEND THE LIST OF ACTIVITIES WHICH RESULT IN ATMOSPHERIC EMISSIONS WHICH HAVE OR MAY HAVE A SIGNIFICANT DETRIMENTAL EFFECT ON THE ENVIRONMENT, INCLUDING HEALTH, SOCIAL CONDITIONS, ECONOMIC CONDITIONS, ECOLOGICAL CONDITIONS OR CULTURAL HERITAGE, Alluvial diamond prospecting is not a scheduled process that relates to the prospecting activity.

Existing Sources
The current source of air pollution in the area stems from numerous mining operations along the Vaal River and from vehicles travelling on the gravel roads of the area. Farming activity, especially ploughing of the irrigation fields, may generate dust during certain periods of the year.

The general air quality on the area is expected to be good.

New source
The source of air pollution on the farm will be nuisance dust generated by the opencast bulk sampling process, the loading of gravels onto the transport trucks, the dumping of gravels over each sites primary screen or feeder bins as well as from the movement of trucks and vehicles on the prospecting roads. Gas emissions from machinery will be within legal limits.

Areas of impact
As the prevailing wind direction for the area is north to North West for the months January to September and changing from north to sometimes westerly winds during October to December, there is a potential for fall-out dust to impact on the surrounding properties – which can be described as the

nearest potential area of impact. The dust management programme recommended should include daily dosing of access roads and stockpile areas if the bulk sampling stage is reached.

The dust is controlled by watering down the roadway used by these trucks while bulk sampling. The mineral processing is a wet process; thus, no dust is generated.

A complain register for surrounding owners and the community will be kept on site and the management of dust would be guided by these additionally comments of public.

Noise

Existing sources:
Noise on site will come from the large vehicles (tip trucks, front-end loader, back actor), from the working pan.

There are farming operations on both sides of the proposed prospecting operation. Although these operations do generate noise the overall impact can be described as negligible.

The impact would be of more importance regarding the direct worker environment that should adhere to the requirements in terms of the Mine Health and Safety Act. These noise levels will be continuous, and the operators will be issued with earplugs.

Noise is normally encountered during the normal operation hours at the processing plant. Processing plant noise and mine vehicles are limited between 7am and 5pm every day during the week. Noise levels will be monitored on the Prospecting area and where necessary, protective equipment is used in certain areas where machinery is used.

- ***VISUAL ASPECTS:***

The prospecting site would possibly be visible form the secondary gravel roads on the farms. The negative visual impacts associated with open pits for the bulk sampling and the washing pan will however have a low negative impact since it will be visible to the landowners and can be visible from the secondary gravel road. There is however no method of reducing the impact during bulk sampling operations (operational phase), it can only be mitigation by doing concurrent rehabilitation of bulk samples as prospecting progress.

- **AREAS OF CULTURAL-HISTORICAL OR ARCHAEOLOGICAL INTEREST**

This Heritage Impact Assessment (HIA) Report has been prepared in support of a prospecting right application lodged by Bokamoso Exploration (Pty) Ltd on PORTION 6 (EMIL – A PORTION OF PORTION 3 (ONVERWAG)) OF THE FARM ELANDS DRIFT 159, BARKLY-WES AND REMAINING EXTENT OF PORTION 1 OF THE FARM SLANGHEUVEL 160, BARKLY-WES, Northern Cape Province. A project of this nature and scale triggers a Phase I HIA in terms of Section 38(8) of the National Heritage Resources Act (25/1999). This entailed a site visit and ground survey on 9 – 10 JUNE 2021 during which the heritage sensitivity and potential adverse impacts of the proposed activities were assessed by Dr. Edward Matenga (Appendix 5).

The heritage sensitivity of the property is summarised as follows:

1. *The Stone Age*
   A few stone tools were found. The occurrence of a cleaver (BMK08) shows the Early Stone Age origins of the stone tool cultures which became well established in subsequent epochs of the Stone Age, i.e. the Middle and Late State Age. None of the finds warrants further action.

2. *The Iron Age*
   No material dating to the Iron Age was found.

3. *Historic buildings*
   There are a number of buildings of different typologies on the property. Together they constitute the built environment typical of many farms in the broader area. Increasingly this is being recognised as a cultural landscape of heritage significance. The circular fields under pivot irrigation add another key element to the landscape as they are a common occurrence on the silt banks of the Vaal and Orange Rivers. None of buildings will be affected by the prospecting and mining operations.

4. *Burial grounds*
   Two burial grounds were recorded (BMK04, BMK13). It is recommended that the burial grounds are fenced off and 100 m buffer reserved in

accordance with SAHRA minimum standards. If operations will encroach into the buffer area, a permit must be obtained from SAHRA.

Palaeontology

A palaeontological Impact Assessment was requested for the Prospecting Rights application on PORTION 6 (EMIL – A PORTION OF PORTION 3 (ONVERWAG)) OF THE FARM ELANDS DRIFT 159, BARKLY-WES AND REMAINING EXTENT OF PORTION 1 OF THE FARM SLANGHEUVEL 160, BARKLY-WES, Northern Cape Province. To comply with the South African Heritage Resources Agency (SAHRA) in terms of Section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA), a desktop Palaeontological Impact Assessment (PIA) was completed for the proposed project (Appendix 6).

Based on experience and the lack of any previously recorded fossils from the area, it is unlikely that any fossils would be preserved in the sands and alluvium of the Quaternary. There is a small chance that fossils may occur in the shales of the early Permian Prince Albert Formation (Ecca Group, Karoo Supergroup) so a Fossil Chance Find Protocol should be added to the EMPr. If fossils are found once excavating and prospecting have commenced then they should be rescued and a palaeontologist called to assess and collect a representative sample.

Chance Find Protocol

Monitoring Programme for Palaeontology – to commence once the excavations / drilling / mining activities begin.

1. **The following procedure is only required if fossils are seen on the surface and when drilling/excavations/mining commence.**
2. **When excavations begin the rocks and must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (plants, insects, bone, coal) should be put aside in a suitably protected place. This way the project activities will not be interrupted.**
3. **Photographs of similar fossils must be provided to the developer to assist in recognizing the fossil plants, vertebrates, invertebrates or trace fossils in the shales and mudstones. This information will be built into the EMP's training and awareness plan and procedures.**
4. **Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment.**
5. **If there is any possible fossil material found by the developer/environmental officer/miners then the qualified palaeontologist sub-contracted for this project, should visit the site to inspect the selected material and check the dumps where feasible.**

6. **Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site a SAHRA permit must be obtained. Annual reports must be submitted to SAHRA as required by the relevant permits.**
7. **If no good fossil material is recovered then no site inspections by the palaeontologist will be necessary. A final report by the palaeontologist must be sent to SAHRA once the project has been completed and only if there are fossils.**
8. **If no fossils are found and the excavations have finished then no further monitoring is required.**

- ***BROAD-SCALE ECOLOGICAL PROCESSES:***

Critical biodiversity areas and broad-scale processes

The proposed prospecting site falls partially within critical biodiversity areas (Figure 21), as defined by the Northern Cape Critical Biodiversity Areas Map (Holness and Oosthuysen 2016). This map identifies biodiversity priority areas, called Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs), which, together with protected areas, are important for the persistence of a viable representative sample of all ecosystem types and species as well as the long-term ecological functioning of the landscape. The Vaal River is classified as Critical Biodiversity Area One, with its associated buffer- and catchment areas classified as Ecological Support Areas (Figure 21). Most of the earmarked area is however classified as Other Natural Areas, which does not constitute any specific biodiversity priorities. No Critical Biodiversity Area Two or Protected Areas occur in the study area.

Similarly, the Mining and Biodiversity Guidelines (DENC et al. 2013) recognises sections along the Vaal River to be of Highest Biodiversity Importance, which constitute a high risk for mining. These guidelines were developed to identify and categorize biodiversity priority areas sensitive to the impacts of mining to support mainstreaming of biodiversity issues in decision making in the mining sector.

Furthermore, according to the National Web based Environmental Screening Tool the study area is considered to have sensitive environmental features (Figure 22). This tool is a geographically based web-enabled application which allows a proponent intending to apply for environmental authorisation in terms of the Environmental Impact Assessment (EIA) Regulations 2014 (as amended), to screen their proposed site for any environmental sensitivity.
According to this, the pristine areas of Bokamoso is of medium sensitivity based on the Plant-and Animal species Themes. The plant theme sensitivity relates to several endemic species that have been recorded in the region,

while the animal theme sensitivity is attributed to the suitable habitat associated with the study site for the Endangered Ludwig's Bustard and Secretarybird. The areas along the Vaal River are of very high sensitivity based on the Aquatic- and Terrestrial Biodiversity Themes. The aquatic sensitivity is attributed to the fact that the Vaal River and its associated wetlands are important water resources. The terrestrial sensitivity is a direct function of the Critical Biodiversity Areas One and Ecological Support Areas classifications according to the Northern Cape Critical Biodiversity Areas Map.

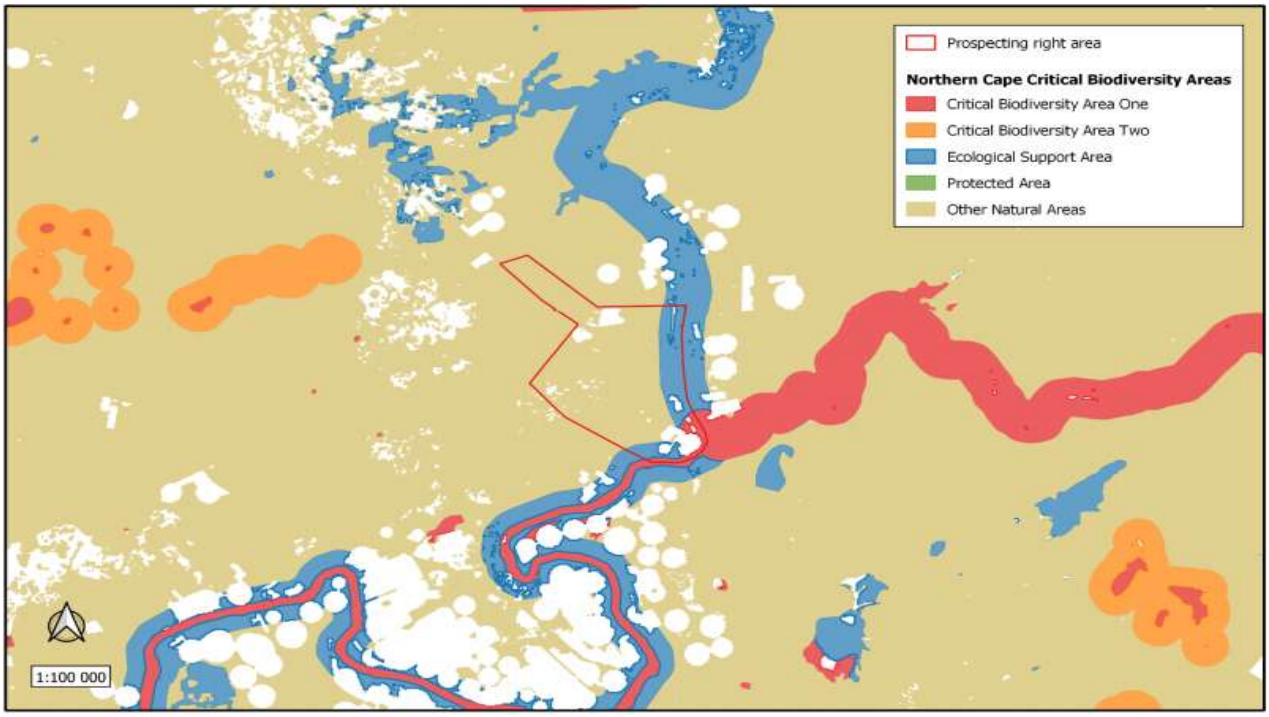


Figure 21. The study area in relation to the Northern Cape Critical Biodiversity areas.

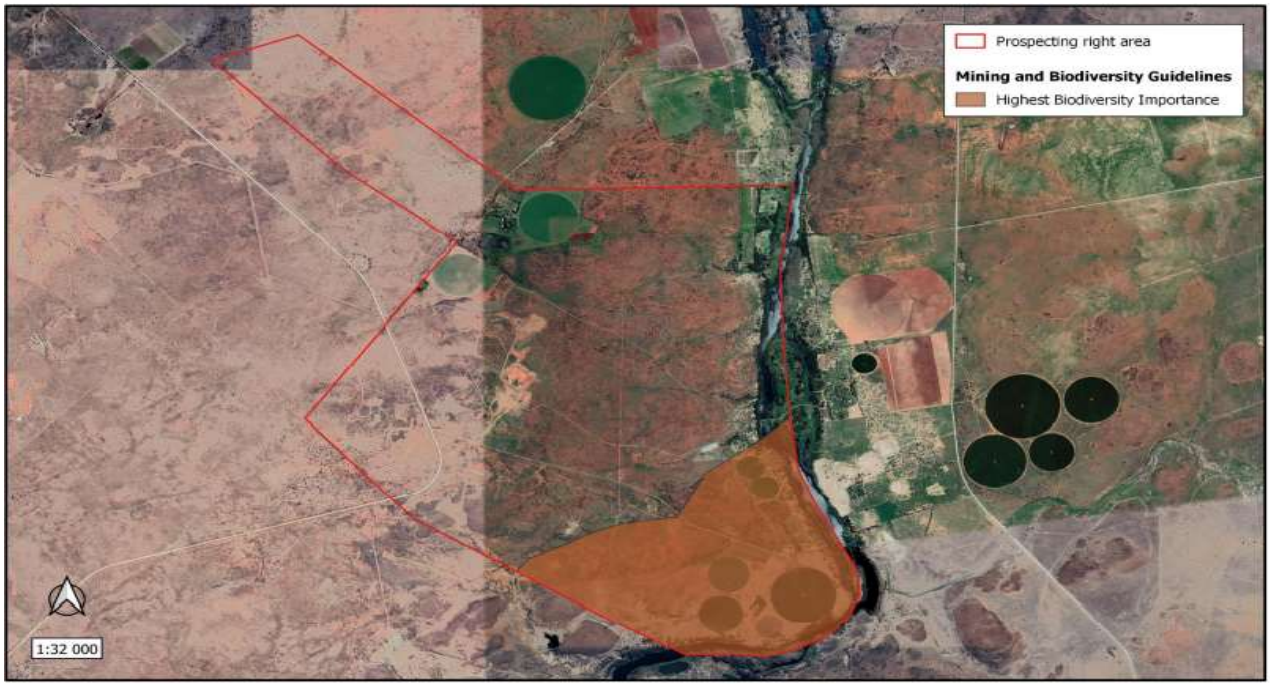


Figure 22. The study area in relation to the Mining and Biodiversity Guidelines.

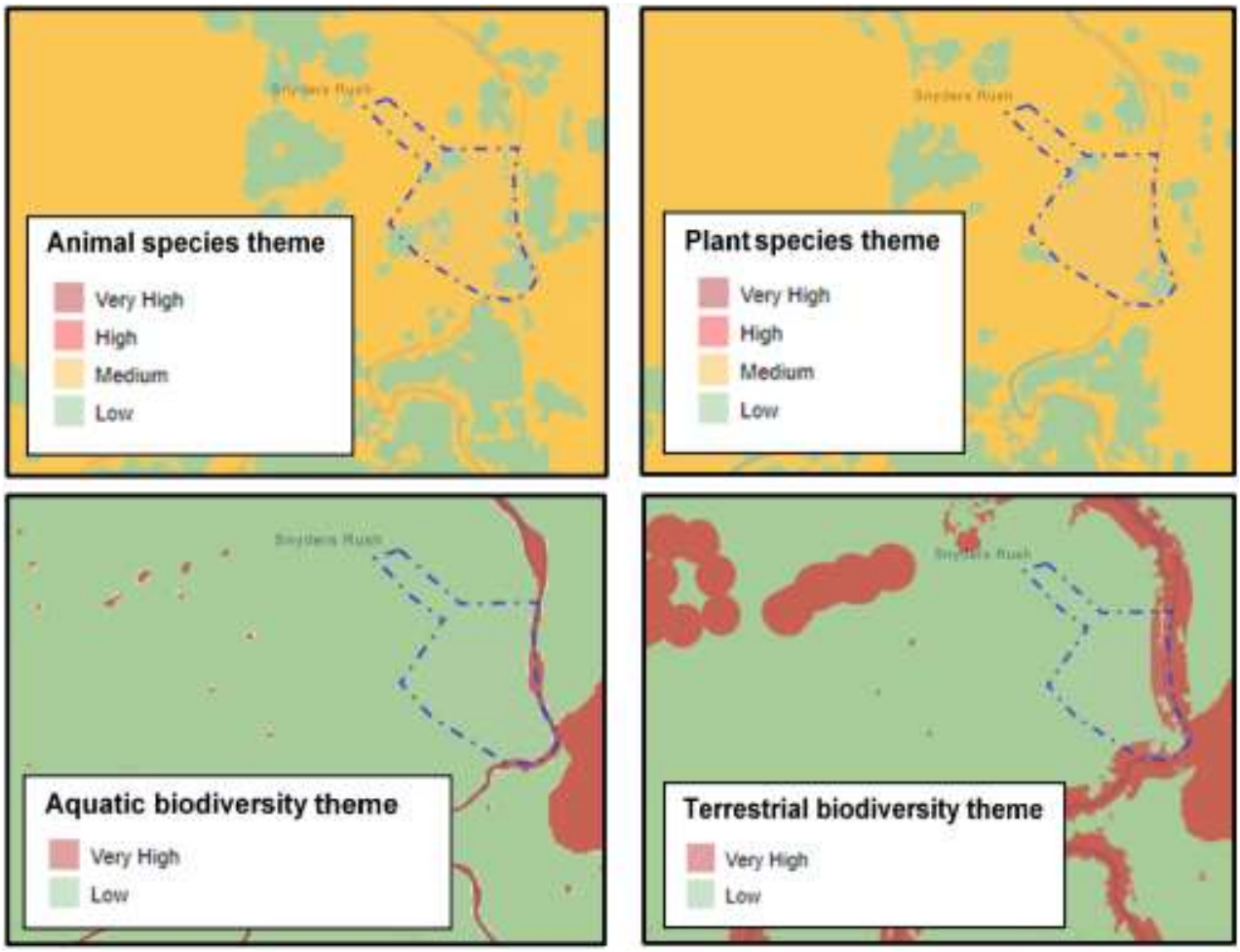


Figure 23. Environmental sensitivities associated with the study area, according to the National Web based Environmental Screening Tool.

With regards to the broad-scale vegetation units of the study area, according to Mucina and Rutherford (2012) the Kimberley Thornveld is classified as least threatened, with 18 % being transformed, mostly by cultivation. The Highveld Alluvial Vegetation is also classified as least threatened, but more than 45 % has already been transformed through cultivation and building of dams. A diverse assemblage of alien tree species has also invaded this vegetation community.

- **SOCIO-ECONOMIC STRUCTURE OF THE REGION:**

Population density, growth and location

The Dikgatlong local Municipality is made up of former municipalities of Barkly West, Windsorton and Delportshoop. The municipality derived its name from Setswana word meaning "confluence", and refers to the place where the Harts ad Vaal Rivers flow into each other in Delortshoop. It is situated 30km west of Kimberley the geographical area of the municipality is 2377.6 square kilometres or 19.2% of the district. The population density of the municipality is currently standing at 9.1 people per square kilometre.

The Northern Cape population is estimated at 1,103,900 according to Statistics South Africa mid-year estimates of 2010, this is 2,2% of the South Africa's population.

Population Profile

The total population of Dikgatlong is estimated at 35 765 people (Census, 2001). The estimate indicates that Dikgatlong is the second lowest municipality in the district in terms of the population size. The population represents 11.01% of the total population of the district which is approximately 324 798 persons and 4.4% of the province. The dominant population groups in Dikgatlong are Africans (60.2%) and Coloureds (32.5%). The other two groups share the remaining 7.3%, with Indians constituting only 0.1% and Whites 7.2%. The province, the district and the municipality have experienced a declining growth rate of -2.09%, -0.22% and -3.21% respectively.

An independent population count commissioned by Urban Dynamic (Independent Consultant) in 2003 the total population was actually found to be 63,258.

The population pyramid of Dikgatlong is distinctive to other municipalities. It indicates a significant number of economically active group (15 to 64 years) at the top of the pyramid and pensioners (over 65) at the bottom. The economically active group and pensioner constitute 63.1% and 5.1% respectively. The remaining 31.8% is comprised of pre-school and school going population. With the inclusion of Sydney-on-Vaal, Vaalbos and Pniel the geographic size of the municipality has increased considerably.

Economic Profile

The Northern Cape economy is anchored by the primary sector specifically the mining industry with the primary sector contributing 32.6%, secondary 6.2% and the tertiary sector 49.8% (Statistics SA: GDP p0441: 2010). Although the tertiary sector contributes almost 50%, the mining industry alone contributes 24.6% to the provincial value addition.

Northern Cape recorded an average real annual economic growth rate of 2,5% between 1996 and 2007. Average real annual economic growth rate of South Africa for the same period (1996 to 2007) was 3.6%. Global Insight estimated the gross value added of Frances Baard for 2008 at R9.3 billion (constant 2000 prices), this was a growth of 2% of 2007.

For the period 2005 to 2008 the Northern Cape Province had a growth of 3.6%, 4.1%, 4% and 21% respectively.

This however, if put in perspective in terms of the average annual growth (see table below), the district is not comparing badly to the Province which had an average annual growth rate of 3.3% for the period 2002 to 2008 while South Africa for the same period had an average annual growth of 4.6% (Statistics SA: GDP p0441: 2010).

Average annual growth (% Constant 2000 prices) (Sector 1996-2008)

Agriculture	3.8%
Mining	0.8%
Manufacturing	1.3%
Electricity	-2.4%
Construction	3.8%
Trade	5.3%
Transport	4.9%
Finance	3.5%
Community Services	2.8%
Total Industries/GDPR	3.2%

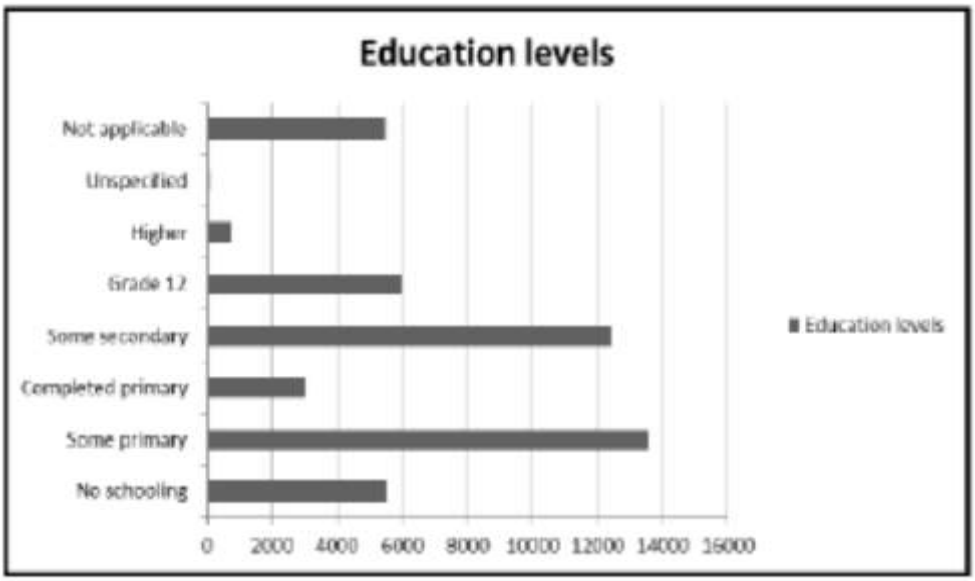
Table 6. Average annual Growth (global Insight:2009)

Community services is the foremost contributor in terms of value addition in the district contributing about 28% followed by finance at 23%, trade at 15%, transport at 11% and mining at 9%.

Education Levels

Education prepares individuals so that they are able to play an active role in the labour market, which directly affects their quality of life as well as the economy of a country and the area they live in. Through the education level, one can understand the skills that an area has and its potential to contribute positively to the economy (Stats SA). Dikgatlong Local Municipality has a large number of people with some secondary school followed by those with some primary levels.

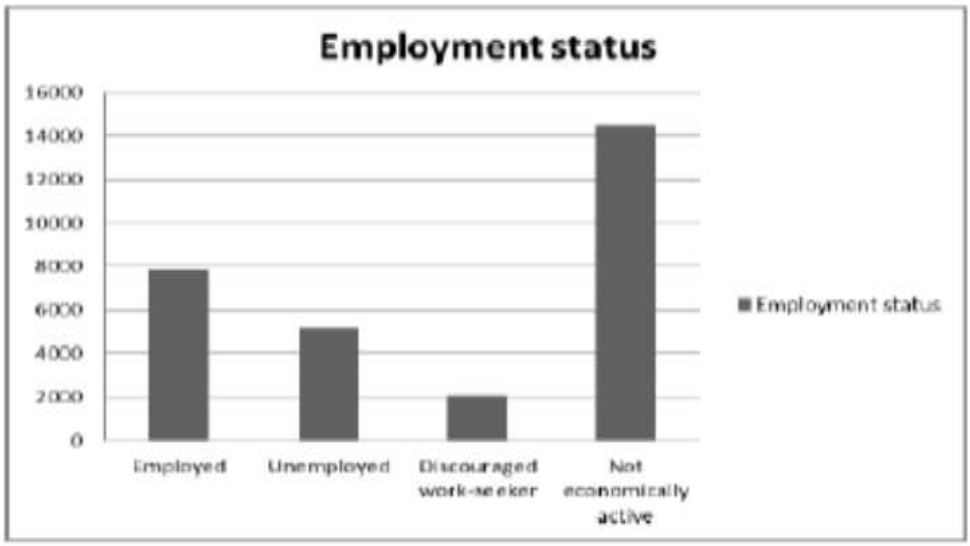
Those with Grade 12 constitute 12.83% while those higher than Grade 12 only constitute 1.64%. There are a limited number of skilled people from which the labour market can draw skills/expertise from.



Graph 1: Education Levels

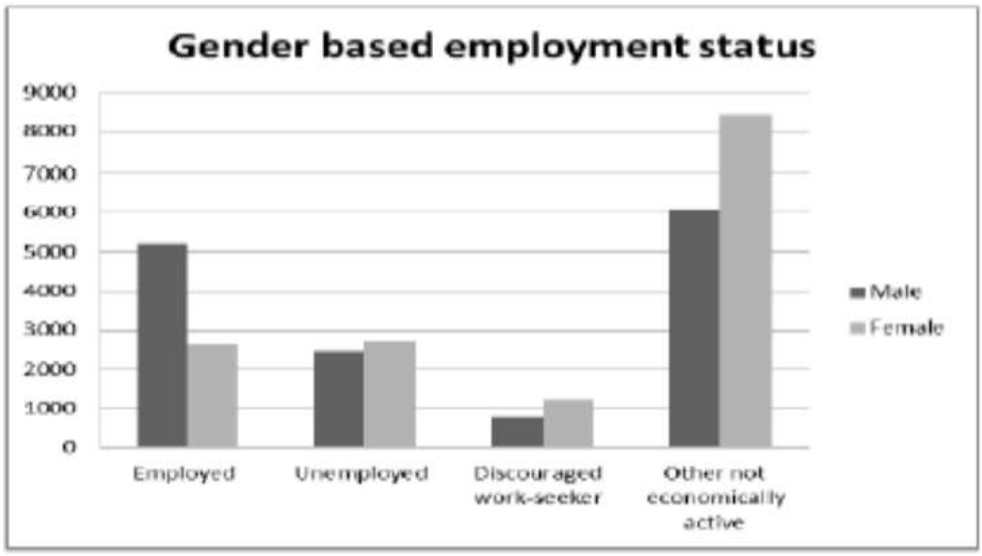
Employment Profile

The number of those who are not economically active is very high, which means a large portion of the population is highly dependent on social grants or on those that work. The number of employed people has increased from 5 924 people (2001) to 7 841 (2011). Thus the unemployment rate has decreased from 45.3% (2001) to 39.7% (2011).



Graph 1: Employment Status

The Stats SA 2011 indicates that more men are employed than their female counterparts. Furthermore women are the most discouraged work seekers. Additionally, the economical not active female population is also higher than their male counterparts. There is a need to have initiatives that make it easy for women to find employment.



Graph 2: Gender Based employment status

Income Profile

The majority of people in Dikgatlong Local Municipality do not generate an income, followed by those who get below R400 per month. Approximately 63% of the population live below the poverty line (R500). "Income variable is one of the variables that measure individual and household welfare. It is important variables that assists in generating indicators relating to poverty and development" (Statistics SA, 2012). Such information is important, as it assist in facilitating planning and the allocation of resources.

Income	Population	Percentage
No income	20 368	43.48
R1 – R400	9 013	19.24
R401 – R800	1 596	3.41
R801 – R1 600	7 759	16.55
R1 601 –R3 200	2 188	4.67
R3 201 – R6 400	1 248	2.66
R6 401 – R12 800	883	1.89
R12 801 – R25 600	435	0.93
R25 601 – R51 200	110	0.23
R51 201 – R102 400	23	0.05
R102 401 –R204 800	15	0.03
R204 801 or more	14	0.03
Unspecified	2 936	6.27
Not Applicable	262	0.56
Total	**46 841**	**100**

Table 7. Income Distribution

Infrastructure

"Good urban environments are, by definition, convenient. They allow inhabitants to conduct daily activities quickly and easily. Inconvenient environments, on the other hand, impose on lifestyles, reduce choices and

increase costs. Access lies at the heart of convenience" (Redbook, 2000: 3). Settlements that perform well are settlements that are convenient and give people access to facilities (Redbook). The presence of the social facilities to the residents of Dikgatlong Local Municipality gives them a sense of belonging who do not have. Below is an overview of the facilities that each ward has.

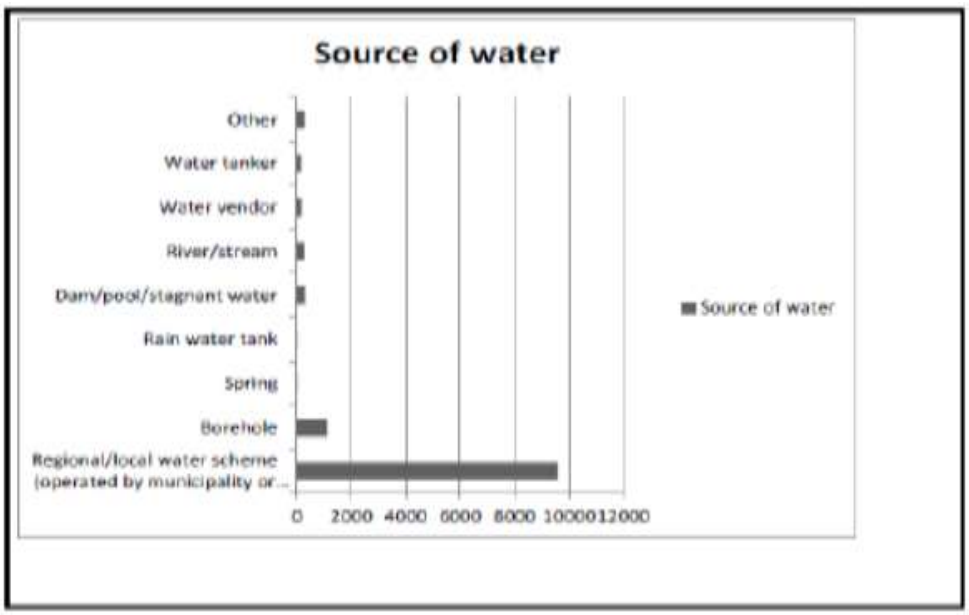
Ward	Educational	Library	Health Services	Recreational	Safety	Community Facilities
1 Mataleng	3 Schools	1	Clinic	Sport Complex	-	Community Hall
2 Blikkiesdorp, De Beershoogte	3 Schools, 3 ECD's	1	Clinic	Swimming Pool	Magistrate Court	Community Hall
3 Rooirant, Makweteng, Pniel, Spitskopweg	2 Schools, 1 ECD	-	Hospital	Resort	Police Station	-
4 Windsorton, Kutlwano, Hebronpark, Stilwater	3 Schools	1	Clinic	Park	Police Station	2
5 Gong Gong, Keisekama, Longlands	2 Schools, 1 ECD	-	Clinic	-	-	-
6 Blikfontein, Koopmansfontein, Rooikoppies	2 Schools, 3 ECDs	1	-	-	Police Station	Community Hall
7 Delportshoop, Tidimalo, 7de Laan	2 Schools, 3 ECDs	-	Clinic	Sport Complex	-	Community Hall

Table 8. Social Facilities

Housing

The population of the municipal area lives in three different types of dwellings; formal, informal and traditional. The formal dwellings constitutes of 6 793 households which is 71.9% of the total number of households in the area. This is slightly lower than the district and Magareng, which have 80% and 78.9% respectively. More than a tenth (12.8%) of the households resides in informal and traditional houses. Each household has an average of 3.8 people.

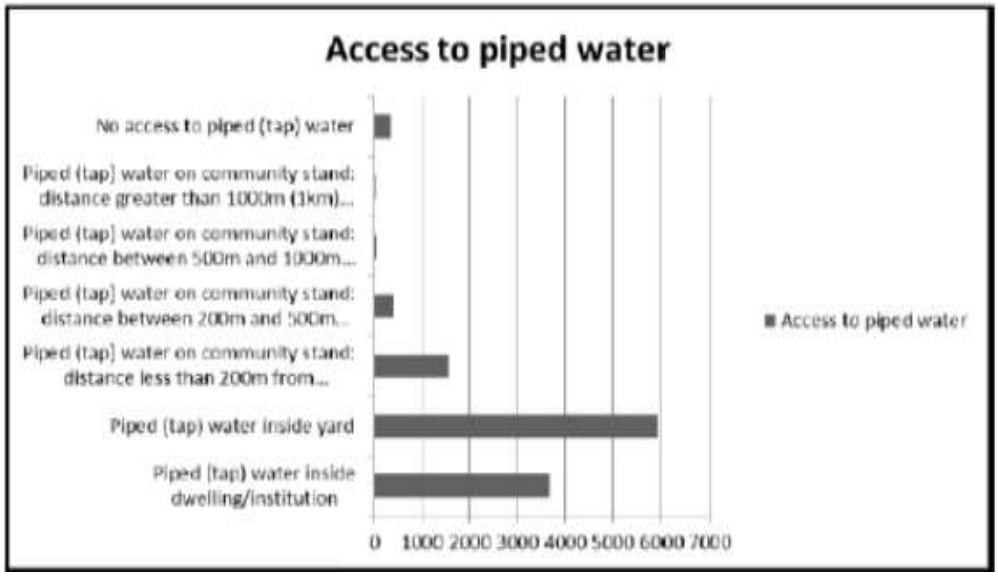
Access to clean water and proper sanitation are key environmental elements that affect health outcomes of households. From the graph below it is evident that a large number of households receive water from a regional/local water scheme. However there are still those households who drink water from the river/stream, dam/pool/stagnant water and those that could not be ascertained as to where they get their water from. Drinking water that has not been purified can make the households vulnerable to a number of communicable diseases such as diarrhoea. The municipality is the water service authority for Ward 6, 7 and a portion of Ward 5. The rest of the municipal area is supplied with water by Sedibeng Water.



Graph 3: Source of water

Access to Water

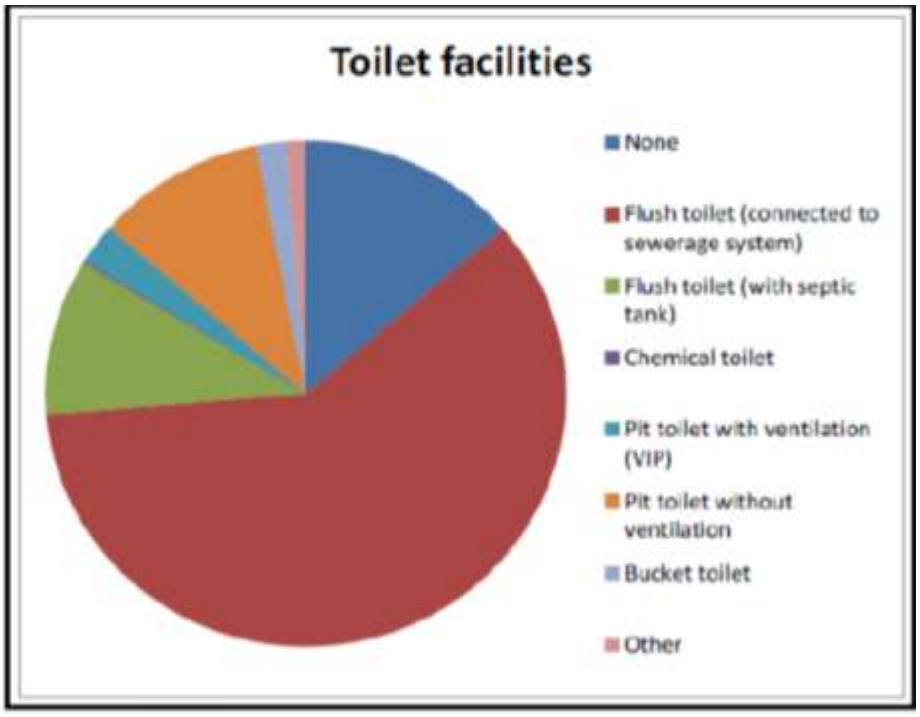
The majority of households (5 935) have access to piped water inside their yard, followed by those who have access to piped water inside their dwelling (3 670). The concern is for those households that must travel more than 1km (more than 20 minutes) to access a community piped water stand (0.24%), as it technical indicates that such service is not accessible. The concern is also for those who have access to tap water (2.77%), as they might be drinking water that is un-purified and not good for health purposes.



Graph 4: Access to piped water

Sanitation

The Millennium Development Goal states the need for "sustainable access to safe drinking water and basic sanitation". 13.72% of households in the Dikgatlong LM do not have access to basic sanitation, while 1.84% still uses the bucket toilet. The 13.72% of none access, is higher than the Provincial one which is 8.04% of households with no access to basic sanitation.



Graph 5: Toilet facilities

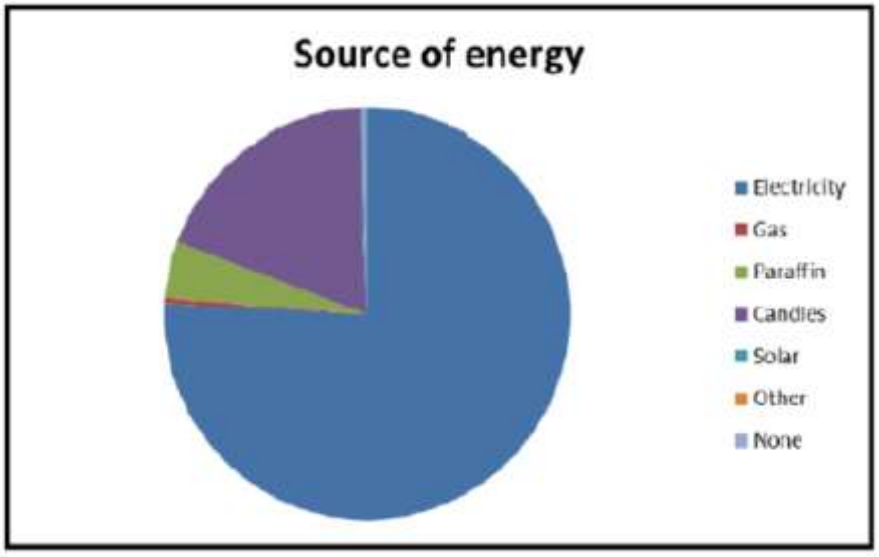
From the table below it is clear that Ward 3 and Ward 5 have the highest number of households with no access to sanitation, while Ward 2 and Ward 7 have the highest number of households who still use the bucket system.

Ward	None	Bucket Toilet
Ward 1 Mataleng	78	4
Ward 2 Blikkiesdorp De Beershoogte	87	58
Ward 3 Rooirant Makwetang Pniel Spitskopweg	533	27
Ward 4 Windsorton Kutlwano Hebronpark Stilwater	202	3
Ward 5 Gong Gong Keisekama Longlands	484	22
Ward 6 Blikfontein Koopmansfontein Rooikopples	158	18
Ward 7 Deloportshoop Tidimalo 7de Laan	99	86

Table 9. Sanitation Analysis

Electricity

There has been an improvement on the energy use across the whole country. The majority of households (75.86%) use electricity as the source of energy for lighting, this was previously 68.5% (in 2001). The number of households that use candles has also decreased from 32% to 18.66% as well as those that use gas and paraffin. However, there seems to be no visible efforts of using solar energy, to decrease the dependency of electricity.



Graph 6: Source of energy

The unemployment rate in Dikgatlong is lower than the province and country; it is currently estimated at 27.5% and 28.2% respectively. However, the statistics indicates that the unemployment in Dikgatlong

has increased by 1.4% since 1996. Of the 22 581 persons falling under the economically active group, only 26.2% are employed. This can be partly attributed to the lack of basic education and basic skills. A third or 32.1% of the educable population (5 to 65 years) have no schooling or some primary schooling.

Unlike Magareng and FBDM, whereby community and social sectors provide work to more than a quarter of the currently employed people, in Dikgatlong 26.2% of the employed portion of the labour forces is mainly employed by Agriculture and Mining sectors. Furthermore, over 60% (25 494) of the population of the area have no income and only 28.7% have income. Of the 28.7% 9 271 persons earn less than R3 200 per month.

(b) Description of the current land uses

(1) *Land Use before Prospecting / Mining:*

Currently, the major land uses in the area are mining and agriculture. According to AGIS, the land capability for the study site is non-arable with moderate potential for grazing and wildlife.
The grazing capacity is 12 ha/LSU, with the agricultural region being demarcated for cattle farming. The study area also falls within the North western cattle and game ranching Livelihood Zone, with sections along the river overlapping with the Vaal-Harts irrigated crops Zone.

The study area is mainly used as natural pastures for livestock grazing, but there are also a few irrigated crops. Existing infrastructure includes homesteads, a public gravel road, farm roads and tracks, grazing camps, and Eskom powerlines. Evidence of extensive disturbances from historic mining activities are also present. The remaining areas are still in pristine conditionand used for natural pastures. (information taken out of the ecological study by Boscia Ecological Consultants Dr. Betsie Milne Appedix 4).

It would however be feasible to determine if there are any economically viable minerals to mine as mining can also generate income for the property owner that can be used for further development of the property.

The prospectors will have to promote rehabilitation strategies to ensure that open pits and trenches are backfilled. There will be infield screening to ensure that all oversize material is deposited back into the pits and trenches. This material should be covered with the overburden (where available), and topsoil that has been previously put aside for this purpose. The post-prospecting land use should be determined so that

the development strategies of the farm can still be continue beyond the prospecting and mining of the area should the area be viable for mining.

(2) Evidence of Disturbance:-

The disturbed areas include those areas that have been subjected to historic mining activities and are primarily found in the south-west of the study area. It is presented as a monotonous grassland, intermixed with a high density of weeds and clumps of encroaching shrub species.

(3) Existing Structures: -

Existing infrastructure includes homesteads, a public gravel road, farm roads and tracks, grazing camps, and Eskom powerlines

(c) Description of specific environmental features and infrastructure on the site

The infrastructure on site is comprehensively discussed in section d(ii) as part of the prospecting methodology discussion, as well as in section g as part of the prospecting footprint description. Furthermore, a comprehensive description of the environment was presented in section g (iv) (A) as part of the baseline report.

(d) Environmental and current land use map

(Show all environmental, and current land use features)

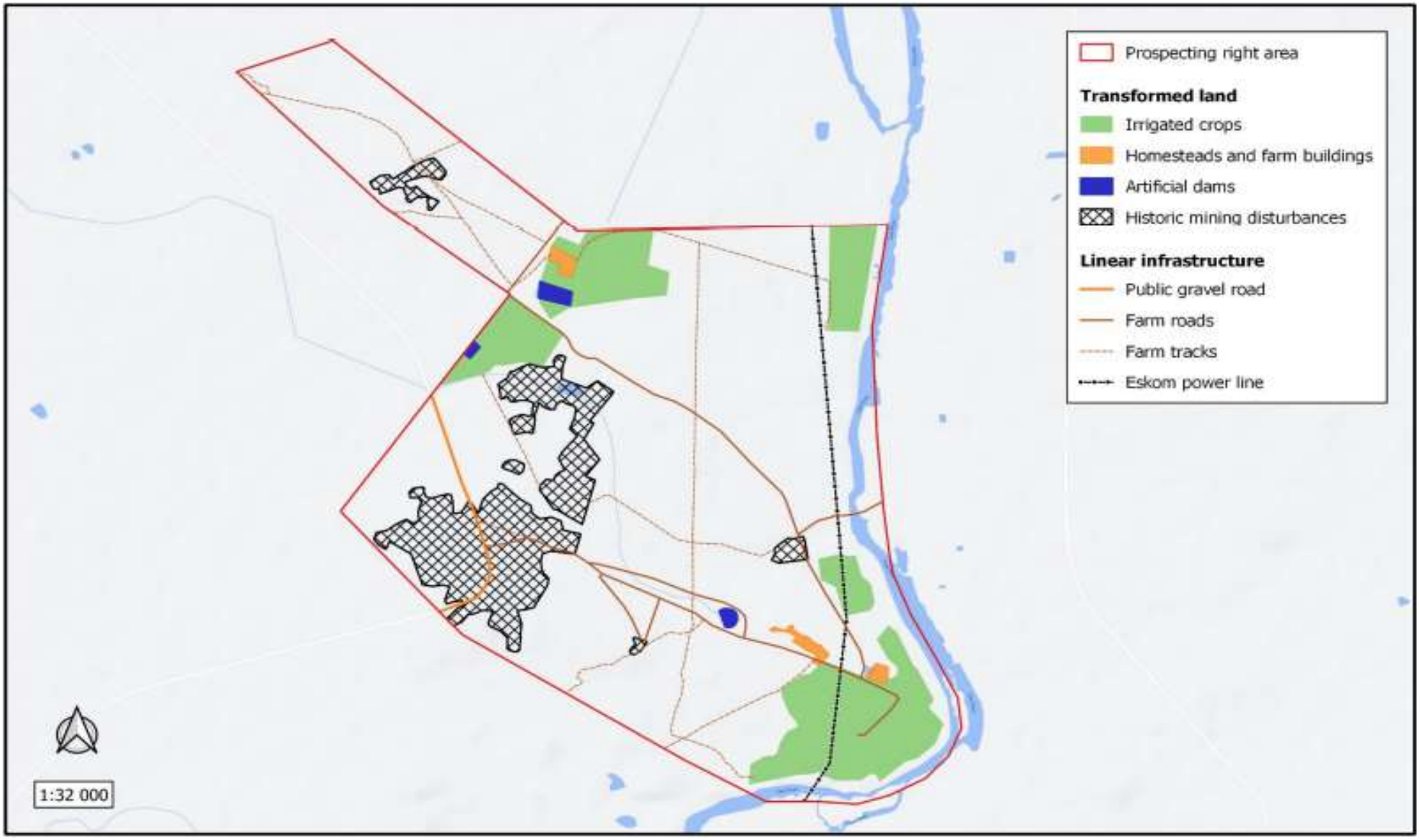


Figure 24. The existing land use features on the prospecting right area.

v) Impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts

(Provide a list of the potential impacts identified of the activities described in the initial site layout that will be undertaken, as informed by both the typical known impacts of such activities, and as informed by the consultations with affected parties together with the significance, probability, and duration of the impacts. Please indicate the extent to which they can be reversed, the extent to which they may cause irreplaceable loss of resources, and can be avoided, managed or mitigated)

Environmental Factor	Nature of Impact	Significance	Probability	Duration	Consequence Extent	Management / mitigation
PHYSICAL						
Geology and Mineral Resource	Sterilisation of mineral resources	Very low	Highly unlikely	Residual	insignificant Local	Ensure that optimal use is made of the available mineral resource.
Topography	Changes to surface topography Development of infrastructure; and residue deposits.	Low Medium	Possible for life of Operation	Residual	Low On site	• Prospecting continuously, if possible and does not influence prospecting and safety requirements. • Employ effective rehabilitation strategies to restore surface topography of prospecting areas and plant site. • Stabilise the mine residue deposits. • All temporary infrastructures should be demolished during closure.
Soils	**Soil Erosion** Construction of infrastructure; topsoil removal; potential runoff.	Low Medium	Possible for life of Operation	Residual	Low Medium On-site	• Re-establishment of plant cover on disturbed areas must take place as soon as possible, once activities in each area have ceased.

						• Bare ground exposure should be minimised in terms of the surface area and duration. • The operation must co-ordinate different activities in order to optimise the excavated pits and trenches and thereby prevent repeated and unnecessary excavations and disturbances to the vegetation and soil. • Construction/excavations during the rainy season (November to March) should be monitored and controlled. • Run-off from exposed ground should be controlled with flow retarding barriers. • All stockpiles must be kept as small as possible, with gentle slopes (18 degrees) in order to avoid excessive erosional induced losses. • Excavated and stockpiled soil material are to be stored on the higher lying areas of the footprint area and not in any natural storm water run-off channels or any other areas where it is likely to cause erosion, or where water would naturally accumulate.

						• Regular audits carried out to identify areas where erosion is occurring (incl. linear activities such as roads and pipelines); followed by appropriate remedial actions.
	Nature of Impact	Significance	Probability	Duration	Consequence Extent	Management / mitigation
	Loss of soil fertility During the removal of topsoil; stockpiling.	Low-Medium	Possible for life of operation	Residual	Low Medium On-site	• Topsoil must be removed and stockpiled before the overburden is excavated. • Topsoil should preferably be protected with tarps to regulate air flow and prevent erosion and leaching. • Topsoil stockpiles must be kept as small as possible in order to prevent compaction and the formation of anaerobic conditions. • Topsoil must be stockpiled for the shortest possible timeframes (ideally no longer than two months) in order to ensure that the quality of the topsoil is not impaired. • Topsoil must not be handled when the moisture content exceeds 12 %. • Topsoil stockpiles must be kept separate from sub-soil overburden.

						• The topsoil should be replaced as soon as possible on to the backfilled areas, thereby allowing for the re-growth of the seed bank contained within the topsoil.
	Nature of Impact	Significance	Probability	Duration	Consequence Extent	Management / mitigation
	Soil pollution Spillage of hazardous material; runoff.	Low-Medium	Possible for life of operation	Residual	Low-Medium On site	• Refuelling must take place in well demarcated areas and over suitable drip trays to prevent soil pollution. • Spill kits to clean up accidental spills from earthmoving machinery must be well-marked and available on site. • Workers must undergo induction to ensure that they are prepared for rapid clean-up procedures. • All facilities where dangerous materials are stored must be contained in a bund wall. • Vehicles and machinery should be regularly serviced and maintained.
Land Capability	Loss of land capability through topsoil removal, disturbances and loss of fertility.	Low-Medium	Possible for life of operation	Residual	Low-Medium On-site	• Employ appropriate rehabilitation strategies to restore land capability.

Land use	Loss of land use due to poor placement of surface infrastructure and ineffective rehabilitation	Low-Medium	Possible for life of operation	Residual	Low Medium On-site	• Carefully plan the placement of infrastructure and employ rehabilitation strategies to restore land capability.
Ground Water Quantity	Nature of Impact	Significance	Probability	Duration	Consequence Extent	Management / mitigation
	Hydrocarbon spills from vehicles and fuel storage areas may contaminate the groundwater resource locally	Low-Medium	Possible for life of operation	Residual	Low-Medium Local	• Staff at Workshop areas, yellow metal laydown zones and fuel storage areas should be sufficiently trained in hydrocarbon spill response. • Each area where hydrocarbons are stored or likely to spill should be equipped with sufficient spill response kits and personnel, contaminated soil should be disposed of correctly at a suitable location.
Environmental Factor	Nature of Impact	Significance	Probability	Duration	Consequence Extent	Management / mitigation
Surface Water	• Ground works and stripping of vegetation resulting in a changed land profile. • Runoff from stockpiled soil and	Low Medium	Possible for life of operation	Residual	Low -Medium Local	Water Quality deterioration: change in water quality is caused by a change in natural conditions and/or an enhancement of pollution from sources. Dirty storm water trenches should be inspected regularly (once before the rainy season and after each occurrence of a storm) to

	vegetation may contain high levels of silt. • Significant levels of dust may emanate from the use of heavy vehicles which in turn will impact on runoff water quality. • Materials used may impact negatively on the runoff water quality.					clean the trench from excess soil particles to prevent overtopping of the channel wall during a sudden storm which will result in mixing of the dirty and clean water systems. Mitigation measures (or safety precautions) that are taken in order to eliminate any risk the project area could have on the natural, cultural and social environment of the concerned area and that must be implemented during the different phases i.e. construction, operational and post closure to minimize the impacts are as follows: • Only environmentally friendly materials must be used to minimize pollution of surface water runoff and/or underground water resources. • Pipe leakages should be minimized. • Proper clean and dirty water separation techniques must be used to ensure uncontaminated water returning to the environment.
	• Spillages that may occur on access and haul roads may impact negatively on surface water quality. This issue is dealt with in the EMP.	Low Medium	Possible for life of operation	Residual	Low -Medium Local	

	• A high potential of soil erosion exists due to an increased percentage of bare surfaces.					• Non prospecting waste i.e. grease, lubricants, paints, flammable liquids, garbage, historical machinery and other combustible materials generated during activities should be placed and stored in a controlled manner in a proper designed area.
	• Possible leaching of polluted soil through infiltration and runoff resulting in surface water pollution. • Removal of vegetation could lead to erosion and sediment transportation. • Significant dust levels will emanate from the use of heavy vehicles.	Low Medium	Possible for life of operation	Residual	Low -Medium Local	• The topography of rehabilitation disturbed areas must be rehabilitated in such a manner that the rehabilitated area blends in naturally with the surrounding natural area. This will reduce soil erosion and improve natural re-vegetation.
Environmental Factor	Nature of Impact	Significance	Probability	Duration	Consequence Extent	Management

Indigenous Flora	**Loss of and disturbance to indigenous vegetation** Construction of roads, plant site, as well as other necessary infrastructure; placement of stockpiles; and the clearing of vegetation for prospecting, materials storage and topsoil stockpiles; vehicular movement.	Low - Medium	Certain for life of operation	Residual	Low Medium On-site	• Implement best practise principles to minimise the footprint of transformation. • Encourage proper rehabilitation of excavated areas, by effective backfilling and returning the stockpiled topsoil. • Encourage the growth of natural plant species by sowing indigenous seeds or by planting seedlings. Seeds can be acquired from renukaroo@gmail.com. • Ensure measures for the adherence to the speed limit to minimise dust plumes. • Apply for permits to authorise the large-scale clearance of indigenous vegetation from DENC at least three months before such activities will commence.
	Loss of flora with conservation concern Removal of listed or protected plant species; during Construction of roads, plant site,	Low - Medium	Possible for life of operation	Residual	Low Medium On-site	• The footprint areas of the prospecting activities must be scanned for Red Listed and protected plant species prior to excavations. • It is recommended that these plants are identified and marked prior to intended activity.

	as well as other necessary infrastructure; the placement of stockpiles; and clearing of vegetation for prospecting.					• These plants should ideally be incorporated into the design layout and left in situ. • However, if threatened by destruction, these plants should be removed (with the relevant permits from DAFF and/or DENC) and relocated if possible. • A management plan should be implemented to ensure proper establishment of ex situ individuals, and should include a monitoring programme for at least two years after re-establishment in order to ensure successful translocation. • The designation of a full-time ECO is vital to render guidance to the staff and contractors with respect to suitable areas for all related disturbance, and must ensure that all contractors and workers undergo Environmental Induction prior to commencing with work on site. The environmental induction should occur in the appropriate languages for the workers who may require translation.

						• All those working on site must be educated about the conservation importance of the flora occurring on site.
	Introduction or spread of alien species Clearing of vegetation; prospecting activities	Low-Medium	Possible, infrequently	Residual	Low Medium Local	• Minimise the footprint of transformation. • Encourage proper rehabilitation of excavated areas. • Encourage the growth of natural plant species. • Mechanical methods of control to be implemented extensively. • Annual follow-up operations to be implemented.
	Encouragement of bush encroachment Clearing of vegetation; disturbance through prospecting activities.	Low	Low likelihood, temporarily	Residual	Low On-site	• Minimise the footprint of transformation. • Encourage proper rehabilitation of disturbed areas. • Encourage the growth of a diverse selection of natural plant species. • Mechanical methods of control to be implemented selectively. • Annual follow-up monitoring to be implemented.

Fauna	**Loss, damage and fragmentation of natural habitats** Clearance of vegetation; Prospecting activities	Medium – High	Possible for life of operation	Residual	Medium High Regional	• All activities associated with the prospecting operation must be planned, where possible in order to encourage faunal dispersal and should minimise dissection or fragmentation of any important faunal habitat type. • The extent of the earmarked area should be demarcated on site layout plans. No staff, contractors or vehicles may leave the demarcated area except those authorised to do so. • Those pristine areas surrounding the earmarked area that are not part of the demarcated area should be considered as a no-go zone for employees, machinery or even visitors. • Employ sound rehabilitation measures to restore the characteristics of any affected habitats.
	Disturbance, displacement and killing of fauna Vegetation clearing; increase	Low	Possible, for life of operation	Residual	Low On-site	• Careful consideration is required when planning the placement for stockpiling topsoil and the creation of access routes in order to avoid the destruction of habitats and

	in noise and vibration; human and vehicular movement on site resulting from prospecting activities.					minimise the overall prospecting footprint. • The extent of the proposed prospecting should be demarcated on site layout plans. • The appointment of a full-time ECO must render guidance to the staff and contractors with respect to suitable areas for all related disturbance, and must ensure that all contractors and workers undergo Environmental Induction prior to commencing with work on site. • All those working on site must undergo environmental induction with regards to fauna and in particular awareness about not harming or collecting species such as snakes, tortoises and owls which are often persecuted out of superstition. • All those working on site must be educated about the conservation importance of the fauna and flora occurring on site. • The environmental induction should occur in the appropriate languages for the

						workers who may require translation. • Reptiles and amphibians that are exposed during the clearing operations should be captured for later release or translocation by a qualified expert. • Employ measures that ensure adherence to the speed limit.
Air Quality	Sources of atmospheric emission associated with the prospecting operation are likely to include fugitive dust from materials handling operations, wind erosion of stockpiles, and vehicle entrainment of road dust.	Low	Certain for life of operation	Decommissioning	Low Local	Effective soil management; identification of the required control efficiencies in order to maintain dust generation within acceptable levels.
SOCIAL SURROUNDINGS						
Environmental Factor	Nature of Impact	Significance	Probability	Duration	Consequence Extent	Management
Noise Impacts	Clearing of footprint areas, stripping of	Low	Possible Infrequently	Decommissioning	Low Local	Equipment and/or machinery which will be used must comply with the manufacturer's

	stockpiling of topsoil					specifications on acceptable noise levels
	Construction activities Noise increase at the prospecting site.	Low	Possible Infrequently	Decommissioning	Low Local	Equipment and/or machinery which will be used must comply with the manufacturer's specifications on acceptable noise levels
	Construction of internal Roads	Low	Possible Infrequently	Decommissioning	Low Local	Equipment and/or machinery which will be used must comply with the manufacturer's specifications on acceptable noise levels
	Assembly plant equipment Noise increase at the prospecting site.	Low	Possible Infrequently	Decommissioning	Low Local	Equipment and/or machinery which will be used must comply with the manufacturer's specifications on acceptable noise levels
	Construction of the Mine Residue dump, soil stock pile and material stock pile. Noise increase at the prospecting site.	Low	Possible Infrequently	Decommissioning	Low Local	Equipment and/or machinery which will be used must comply with the manufacturer's specifications on acceptable noise levels
	Clearing of new open cast prospecting	Low	Possible Infrequently	Decommissioning	Low Local	Equipment and/or machinery which will be used must comply with the manufacturer's

	areas, stripping and stockpiling of topsoil. Noise increase at the prospecting site.					specifications on acceptable noise levels
	Diesel generators Noise increase at the prospecting site.	Low	Possible Infrequently	Decommissioning	Low Local	Equipment and/or machinery which will be used must comply with the manufacturers specifications on acceptable noise levels.
	Additional traffic to and from the mine	Low	Possible Infrequently	Decommissioning	Low Local	Equipment and/or machinery which will be used must comply with the manufacturers specifications on acceptable noise levels
	Maintenance activities at the different sites.	Low	Possible Infrequently	Decommissioning	Low Local	Equipment and/or machinery which will be used must comply with the manufacturers specifications on acceptable noise levels
	Back fill of prospecting footprint area	Low	Possible Infrequently	Decommissioning	Low Local	Equipment and/or machinery which will be used must comply with the manufacturers specifications on acceptable noise levels
	Planting of grass and vegetation at the rehabilitated areas	Low	Possible Infrequently	Decommissioning	Low Local	Equipment and/or machinery which will be used must comply with the manufacturers specifications on acceptable noise levels

						Planting of grass and/or vegetation should be limited to daytime only
	Removal of infra-structure	Low	Possible Infrequently	Decommissioning	Low Local	Equipment and/or machinery which will be used must comply with the manufacturers specifications on acceptable noise levels Removal of infrastructure should be limited to daytime only. Noise survey to be carried out to monitor the noise levels during these activities.
Visual impacts	Potential visual impact on gravel road	Low Regional	Certain	Construction, Operation and Decommissioning	Low Local Site	The design of the proposed prospecting development will determine the visual impact. As the visual impact would be low.
	Potential Visual Impact on the surrounding land users/ residents	Low Regional	Highly Likely	Construction, Operation and Decommissioning	Low Local Site	The design of the proposed prospecting development will determine the visual impact.
	Potential visual impact of the proposed development on the Sense of Place	Low Regional	Highly Likely	Construction, Operational and Decommissioning	Low Local Site	Design of the proposed development can ensure that the development forms part of the area and is aesthetically pleasing.
	Potential visual impact of the proposed development on the construction	Low Regional	Highly Likely	Construction	Low Local Site	Wetting of exposed areas should be undertaken as required to prevent dust pollution having a negative visual impact.

	phase of the surrounding land users in close proximity					• Ensure that the design fits into the surrounding environment and it is aesthetically pleasing; • Ensure that rubble, litter and disused construction materials are managed and removed regularly; • Ensure that all infrastructure and the site and general surrounds are maintained in a neat and appealing way;
	Potential visual impact of the proposed development on the operational phase of the surrounding land users in close proximity.	Low Regional	Highly likely	Operational	Low Local Site	Wetting of exposed areas should be undertaken as required to prevent dust pollution having a negative visual impact. • Ensure that the design fits into the surrounding environment and it is aesthetically pleasing. • Ensure that all infrastructure and the site and general surroundings are maintained in a neat and appealing way; • Rehabilitation of disturbed areas and re-establishment of vegetation;
Traffic	Potential negative impacts on traffic safety and deterioration of the existing road networks.	Low	Low Likelihood	Decommissioning	Low Local	Utilise existing access roads, where applicable; implement measures that ensure adherence to traffic rules.

Heritage resources	The Deterioration of sites of cultural and heritage importance.	Medium	Uncertain	Decommissioning	Low Local	Any heritage and cultural resources (e.g. ruins, historic structures, etc.) must be protected and preserved by the delineation of a no-go zone. Should any further resources be disturbed, exposed or uncovered during site preparations, these should immediately be reported to an accredited archaeologist. Burial remains should not be disturbed or removed until inspected by an archaeologist.
Environmental Factor	Nature of Impact	Significance	Probability	Duration	Consequence Extent	Management
Socio-Economic	**Population Impacts** Employment Opportunities and skills Inequities	Medium Positive	Decommis-sioning	Start-up and Construction	Medium Positive Local	• Training of potential future employees, contract workers and/or community members should focus on prospecting related skills which would furthermore equip trainees/beneficiaries with the necessary portable skills to find employment at the available employment sectors within the study area. Multi-skilling is thus not necessarily the preferred training and skills development method. • Training courses should be accredited and certificates obtained should be acceptable by other related industries.

	Impact on daily living and movement patterns	Low Negative	Probable	Start-up and Construction	Low Negative Local	• Dust suppression methods should be strictly implemented if and where required • All vehicles should be in a good condition and adhere to the road worthy standards • Dust creation should be kept to the minimum by adhering to the speed limits on the gravel road • The construction of additional access roads should be limited. • Speeding of vehicles must be strictly monitored.
	Safety and Security Risks	Low Negative	Highly Probable	Construction	Low Negative Local	• A Fire/Emergency Management Plan should be developed and implemented at the outset of the prospecting operation. • Open fires for cooking and related purposes should not be allowed on site. • Appropriate firefighting equipment should be on site and workers should be appropriately trained for fire fighting • The prospecting area should be fenced or access to the area should be controlled to avoid

						animals or people entering the area without authorisation. • The prospecting site should be clearly marked and "danger" and "no entry" signs should be erected. • Speed limits on the local roads surrounding the prospecting sites should be enforced. • Speeding of prospecting vehicles must be strictly monitored • Local procurement and job creation should receive preference.
	Health Impacts	Low Negative	Highly probable	Construction	Low Negative Local	• Maximise the employment of locals where possible • First aid supplies should be available at various points at the prospecting site • The general health of prospecting workers should be monitored on an on-going basis
	Community Infrastructure Needs Impact on Infrastructure and Services	Low Negative	Highly probable	Construction	Low Negative Local	• Maximise the employment of locals where possible • Maintenance of the roads frequently used by prospecting traffic e.g. R386 should be discussed and negotiated with the Northern Cape Department of Roads and Public Works

	Heritage Features	Low Negative	Highly probable	Construction	Low Negative Local	• Any heritage features (e.g. buildings and/or artefacts) on site must be protected and monitored • Should it be necessary, such heritage features should be assessed and be recorded by an accredited Heritage Impact Specialist or archaeologist
	Intrusion Impacts Visual Impact and Sense of Place	Low Negative	Probable	Construction	Low Negative Local	• The prospecting site should be kept litter free • Site rehabilitation on certain sections of the site should occur as soon as the prospecting process allows • The recommendations made by the Visual Impact Assessment should be adhered to.
	Noise Impact	Low Negative	Probable	Construction	Low Negative Local	• The mitigation measures of the Noise Impact Assessment should be implemented • Vehicles should be in a good working order • Prospecting activities should be kept to normal working hours e.g. 7 am until 5 pm during weekdays
	Intrusion Impacts Visual Impact and Sense of Place	Low Negative	Possible for life of operation	Operational	Low Negative Local	• Recommendations and mitigation measures as part of the EMP should be strictly implemented.

						• Prospecting areas should be rehabilitated as soon as the Prospecting Works Programme allows
	Noise Impact	Low Negative	Probable	Operational	Low Negative Local	• Recommendations and mitigation measures proposed by the Noise Impact Assessment should be strictly implemented • Noise generating activities should be kept to normal working hours (e.g. 7 am until 5 pm) where possible
Interested and Affected Parties	Loss of trust and a good standing relationship between the IAP's and the prospecting company.	Low to medium	Possible	Construction, Operational and Decommissioning	Low Local	Ensure continuous and transparent communication with IAP's

vi) Methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks(Describe how the significance, probability, and duration of the aforesaid identified impacts that were identified through the consultation process was determined in order to decide the extent to which the initial site layout needs revision)

Methodology used in determining and ranking the nature, severity, consequences, extent, duration and probability of potential environmental impacts and risks

The Different environmental components on which the project (can) have an impact are:

1. **Geology**
2. **Topography**
3. **Soil**
4. **Land Capability**
5. **Land Use**
6. **Flora (Vegetation)**
7. **Fauna**
8. **Surface Water**
9. **Ground Water**
10. **Air Quality**
11. **Noise and vibration**
12. **Archaeological and Cultural Sites**
13. **Sensitive Landscapes**
14. **Visual Aspects**
15. **Socio-Economic Structures**
16. **Interested and Affected Parties**

Impact Assessment

Before the impact assessment could be done the different project Activities/infrastructure components were identified.

1	**Processing Plant:** 2 X 16feet
2	**Ablution Facilities:** In terms of sewage the decision was made to use chemical toilets which can be serviced regularly by the service provider.
3	**Clean & Dirty water system: Berms** It is anticipated that the operations will establish storm water control berms and trenches to separate clean and dirty water on the prospecting site.
4	**Fuel Storage facility (Concrete Bund walls and Diesel tanks):** It is anticipated that the operation will utilize 2 x 23 000 litre diesel tank. This tank must be placed in bund walls, with a capacity of 1.5 times the volume of the diesel tank. A concrete floor must be established where the re-fuelling will take place.
5	**Prospecting Area:** Area applied for to pit and trench for diamonds (bulk sampling).
6	**Salvage yard (Storage and laydown area).**
7	**Product Stockpile area.**
8	**Waste disposal site** Waste disposal site (domestic and industrial waste): It is anticipated that the operation will establish a dedicated, fenced waste disposal site with a concrete floor and bund wall. The following types of waste will be disposed of in this area: • Small amounts of low-level hazardous waste in suitable receptacles. • Domestic waste. • Industrial waste.
9	**Roads (both access and haulage road on the prospecting site):** **Access** Although it is recommended that the operation utilize existing roads as far as possible, it is anticipated that the prospecting operation will create an additional 1.5 km of roads, with a width of 5 meters. The current access road is deemed adequate for a service road into the prospecting site.
10	**Temporary Workshop Facilities and Wash bay.**
11	**Water distribution Pipeline.**
12	**Water tank :** It is anticipated that the operation will establish 1 x 10 000 litre water tanks with purifiers for potable water.

The criteria used to assess the significance of the impacts are shown in the table 9 below/overleaf. The limits were defined in relation to prospecting characteristics. Those for probability, intensity/severity and significance are subjective, based on rule-of-thumb and experience. Natural and existing mitigation measures were considered. These natural mitigation measures were defined as natural conditions, conditions inherent in the project design and existing management measures, which alleviate impacts. The significance of the impacts was calculated by using the following formula:

(Severity + Extent + Duration) x Probability weighting

For the impact assessment, the different project activities and associated infrastructure were identified and considered in order to identify and analyse the various possible impacts.

Table 9. Significance of impacts is defined as follows.

SIGNIFICANCE				
Colour Code	**Significance rating**	**Rating**	**Negative Impact**	**Positive Impact**
	Very low	3 -16	Acceptable/Not serious	Marginally Positive
	Low	17 - 22	Acceptable/Not serious	Marginally Positive
	Medium-Low	23 -33	Acceptable/Not desirable	Moderately Positive
	Medium	34 - 48	Generally undesirable	Beneficial
	Medium-High	49 - 56	Generally unacceptable	Important
	High	57 - 70	Not Acceptable	Important
	Very High	90 - 102	Totally unacceptable	Critically Important

Significance of impacts is defined as follows:

Very Low - Impact would be negligible. Almost no mitigation and/or remedial activity would be needed, and any minor steps which might be needed would be easy, cheap and simple.

Low - Impact would have little real effect. Mitigation and/or remedial activity would be either easily achieved or little would be required or both.

Medium Low- Impact would be real but not substantial within the bounds of those which could occur. Mitigation and/or remedial activity would be both feasible and fairly easily possible.

Medium - Impact would be real but not substantial within the bounds of those which could occur. Mitigation and/or remedial activity would be feasible and possible.

Medium High- Impact would be real but could be substantial within the bounds of those which could occur. Mitigation and/or remedial activity would be both feasible and possible but may be difficult and or costly.

High - Impacts of substantial order. Mitigation and/or remedial activity would be feasible but difficult, expensive, time consuming or some combination of these.

Before any assessment can made the following evaluation, criteria need to be described.

Table 10. Explanation of PROBABILITY of impact occurrence

Weight	Probability of Impact Occurrence	Explanation of Probability
1	Improbable	<20% sure of particular fact or likelihood of impact occurring
2	Low Probability Possible	20 – 39% sure of particular fact or likelihood of impact occurring
3	Probable /Likely	40 – 65% sure of particular fact or likelihood of impact occurring
4	Highly Probable /Likely	66 – 85% sure of particular fact or likelihood of impact occurring
5	Definite	86% - 100% sure of particular fact or likelihood of impact occurring

Table 11. Explanation of EXTENT of impact

Weight	Extent of Impact	Explanation of Extent
1	Footprint	Direct and Indirect impacts limited to the activity, such as footprint occurring within the total site area of impact only.
2	Surrounding Area **Site**	Direct and Indirect impacts affecting environmental elements **within 2 km of site**
3	Local Municipality **Local**	Direct and Indirect impacts affecting environmental elements within the Groblershoop **area**
4	Regional/District **Regional**	Direct and Indirect impacts affecting environmental elements within the **Hay District**
5	**Provincial**	Direct and Indirect impacts affecting environmental elements in the **Northern Cape Province**

Table 12. Explanation of DURATION of impact

Weight	Duration of Impact	Explanation of Duration
1	Temporary (Very Short)	Less than 1 year
2	Short term	1 to 5 years
3	Medium term	6 to 15 years
4	Long term (Life of project)	16 to 50 years
5	Very Long term	Longer than 50 years
6	Permanent	Permanent

Table 13. Explanation of SEVERITY of the impact

Weight	Impact Severity	Explanation of Severity
1	No Impact	There will be no impact at all – not even a very low impact on the system or any of its parts.
2	Very Low	Impact would be negligible. In the cast of negative impacts, almost no mitigation and/or remedial activity would be needed, and any minor steps which might be needed would be easy, cheap and simple. In the case of positive impacts alternative means would almost all likely to be better, if one or a number of ways, then this means of achieving the benefit.
3	Low	Impact would be of a low order and with little real effect. In the case of negative impacts, mitigation and/or remedial activity would be either easily achieved or little would be required or both. In the case of positive impacts alternative means for achieving this benefit would be easier, cheaper, more effective, less time-consuming, or some combination of these.
4	Moderately Severe	Impact would be real but not substantial within the bounds of those which could occur. In the case of negative impacts, mitigation and/or remedial activity would be both feasible and fairly easily possible. In the case of positive impacts other means other means of covering these benefits would be about equal in cost and effort.
5	High Severance	Impacts of substantial order. In the case of negative impacts, mitigation and/or remedial activity would be feasible but difficult, expensive, time consuming or some combination of these. In the case of positive impacts other means of achieving this benefit would be feasible, but these would be more difficult, expensive, time-consuming or some combination of these.
6	Very High Severity	Of the highest order possible within the bounds of impacts which could occur, in the case of negative impacts, there would be no possible mitigation and/or remedial activity to offset the impact at the spatial or time scale for which was predicted. In the case of positive impacts there is no real alternative to achieving the benefit.

vii) The positive and negative impacts that the proposed activity (in terms of the initial site layout) and alternatives will have on the environment and the community that may be affected

(Provide a discussion in terms of advantages and disadvantages of the initial site layout compared to alternative layout options to accommodate concerns raised by affected parties)

During construction and operation of the prospecting, there is a possibility of sterilisation of the mineral reserves and resources due to improper placement of infrastructure. The infrastructure and slimes dam will alter the topography by adding features to the landscape. Topsoil removal and prospecting will unearth the natural topography. The construction of infrastructure and various facilities in the prospecting

area can also result in loss of soil due to erosion. Vegetation where present will be stripped in preparation for placement of temporary prospecting infrastructure, and therefore the areas will be bare and susceptible to erosion. The topsoil that is stripped and piled on surrounding areas can be eroded by wind and rain. The soil will be carried away during runoff. The declared areas will be rehabilitated, but full restoration of soil might only occur over some time, subsequent to the re-establishment of vegetation. Furthermore, improper stockpiling and soil compaction can result in soil sterilisation. Leaching can also occur, resulting in the loss of nutrients.

During the construction and prospecting operation, there is a possibility that equipment might leak oil, thus causing surface spillages. The hydrocarbon soil contamination will render the soil unusable unless they are decontaminated. The storage of fuels on site might have an impact on soil if the tanks that are available on site are not properly monitored and maintained to avoid leakages. Then there is the potential that contaminated soil can be carried through runoff to contaminate water resources and soil stockpiled for rehabilitation. Soil pollution is therefore possible, but through mitigation it can be minimised.

The loss of land capability and land use can occur in two ways. Firstly, through topsoil removal, disturbances and loss of soil fertility; and secondly through the improper placement of infrastructure. The site has a land capability for grazing and limited agriculture, but grazing activities can still be performed in areas not earmarked for prospecting, and with proper rehabilitation the land capabilities and land use potential can be restored.

If oil and fuel spillages occur, then it will seep into the underlying aquifers and contaminate ground water. Improper handling of hazardous material will cause contamination of nearby surface water resources during runoff episodes. Lack of storm control structures will lead to erosion of stockpiles during heavy rains and runoff will carry suspended solids into the downstream environment. This might cause high silt load and affect stream flow.

Construction and prospecting activities on site will reduce the natural habitat for ecological systems to continue their operation. Vehicle traffic generates lots of dust which can reduce the growth success and seed dispersal of many small plant species. It is expected that protected species if present can be destroyed during the bulk sampling operation.

While general clearing of the area and prospecting activities destroy natural vegetation, invasive plants can increase due to their opportunistic nature in disturbed areas. If invasive plant establishes in disturbed areas, it may cause an impact beyond the boundaries of the prospecting site. These alien invasive species are thus a threat to surrounding natural vegetation and can result in the decrease of biodiversity and ecological value of the area. Therefore, if alien invasive species are not controlled and managed, their propagation into new areas could have a high impact on the surrounding

natural vegetation in the long term. With proper mitigation, the impacts can be substantially reduced.

The transformation of natural habitats to prospecting and associated infrastructure will result in the loss of habitat affected individual species, and ecological processes. In turn this will result in the displacement of faunal species dependent upon such habitat. Increased noise and vibration due to prospecting activities will disturb and possibly displace birds and other wildlife. Fast moving vehicles take a heavy toll in the form of road kills of small mammals, birds, reptiles, amphibians and a large number of invertebrates. The construction of the temporary prospecting and associated infrastructure will result in the loss of connectivity and fragmentation of natural habitat. Fragmentation of habitat will lead to the loss of migration corridors, in turn resulting in degeneration of the affected population's genetic make-up. This results in a subsequent loss of genetic variability between meta-populations occurring within the site. Pockets of fragmental natural habitats hinder the growth and development of populations.

During the prospecting operation the abovementioned activities have potential for dust generation. It is anticipated that the extent of dust emissions would vary substantially from day to day depending on the level of activity and the specific operations. The mine will add a certain amount of noise to the existing noise in the area. However, levels of noise generated by prospecting activities are low.

The impact of site generated trips on the traffic of the existing roads is experienced to be low. Nevertheless, if road safety is not administered it can have a high impact on the safety of fellow road users.

The prospecting operation, especially during construction, will create a number of new employment opportunities. The magnitude of this impact will depend on the number of people that will be employed and the number of contractors sourced. An influx of people into the area will possibly impact on safety and security of local residents. During the decommissioning and at closure of the mine, staff will most likely be retrenched. This can potentially flood the job market, resulting in people being unable to find new employment for a long period of time. It is normally more difficult for people with highly specialised skills to find employment immediately. Those with fewer skills have more flexibility in the job market.

Economic slump of the local towns after mine closure is an associated potential impact, although small due to the small scale of the operation. Income streams from wage bills as well as goods and services contracts (at all geographical levels) will come to an end, reducing the monetary income of individuals and mine-related businesses. People who have derived income directly or indirectly from the project may be inclined to leave the region in search of employment or business opportunities. This could result in further decline of the economy of the region as well as the abandonment of infrastructure. The loss of the prospecting workforce income will also impact upon non-mine related industries within the local and regional areas, particularly the rental property market and

retail and service industries who would have received income during the life of mine from the salaried workforce.

It is likely, however that there will be residual positive economic impacts that are not fully reversed with the closure of the prospecting operation, and that the economy will not decline to its original level prior to the development of this project. This is because the prospecting operation will generate substantial income for the regional and local economy, both directly and indirectly, during its life.

It is difficult to predict the actual impact of the prospecting closure in advance, but it is acceptable to assume that the prospecting closure will have a negative impact on the local and regional economy with a high probability of occurrence, a medium severity due to small scale and a medium significance.

Positive impacts include employment and training opportunities for people in the local community and local contractors; social upliftment and community development programmes; economic benefits.

viii) The possible mitigation measures that could be applied and the level of risk

(With regard to the issues and concerns raised by affected parties provide a list of the issues raised and an assessment/discussion of the mitigations or site layout alternatives available to accommodate or address their concerns, together with an assessment of the impacts or risks associated with the mitigation or alternatives considered)

Geology and mineral resource

Level of risk: Very low

Mitigation measures

- Ensure that optimal use is made of the available mineral resource through proper planning.
- The prospecting should be well planned and all infrastructure positions should be selected with the main aim of avoiding sterilization of future resources.
- No dumping of materials prior to approval by mine manager.

Topography

Level of risk: Low

Mitigation measures

- prospecting continuously if possible, otherwise when they become available;
- Employ effective rehabilitation strategies to restore surface topography of and controlled dumping and plant site;
- Stabilise the mine residue deposits;
- All temporary infrastructures should be demolished during closure.

Soil erosion

Level of risk: Medium-High

Mitigation measures

- Re-establishment of plant cover on disturbed areas must take place as soon as possible, once activities in each area have ceased.
- Bare ground exposure should be minimised in terms of the surface area and duration.
- The operation must co-ordinate different activities in order to optimise the excavated pits and trenches and thereby prevent repeated and unnecessary excavations and disturbances to the vegetation and soil.
- Construction/excavations during the rainy season (November to March) should be monitored and controlled.
- Run-off from exposed ground should be controlled with flow retarding barriers.
- All stockpiles must be kept as small as possible, with gentle slopes (18 degrees) in order to avoid excessive erosional induced losses.
- Excavated and stockpiled soil material are to be stored on the higher lying areas of the footprint area and not in any natural storm water run-off channels or any other areas where it is likely to cause erosion, or where water would naturally accumulate.
- Regular audits carried out to identify areas where erosion is occurring (incl. linear activities such as roads and pipelines); followed by appropriate remedial actions.

Soil pollution

Level of risk: Low

Mitigation measures

- Refuelling must take place in well demarcated areas and over suitable drip trays to prevent soil pollution.
- Spill kits to clean up accidental spills from earthmoving machinery must be well-marked and available on site.
- Workers must undergo induction to ensure that they are prepared for rapid clean-up procedures.
- All facilities where dangerous materials are stored must be contained in a bund wall.
- Vehicles and machinery should be regularly serviced and maintained.

Land capability and land use

Level of risk: Low to Medium

Mitigation measures

- Employ appropriate rehabilitation strategies to restore land capability.
- Carefully plan the placement of infrastructure and employ rehabilitation strategies to restore land capability.

Ground water

Level of risk: Low

Mitigation measures

- Training and awareness
    - Make all employees aware of water conservation/water demand management, water pollution avoidance and minimization measures reporting procedure and registry of incidents.
    - Train all employees to reduce water consumption.
    - Make one (1) individual person at a management level responsible for the management of the overall mine water balance. Train departmental heads

in the managing of water balance, water pollution and water conservation within their sectors.
    - Train all employees in the implementation of standard operating procedures (SOP's) (e.g. hydrocarbon management, sewerage management, monitoring and record keeping).
- Minimise and manage the loss in water resource
- Allow for a safe working environment

Surface water

Level of risk: Low to Medium

Mitigation measures

- Sufficient care must be taken when handling hazardous materials to prevent pollution.
- If servicing and washing of the vehicles occur on site, there must be specific areas constructed for these activities, which must have concrete foundations, bunding as well as oil traps to contain any spillages.
- A walled concrete platform, dedicated store with adequate flooring or bermed area and ventilation must be used to accommodate chemicals such as fuels, oils, paints, herbicide and insecticides.
- Oil residue shall be treated with oil absorbent and this material removed to an approved waste site.
- Spill kits must be easily accessible and workers must undergo induction regarding the use thereof.
- At all times care should be taken not to contaminate surface water resources.
- Provide bins for staff at appropriate locations, particularly where food is consumed.
- The prospecting site should be cleaned daily and litter removed.
- Conduct ongoing staff awareness programmes in order to reinforce the need to avoid littering, which can contribute to surface water pollution.
- Only environmentally friendly materials must be used to minimize pollution of surface water runoff and/or underground water resources.
- Pipe leakages should be minimized.
- Proper clean and dirty water separation techniques must be used to ensure uncontaminated water returning to the environment.
- Non prospecting waste i.e. grease, lubricants, paints, flammable liquids, garbage, historical machinery and other combustible materials generated during activities should be placed and stored in a controlled manner in a proper designed area.
- The topography of rehabilitation disturbed areas must be rehabilitated in such a manner that the rehabilitated area blends in naturally with the surrounding natural area. This will reduce soil erosion and improve natural re-vegetation.

Indigenous flora

Level of risk: Low to medium

Mitigation measures

- Implement best practise principles to minimise the footprint of transformation.

- Encourage proper rehabilitation of excavated areas, by effective backfilling and returning the stockpiled topsoil.
- Encourage the growth of natural plant species by sowing indigenous seeds or by
- planting seedlings. Seeds can be acquired from renukaroo@gmail.com.
- Ensure measures for the adherence to the speed limit to minimise dust plumes.
- Apply for permits to authorise the large-scale clearance of indigenous vegetation from DENC at least three months before such activities will commence.
- The footprint areas of the prospecting activities must be scanned for Red Listed and protected plant species prior to excavations.
- It is recommended that these plants are identified and marked prior to intended activity.
- These plants should ideally be incorporated into the design layout and left in situ.
- However, if threatened by destruction, these plants should be removed (with the relevant permits from DAFF and/or DENC) and relocated if possible.
- A management plan should be implemented to ensure proper establishment of ex situ individuals, and should include a monitoring programme for at least two years after re-establishment in order to ensure successful translocation.
- The designation of a full-time ECO is vital to render guidance to the staff and contractors with respect to suitable areas for all related disturbance, and must ensure that all contractors and workers undergo Environmental Induction prior to commencing with work on site. The environmental induction should occur in the appropriate languages for the workers who may require translation.
- All those working on site must be educated about the conservation importance of the flora occurring on site.
- Minimise the footprint of transformation.
- Encourage proper rehabilitation of excavated areas.
- Encourage the growth of natural plant species.
- Mechanical methods of control to be implemented extensively.
- Annual follow-up operations to be implemented.
- Minimise the footprint of transformation.
- Encourage proper rehabilitation of disturbed areas.
- Encourage the growth of a diverse selection of natural plant species.
- Mechanical methods of control to be implemented selectively.

Alien invasive plants

Level of risk: Low to Medium

Mitigation measures

- Minimise the footprint of transformation.
- Encourage proper rehabilitation of excavated areas.
- Encourage the growth of natural plant species.
- Mechanical methods of control to be implemented extensively.
- Annual follow-up operations to be implemented.

Fauna

Level of risk: Low – Medium

Mitigation measures

- All activities associated with the prospecting operation must be planned, where possible in order to encourage faunal dispersal and should minimise dissection or fragmentation of any important faunal habitat type.
- The extent of the earmarked area should be demarcated on site layout plans. No staff, contractors or vehicles may leave the demarcated area except those authorised to do so.
- Those pristine areas surrounding the earmarked area that are not part of the demarcated area should be considered as a no-go zone for employees, machinery or even visitors.
- Employ sound rehabilitation measures to restore the characteristics of any affected habitats. Careful consideration is required when planning the placement for stockpiling topsoil and the creation of access routes in order to avoid the destruction of habitats and minimise the overall prospecting footprint.
- The extent of the proposed prospecting should be demarcated on site layout plans.
- The appointment of a full-time ECO must render guidance to the staff and contractors with respect to suitable areas for all related disturbance, and must ensure that all contractors and workers undergo Environmental Induction prior to commencing with work on site.
- All those working on site must undergo environmental induction with regards to fauna and in particular awareness about not harming or collecting species such as snakes, tortoises and owls which are often persecuted out of superstition.
- All those working on site must be educated about the conservation importance of the fauna and flora occurring on site.
- The environmental induction should occur in the appropriate languages for the workers who may require translation.
- Reptiles and amphibians that are exposed during the clearing operations should be captured for later release or translocation by a qualified expert.
- Employ measures that ensure adherence to the speed limit.

Habitat

Level of risk: High

Mitigation measures

- Prospecting activities must be planned, where possible in order to encourage faunal dispersal and should minimise dissection or fragmentation of any important faunal habitat type.
- The extent of the prospecting area should be demarcated on site layout plans (preferably on disturbed areas or those identified with low conservation importance). No personnel or vehicles may leave the demarcated areas except those authorised to do so.

Air quality

Level of risk: Low-Medium

Mitigation measures

- Vegetation must be removed when soil stripping is required only. These areas should be limited to include those areas required for prospecting only, hereby reducing the surface area exposed to wind erosion. Adequate demarcation of these areas should be undertaken.
- Control options pertaining to topsoil removal, loading and dumping are generally limited to wet suppression.
- Where it is logistically possible, control methods for gravel roads should be utilised to reduce the re-suspension of particulates. Feasible methods include wet suppression, avoidance of unnecessary traffic, speed control and avoidance of track-on of material onto paved and treated roads.
- The length of time where open areas are exposed should be restricted. Prospecting should not be delayed after vegetation has been cleared and topsoil removed.
- Dust suppression methods should, where logistically possible, must be implemented at all areas that may / are exposed for long periods of time.
- For all prospecting activities management should undertake to implement health measures in terms of personal dust exposure, for all its employees:
    - Speed limits;
    - Spraying of surfaces with water;
    - Prospecting and rehabilitation of disturbed areas; and

Noise and vibration

Level of risk: Low to Medium

Mitigation measures

- Machinery with low noise levels which complies with the manufacturer's specifications to be used.
- Noise monitoring on a quarterly basis.
- Vehicles to comply with manufacturers' specifications and any activity which will exceed 90.0dBA to be done during daytime only.
- Haul roads to be levelled on a regular basis to avoid the formation of potholes.

Visual impacts

Level of risk: Low to Medium

Mitigation measures

Mitigation measures may be considered in two categories:

Primary measures that intrinsically comprise part of the development design through an iterative process. Mitigation measures are more effective if they are implemented from project inception when alternatives are being considered; and

Secondary measures designed to specifically address the remaining negative effects of the final development proposals:

- Primary measures that will be implemented should mainly be measures that minimise the visual impact by softening the visibility of the prospecting activities, by "blending" with the surrounding areas. Such measures will include rehabilitation of the disturbed area, such as the prospecting areas by re-vegetation of the area and using an aesthetically pleasing design for the proposed development.
- During the prospecting phases the following mitigation measures should be implemented to minimise the visual impact.
- Ensure that the design fits into the surrounding environment and it is aesthetically pleasing.
- Restrict the activities and movement of workers and vehicles to the immediate site and existing access roads.
- Ensure that rubble, litter and disused materials are managed and removed regularly.
- Ensure that all infrastructure and the site and general surrounds are maintained in a neat and appealing way.
- Reduce and control dust emitting activities through the use of approved dust suppression techniques; and
- Restrict activities to daylight hours in order to negate or reduce the visual impacts associated with lighting or restrict lighting to certain areas.
- During operational phase, the following mitigation measures should be implemented to minimise the visual impact.
- Ensure that the design fits into the surrounding environment and it is aesthetically pleasing.
- Ensure that all infrastructure and the site and general surroundings are maintained in a neat and appealing way;
- Rehabilitation of disturbed areas and re-establishment of vegetation;

Traffic and road safety

Level of risk: Low

Mitigation measures

- Implement measures that ensure the adherence to traffic rules.

Heritage resources

Level of risk: Medium

Mitigation measures

- The heritage and cultural resources (e.g. ruins, graves, historic structures, etc.) must be protected and preserved by the delineation of a no go zone.
- Should any further heritage or cultural resources be disturbed, exposed or uncovered during site preparations, these should immediately be reported to an accredited archaeologist.

Chance Find Protocol

1. Monitoring Programme for Palaeontology – to commence once the excavations / drilling activities begin.

2. The following procedure is only required if fossils are seen on the surface and when drilling/excavations commence.
3. When excavations begin the rocks and must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (plants, insects, bone, coal) should be put aside in a suitably protected place. This way the project activities will not be interrupted.
4. Photographs of similar fossil plants must be provided to the developer to assist in recognizing the fossil plants in the shales and mudstones. This information will be built into the EMP's training and awareness plan and procedures.
5. Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment.
6. If there is any possible fossil material found by the developer/environmental officer/miners then the qualified palaeontologist sub-contracted for this project, should visit the site to inspect the selected material and check the dumps where feasible.
7. Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site a SAHRA permit must be obtained. Annual reports must be submitted to SAHRA as required by the relevant permits.
8. If no good fossil material is recovered then no site inspections by the palaeontologist will not be necessary. A final report by the palaeontologist must be sent to SAHRA once the project has been completed and only if there are fossils.
9. If no fossils are found and the excavations have finished then no further monitoring is required.

Socio-economic

Level of risk: Low-Medium

Mitigation measures

In order to ensure that negative impacts are minimised and positives are enhanced, the following is recommended:

- Implement the mitigation measures as proposed in this report.
- As job creation is one of the most pressing socio-economic needs in the local community, through the development of the Bokamoso operation should focus on SMME development and related local job creation, whilst considering the limitations of the available local skills.
- The Bokamoso operation should assist their employees to find suitable housing in the towns surrounding the prospecting area to limit additional impacts on the provision of services and infrastructure by the SPM.
- Assistance in terms of skills development for those that would be employed during the project, as well as for permanent employees during the operational phase of the project would be necessary. Education is critical to sustain the socio-economic development of the community members living in the area. Continued support for training and capacity building thus remain important.

- Possible SMME links to the mine should be pursued to maximise local business benefits;

Interested and affected parties

Level of risk: Low

Mitigation measures

- Maintain active communication with IAPs.
- Ensure transparent communication with IAPs at all times.
- IAPs must be kept up to date on any changes in the prospecting operation.
- A complaints management system should be maintained by the mine to ensure that all issues raised by community members are followed up and addressed appropriately.

ix) Motivation where no alternative sites were considered

No alternative location for the proposed prospecting operation was considered, as the proposed alluvial diamond deposits occur in this area. There is therefore no other alternative with regard to the overall operation footprint.

x) Statement motivating the alternative development location within the overall site (Provide a statement motivating the final site layout that is proposed)

Not applicable. There is no alternative development location for the site as this is the area with the mineable resource.

h) Full description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site (In respect of the final site layout plan) through the life of the activity (Including (i) a description of all environmental issues and risks that are identified during the environmental impact assessment process and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures)

Not applicable. There is no alternative development location for the site and therefore the initial site locality is considered to be the final site locality. The impact assessment provided in section g(v) is therefore sufficient and the process undertaken to identify impacts is the same as in section g(vi).

i) Assessment of each identified potentially significant impact and risk

(This section of the report must consider all the known typical impacts of each of the activities (including those that could or should have been identified by knowledgeable persons) and not only those that were raised by registered interested and affected parties)

ACTIVITY Whether listed or not listed.	**POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater, contamination, air pollution)….**	**ASPECTS AFFECTED**	**PHASE In which impact is anticipated (e.g. construction, commissioning, operational, Decommissioning, closure, post closure)**	**SIGNIFICANCE IF NOT MITIGATED**	**MITIGATION TYPE (modify, remedy, control or stop) through (e.g. noise control measures, storm water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity**	**SIGNIFICANCE IF MITIGATION**
Processing Plant: 2 X 16 feet pans	Dust Noise Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance	Air Quality Fauna Flora Noise Soil Surface water Safety	Construction Commissioning Operational Decommissioning Closure	Medium	Access control Maintenance of processing plant Dust control and monitoring Noise and vibration control and monitoring Drip trays Storm water run-off control Immediately clean hydrocarbon spills Rip disturbed areas to allow re-growth of vegetation cover Noise control Well maintained equipment Selecting equipment with lower sound power levels; Taking advantage during the design stage of natural topography as a noise buffer; Develop a mechanism to record and respond to complaints.	Medium
Ablution Facilities	Soil contamination	Soil Groundwater Odours	Construction Commissioning Operational	Low	Maintenance of sewage facilities on a regular basis. Removal of chemical toilets on closure	Very Low

Chemical Toilets	Possible Groundwater contamination		Decommissioning Closure			
Clean & Dirty water systems:	Surface disturbance Soil contamination Surface water contamination	Soil Surface Water	Construction Commissioning Operational Decommissioning Closure	Low	It will be necessary to divert storm water around dumps areas by a berm that will prevent surface run-off into the drainage areas. The re-vegetation of disturbed areas is important to prevent erosion and improve the rate of infiltration. Erosion channels that may develop before vegetation has established should be rehabilitated by filling, levelling and re-vegetation where topsoil is washed away. Maintenance of trenches Monitoring and maintenance of oil traps in relevant areas. Drip trays used. Immediately clean hydrocarbon spill. Linear infrastructure such as roads and pipes will be inspected at least monthly to check that the associated water management infrastructure is effective in controlling erosion. Maintain a buffer zone of 100 m around the streams. Note that these buffer zones are essential to ensure healthy functioning and maintenance of wetland.	Low

Fuel Storage facilities (Diesel tanks)	Groundwater contamination Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance	Soil Groundwater Surface water	Construction Commissioning Operational Decommissioning Closure	Medium	Maintenance of Diesel tanks and bund walls. Oil traps Drip tray at re-fuelling point. Refuelling must take place in well demarcated areas and over suitable drip trays to prevent soil pollution. Spill kits to clean up accidental spills from earthmoving machinery must be well-marked and available on site. Workers must undergo induction to ensure that they are prepared for rapid clean-up procedures. All facilities where dangerous materials are stored must be contained in a bund wall. Vehicles and machinery should be regularly serviced and maintained.	Low
Prospecting Area.	Dust Noise Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance Surface water contamination	Air quality Fauna Flora Groundwater Noise and vibration Soil Surface Water Topography Safety	Commissioning Operational Decommissioning Closure	Medium	Access control Dust control and monitoring Noise and vibration control and monitoring Continuous rehabilitation Storm water run-off control Immediately clean hydrocarbon spill Drip trays MRD stability control and monitoring Erosion control Noise control Well maintained equipment Selecting equipment with lower sound power levels; Taking advantage during the design stage of natural topography as a noise buffer;	Low

					Develop a mechanism to record and respond to complaints. Maintain a buffer zone of 100 m around the streams. Note that these buffer zones are essential to ensure healthy functioning and maintenance of wetland. The extent of the prospecting area should be demarcated on site layout plans (preferably on disturbed areas or those identified with low conservation importance). Appointment of a full-time ECO must render guidance to the staff and contractors with respect to suitable areas for all related disturbance, and must ensure that all contractors and workers undergo Environmental Induction prior to commencing with work on site. All those working on site must undergo environmental induction with regards to fauna and in particular awareness about not harming or collecting species such as snakes, tortoises and owls which are often persecuted out of superstition. All those working on site must be educated about the conservation importance of the fauna and flora occurring on site. The environmental induction should occur in the appropriate languages for the workers who may require translation.	

					Reptiles and amphibians that are exposed during the clearing operations should be captured for later release or translocation by a qualified expert. Employ measures that ensure adherence to the speed limit. Careful consideration is required when planning the placement for stockpiling topsoil and the creation of access routes in order to minimise the overall prospecting footprint. The Footprint areas of the prospecting activities must be scanned for Red Listed and protected plant species prior to prospecting; Snares & traps removed and destroyed;	
Salvage yard (Storage and laydown area)	Possible Groundwater contamination Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance Surface water contamination	Fauna Flora Groundwater Soil Surface Water	Construction Commissioning Operational Decommissioning Closure	Medium	Access Control Maintenance of fence Storm water run-off control Immediately clean hydrocarbon spill	Low
Stockpile area	Dust Possible Groundwater contamination	Air Quality Fauna Flora Noise Soil Surface Water	Commissioning Operational Decommissioning Closure	Medium	Dust Control and monitoring Noise control and monitoring Drip trays Storm water run-off control Immediately clean hydrocarbon spills	Low

	Surface water contamination Noise Removal and disturbance of vegetation cover and natural habitat of fauna Surface disturbance				Rip disturbed areas to allow re-growth of vegetation cover Noise control Well maintained equipment Selecting equipment with lower sound power levels; Taking advantage during the design stage of natural topography as a noise buffer; Develop a mechanism to record and respond to complaints.	
Waste disposal site (domestic and industrial waste):	Groundwater contamination Contamination of soil Surface water contamination	Groundwater Soil Surface water	Construction Commissioning Operational Decommissioning Closure	Medium	Storage of Waste within receptacles Storage of hazardous waste on concrete floor with bund wall Removal of waste on regular intervals	Low
Roads (both access and haulage road on the prospecting site):	Dust Groundwater contamination Noise Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance	Air quality Fauna Flora Groundwater Noise and vibration Soil Surface water	Construction Commissioning Operational Decommissioning Closure	Medium	Maintenance of roads Dust control and monitoring Noise control and monitoring Speed limits Storm water run-off control Erosion control Immediately clean hydrocarbon spills Rip disturbed areas to allow re-growth of vegetation cover Noise control Well maintained equipment Selecting equipment with lower sound power levels; Taking advantage during the design stage of natural topography as a noise buffer; Develop a mechanism to record and respond to complaints.	Low

					Linear infrastructure such as roads and pipelines will be inspected at least monthly to check that the associated water management infrastructure is effective in controlling erosion.	
Temporary Workshop Facilities and Wash bays	Groundwater contamination Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination	Groundwater Soil Surface water	Construction Commissioning Operational Decommissioning Closure	Medium	Concrete floor with oil/water separator Storm water run-off control Immediately clean hydrocarbon spills	Low
Water distribution Pipelines	Surface disturbance	Fauna Flora Surface Water	Construction Commissioning Operational Decommissioning Closure	Medium	Monitor pipeline for water leaks Maintenance of pipeline Linear infrastructure such as roads and pipelines will be inspected at least monthly to check that the associated water management infrastructure is effective in controlling erosion.	Low
Water tanks: 1 X 10 000 litre water tanks and purifiers for potable water for each site.	Surface disturbance	Fauna Flora Surface Water	Construction Commissioning Operational Decommissioning Closure	Medium	Maintain water tanks and structures	Low

j) Summary of specialist reports

(This summary must be completed if any specialist reports informed the impact assessment and final site layout process and must be in the following tabular form):-

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED
ECOLOGICAL ASSESSMENT REPORT **Bokamoso Exploration (Pty) Ltd** **Elands Drift & Slangheuvel Diamond Prospecting Operation** **By Dr Betsie Milne** **July 2021** **APPENDIX 4**	Four plant communities occur on site of which the riparian woodland is of very high sensitivity. The remaining areas are of medium sensitivity. The most profound impacts expected to be related to the proposed prospecting operation include cumulative loss of intact habitat and biodiversity as well as potential loss in soil fertility. Additional secondary impacts could potentially include the disruption of the hydrological regime if the river channel or any of the drainage lines are modified through road creation or prospecting activities. Species of conservation concern that are associated with the earmarked area include Salsola tuberculata, Gymnosporia buxifolia, Aloe grandidentata and Gomphocarpus fruticosus. Permit applications regarding protected flora need to be lodged with the Northern Cape Department of Environment and Nature Conservation three months prior to any removal of these plants. No nationally protected trees occur on site. Disturbances to the natural habitat and associated fauna within the study area is inevitable. The significance of the impacts will ultimately be affected by the success of the mitigation measures implemented during the prospecting operation. In my opinion, authorisation for the proposed operation can be granted. However, the applicant should still commit to the adherence of effective avoidance, management, mitigation and rehabilitation measures	X	Contained in the mitigation measures and EMPR
HERITAGE IMPACT ASSESSMENT AND PALAEONTOLOGICAL DESKTOP ASSESSMENT FOR A MINE PROSPECTING RIGHT ON PORTION 6 (EMIL – A PORTION OF PORTION 3 (ONVERWAG)) OF THE FARM	EXECUTIVE SUMMARY A Heritage Impact Assessment (HIA) study has been conducted on behalf of Bokamoso Exploration (Pty) Ltd to support a mine prospecting rights application on Portion 6 of the Farm Elandsdrift 159 and the Remaining Extent of Portion 1 of the Farm Slangheuvel 160, near Barkly West in the Dikgatlong Local Municipality, Northern Cape Province. A ground survey was conducted	X	Contained in the mitigation measures and EMPR

ELANDSDRIFT 159 AND REMAINING EXTENT OF PORTION 1 OF THE FARM SLANGHEUVEL 160, BARKLY-WEST, NORTHERN CAPE PROVINCE **Prepared by** **Dr. Edward Matenga** **20 June 2021** **APPENDIX 5**	on 9th and 10th June 2021 for the possible occurrence of archaeological and historical material on the property. The heritage sensitivity of the property is summarised as follows: 1. The Stone Age A few stone tools were found. The occurrence of a cleaver (BMK08) shows the Early Stone Age origins of the stone tool cultures which became well established in subsequent epochs of the Stone Age, i.e. the Middle and Late State Age. None of the finds warrants further action. 2. The Iron Age No material dating to the Iron Age was found. 3. Historic buildings There are a number of buildings of different typologies on the property. Together they constitute the built environment typical of many farms in the broader area. Increasingly this is being recognised as a cultural landscape of heritage significance. The circular fields under pivot irrigation add another key element to the landscape as they are a common occurrence on the silt banks of the Vaal and Orange Rivers. None of buildings will be affected by the prospecting and mining operations. 4. Burial grounds Two burial grounds were recorded (BMK04, BMK13). It is recommended that the burial grounds are fenced off and 100 m buffer reserved in accordance with SAHRA minimum standards. If operations will encroach into the buffer area, a permit must be obtained from SAHRA. Conclusion The mine prospecting application may be given a green light to go ahead with the recommendations heeded to avoid the burial grounds. As a standard procedure, in the event of other heritage resources being discovered in future phases of the project, the Provincial Heritage Resources Authority or SAHRA must be alerted immediately and an archaeologist or heritage expert called to attend.		
Desktop Study (Phase 1) Palaeontological Impact Assessment for the proposed prospecting rights application, on Portion 6	Executive Summary A Palaeontological Impact Assessment was requested for the Bokamoso Prospecting Rights application on portions of two farms in the Barkly West area (Onverwag 159 and Slangheuvel 160) for diamonds.	X	Contained in the mitigation measures and EMPR

(emil – a Portion of portion 3 (Onverwag)) of the Farm Elandsdrift 159 and Remaining Extent of Portion 1 of the Farm Slangheuvel 160, near Barkly-West, Northern Cape Province **17 June 2021** **Prepared by:** **Prof Marion Bamford** **APPENDIX 6**	To comply with the regulations of the South African Heritage Resources Agency (SAHRA) in terms of Section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA), a desktop Palaeontological Impact Assessment (PIA) was completed for the proposed project. The prospecting site lies on the highly sensitive shales of the Prince Albert Formation (Ecca Group, Karoo Supergroup) that might preserve marine fossils or fragmentary early Glossopteris flora fossil plants, of early Permian age. There are also areas of moderate sensitivity in the project area that have Quaternary sands but there is a very small chance that fossils occur here as they would have been transported. Nonetheless, a Fossil Chance Find Protocol should be added to the EMPr. Based on this information it is recommended that no palaeontological site visit is required unless fossils are discovered by the responsible person, then a palaeontologist should be called to rescue a representative sample. **Recommendation** Based on experience and the lack of any previously recorded fossils from the area, it is unlikely that any fossils would be preserved in the sands and alluvium of the Quaternary. There is a small chance that fossils may occur in the shales of the early Permian Prince Albert Formation (Ecca Group, Karoo Supergroup) so a Fossil Chance Find Protocol should be added to the EMPr. If fossils are found once excavating and prospecting have commenced then they should be rescued and a palaeontologist called to assess and collect a representative sample.		

Attach copies of the Specialist Reports as appendices (All studies attached as Appendices from 4 - 6)

k) Environmental impact statement

(i) Summary of the key findings of the environmental impact assessment;

- The Processing plant may have a medium impact on air quality, fauna, flora, noise, soil and surface water after mitigation.
- The Ablution facilities will have a very low impact on groundwater and soil in case of an emergency spill after mitigation.
- The Clean & Dirty water systems may have a low impact on groundwater, soil and surface water after mitigation.
- The Fuel Storage facilities (Diesel tanks) may have a low impact on groundwater, soil, and surface water after mitigation.
- The Prospecting Area may have a low impact on air quality fauna, flora, noise, soil, surface water and topography after mitigation.
- The Salvage yard (Storage and laydown area) may have a low impact on fauna, flora, groundwater, soil and surface water after mitigation.
- The Stockpile area may have a low impact on air quality, fauna, flora, noise, soil and surface water after mitigation.
- The waste disposal sites (domestic and industrial waste) may have a low impact on groundwater, soil, and surface water after mitigation.
- The Roads (both access and haulage road on the prospecting site) may have a low impact on air quality, fauna, flora, noise, soil and surface water after mitigation.
- The Workshops and Wash bays may have a low impact on groundwater, soil and surface water after mitigation.
- The Water distribution Pipelines may have a low impact on fauna, flora, and surface water after mitigation.
- The Water tanks may have a low impact on fauna, flora, and surface water after mitigation.

From the assessment of impacts throughout all the phases it is clear that though the impacts may occur directly as a result of the proposed start in prospecting operations, the impacts are mostly of medium significance before mitigation. According to the assessment carried out by the EAP the majority of the impacts can be reduced to a low significance with the appropriate mitigation measures in place.

The EAPs and environmental consultants responsible for the compilation of this document, and the associated PPP are of the opinion based on the presented specialist assessments and impact assessment that the Environmental Authorization application should be authorised.

The following mitigation measures are crucial and should form part of the environmental authorisation to ensure that the applicant manages impacts adequately:

- Adhere to the approved Environmental Management Programme

- Adhere to the Emergency procedures Report and implement spill clean-up procedures
- Apply for relevant permits with authorities for the removal of indigenous tree species and indigenous vegetation if applicable.
- Major spills should be reported within 24hr to the Department of Water and Sanitation and the NCDENC.

The nature of impacts can vary widely depending on the type of physical environment, the size of the activity and the perceptions and values of each of the affected parties. It was the objective of the assessment to identify both positive and negative impacts. The existing information was reviewed to assess the present status of the environment and the extent to which they have already been modified. The planned activities and associated infrastructure were used as reference to assess potential impacts.

In general, the environmental impacts associated to the prospecting operation are rather negative, while the social impacts are more beneficial. Impacts on vegetation are likely to be most profound, because the prospecting operation will constitute clearance of indigenous vegetation and most likely also the removal of protected species if any is encountered. Soil erosion and surface water deterioration are likely to be possible important impacts if appropriate management strategies are not practised.

Positive impacts include the demarcation and subsequent protection of heritage resources and the eradication of alien invasive species. Positive social impacts include the creation of jobs, social upliftment, training opportunities, community development and numerous economic benefits.

To conclude, it must be accepted that any activities will have both physical and social impacts. Therefore the destruction of the natural environmental features within the prospecting area is inevitable. The significance of the impacts will however be affected by the success of the mitigation measures implemented and the rehabilitation programme for the prospecting area.

(ii) Final Site Map;

Provide a map at an appropriate scale which superimposes the proposed overall activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicated any areas that should be avoided, including buffers. Attach as **Appendix (Figure 26)**

The sensitivity map for the Bokamoso prospecting operation is illustrated in Figure 25. All watercourses in the study area are also unique habitats protected in terms of the National Water Act (Act No 36 of 1998). These units are essentially **no-go areas**.

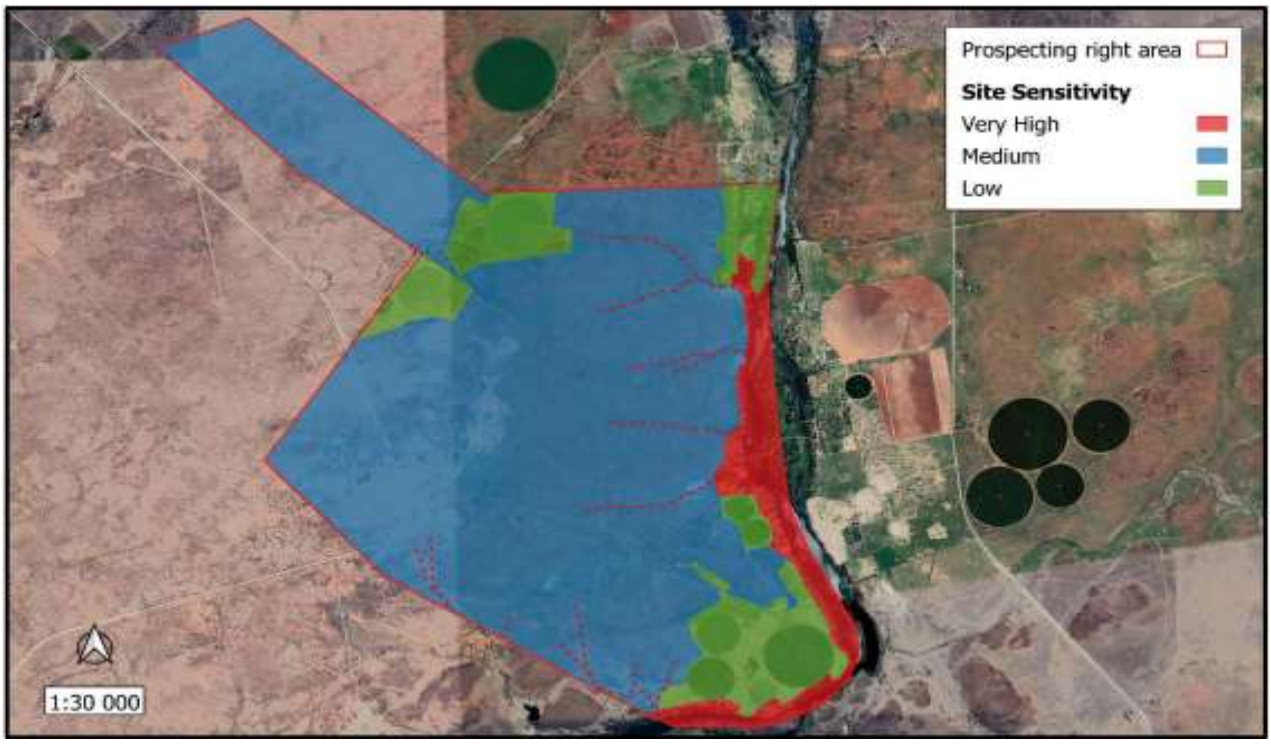


Figure 25. A sensitivity map for the Bokamoso prospecting area

Two burial grounds were recorded (BMK04, BMK13). It is recommended that the burial grounds are fenced off and 100 m buffer reserved in accordance with SAHRA minimum standards. If operations will encroach into the buffer area, a permit must be obtained from SAHRA.

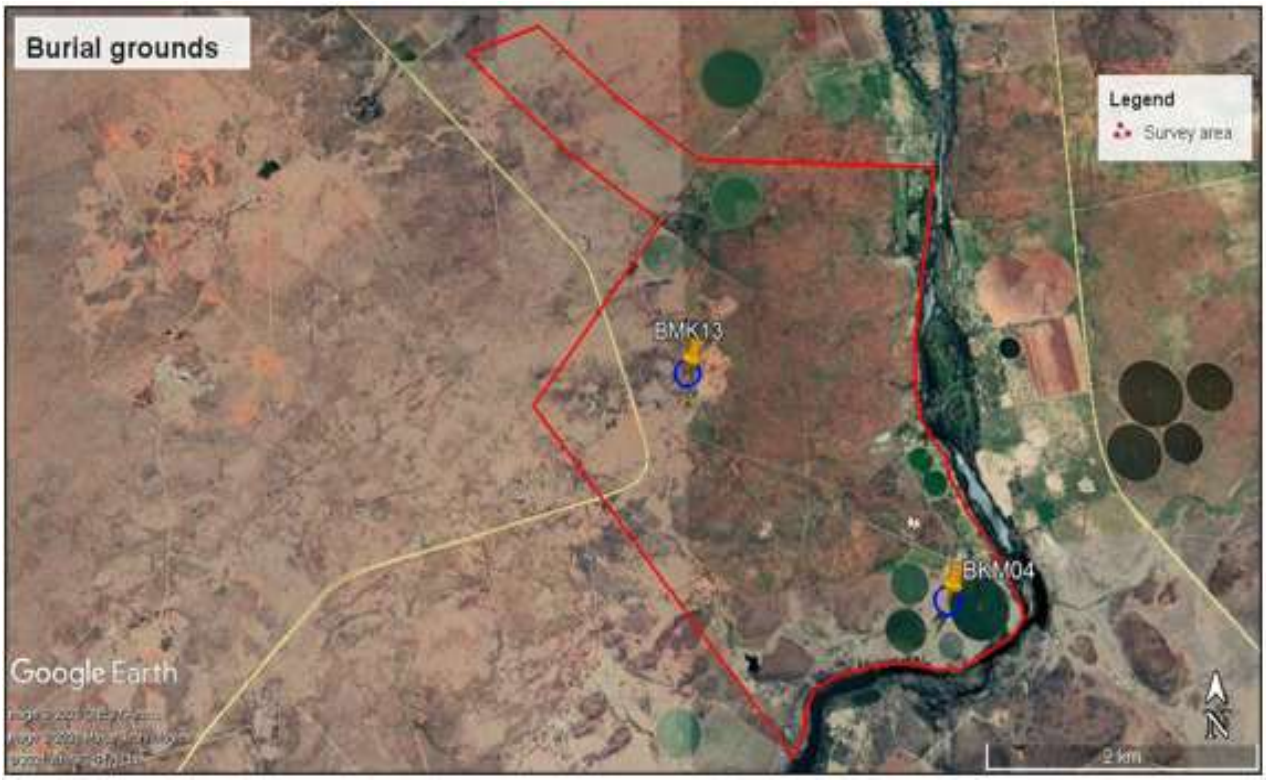


Figure 26. Location of the burial grounds

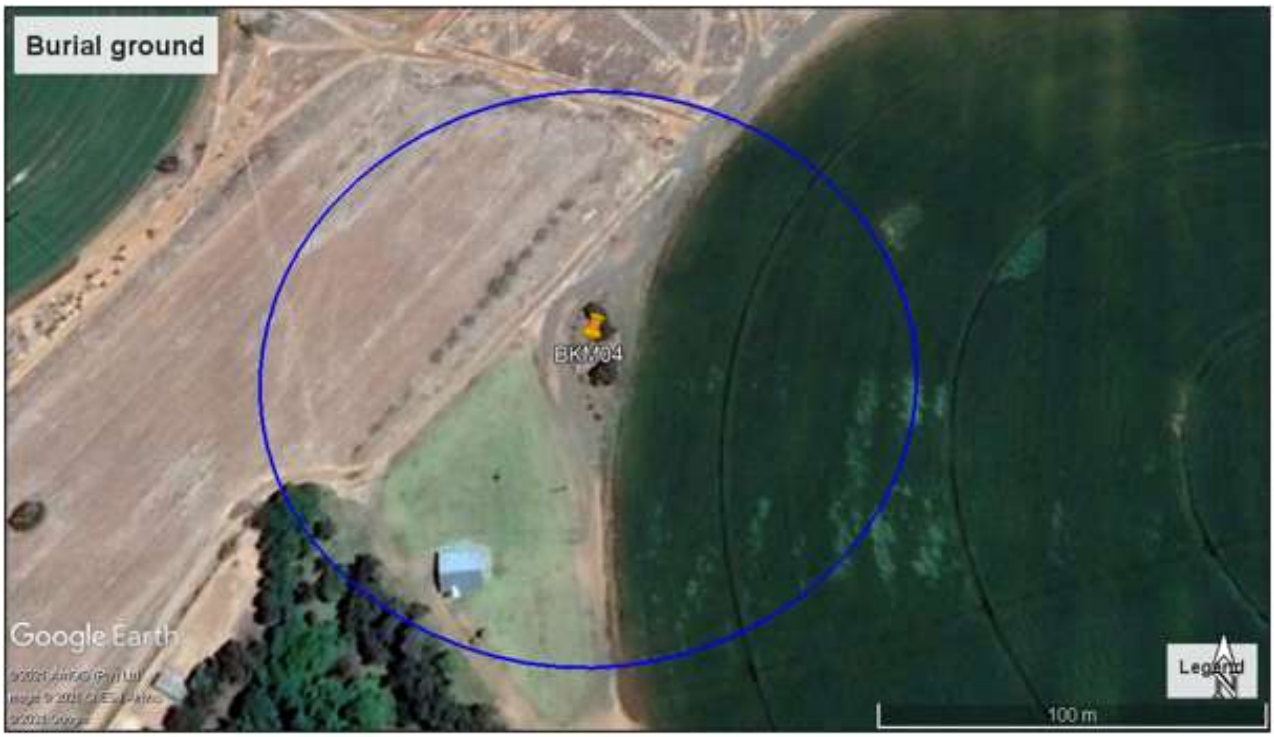


Figure 27. Burial ground (BMK04) and the proposed buffer area

Figure 28. Burial ground (BMK13) and the proposed buffer area

This Prospecting application affects the existing Eskom Distribution's power lines, Riverton/North River Farmers1 11kV Overhead Line and Riverton/Slypklip 1 66kV Overhead Line which traverses the proposed prospecting right area. The approximate positions of these services are indicated on the attached locality Map (Figure .).

No construction or excavation work shall be executed within 11 metres from any Eskom power line structure, and/or within 11 metres from any stay wire.

The clearances between Eskom's live electrical equipment and the proposed construction work shall be observed as stipulated by Regulation 15 of the Electrical Machinery Regulations of the Occupational Health and Safety Act, 1993 (Act 85 of 1993).

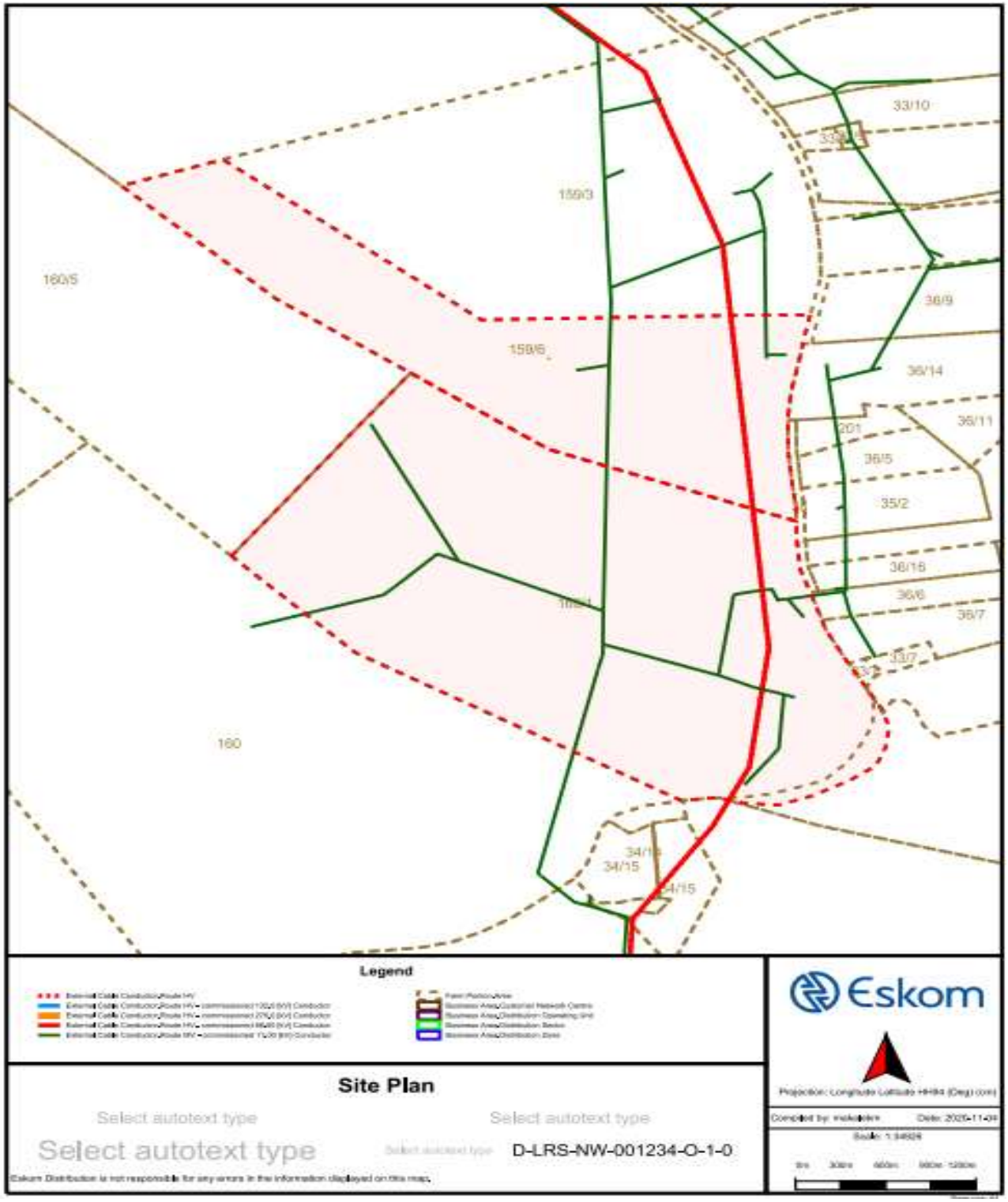


Figure 29. Eskom powerlines that are present on the application area.

The only other buffers that must be implemented is the 100m away from any fixed infrastructure like the roads that runs on the farm in terms of the Mine Health and Safety Act, 1996 (Act no 29 of 1996) Regulations relating to surveying, mapping and mine plans. These regulations states that a prospecting operation must take reasonable measures to ensure that-

No prospecting operations are carried out within a horizontal distance of 100 (one hundred) metres from reserve land, buildings, roads, railways, dams or any other structure whatsoever including such structures beyond the prospecting boundaries, or any surface, which it may be necessary to protect in order to prevent any significant risk, unless a lesser distance has been determined safe by risk assessment and all restrictions and conditions determined in terms of the risk assessment are complied with;

Please see Final Site Map below.

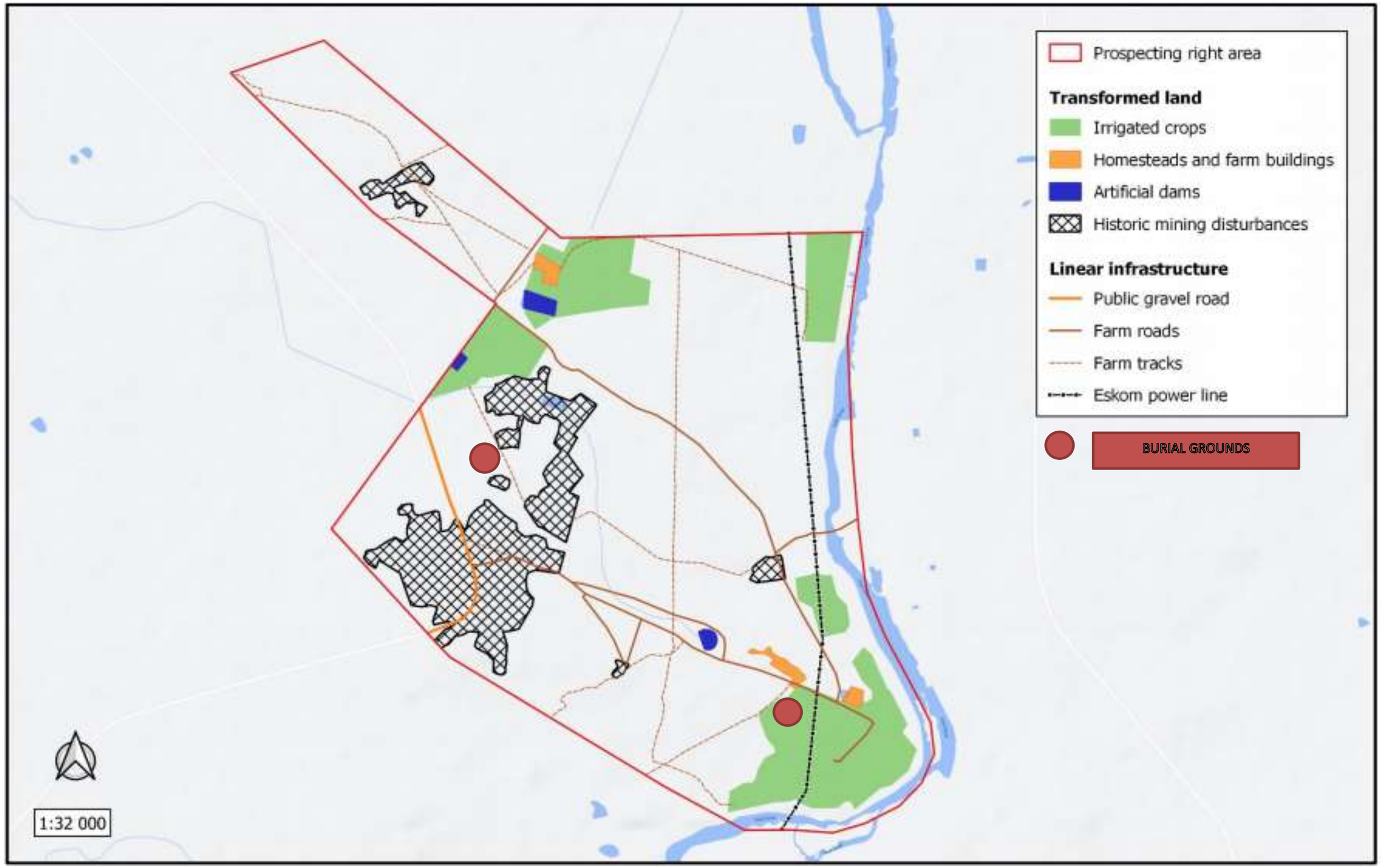


Figure 30. Existing infrastructure map (Dr. B Milne, Ecological report).

(iii) Summary of the positive and negative implications and risks of the proposed activity and identified alternatives;

During construction and operation of the prospecting, there is a possibility of sterilisation of the mineral reserves and resources due to improper placement of infrastructure. The infrastructure and slimes dam will alter the topography by adding features to the landscape. Topsoil removal and prospecting will unearth the natural topography. The construction of infrastructure and various facilities in the prospecting area can also result in loss of soil due to erosion. Vegetation where present will be stripped in preparation for placement of temporary prospecting infrastructure, and therefore the areas will be bare and susceptible to erosion. The topsoil that is stripped and piled on surrounding areas can be eroded by wind and rain. The soil will be carried away during runoff. The declared areas will be rehabilitated, but full restoration of soil might only occur over some time, subsequent to the re-establishment of vegetation. Furthermore, improper stockpiling and soil compaction can result in soil sterilisation. Leaching can also occur, resulting in the loss of nutrients.

During the construction and prospecting operation, there is a possibility that equipment might leak oil, thus causing surface spillages. The hydrocarbon soil contamination will render the soil unusable unless they are decontaminated. The storage of fuels on site might have an impact on soil if the tanks that are available on site are not properly monitored and maintained to avoid leakages. Then there is the potential that contaminated soil can be carried through runoff to contaminate water resources and soil stockpiled for rehabilitation. Soil pollution is therefore possible, but through mitigation it can be minimised.

The loss of land capability and land use can occur in two ways. Firstly, through topsoil removal, disturbances and loss of soil fertility; and secondly through the improper placement of infrastructure. The site has a land capability for grazing and limited agriculture, but grazing activities can still be performed in areas not earmarked for prospecting, and with proper rehabilitation the land capabilities and land use potential can be restored.

If oil and fuel spillages occur, then it will seep into the underlying aquifers and contaminate ground water. Improper handling of hazardous material will cause contamination of nearby surface water resources during runoff episodes. Lack of storm control structures will lead to erosion of stockpiles during heavy rains and runoff will carry suspended solids into the downstream environment. This might cause high silt load and affect stream flow.

Construction and prospecting activities on site will reduce the natural habitat for ecological systems to continue their operation. Vehicle traffic generates lots of dust which can reduce the growth success and seed dispersal of many small plant species. It is expected that protected species if present can be destroyed during the bulk sampling operation.

While general clearing of the area and prospecting activities destroy natural vegetation, invasive plants can increase due to their opportunistic nature in disturbed areas. If invasive plant establishes in disturbed areas, it may cause an impact beyond the boundaries of the prospecting site. These alien invasive species are thus a threat to surrounding natural vegetation and can result in the decrease of biodiversity and ecological value of the area. Therefore, if alien invasive species are not controlled and managed, their propagation into new areas could have a high impact on the surrounding natural vegetation in the long term. With proper mitigation, the impacts can be substantially reduced.

The transformation of natural habitats to prospecting and associated infrastructure will result in the loss of habitat affected individual species, and ecological processes. In turn this will result in the displacement of faunal species dependent upon such habitat. Increased noise and vibration due to prospecting activities will disturb and possibly displace birds and other wildlife. Fast moving vehicles take a heavy toll in the form of road kills of small mammals, birds, reptiles, amphibians and a large number of invertebrates. The construction of the temporary prospecting and associated infrastructure will result in the loss of connectivity and fragmentation of natural habitat. Fragmentation of habitat will lead to the loss of migration corridors, in turn resulting in degeneration of the affected population's genetic make-up. This results in a subsequent loss of genetic variability between meta-populations occurring within the site. Pockets of fragmental natural habitats hinder the growth and development of populations.

During the prospecting operation the abovementioned activities have potential for dust generation. It is anticipated that the extent of dust emissions would vary substantially from day to day depending on the level of activity and the specific operations. The mine will add a certain amount of noise to the existing noise in the area. However, levels of noise generated by prospecting activities are low.

The impact of site generated trips on the traffic of the existing roads is experienced to be low. Nevertheless, if road safety is not administered it can have a high impact on the safety of fellow road users.

The prospecting operation, especially during construction, will create a number of new employment opportunities. The magnitude of this impact will depend on the number of people that will be employed, and the number of contractors sourced. An influx of people into the area will possibly impact on safety and security of local residents. During the decommissioning and at closure of the mine, staff will most likely be retrenched. This can potentially flood the job market, resulting in people being unable to find new employment for a long period of time. It is normally more difficult for people with highly specialised skills to find employment immediately. Those with fewer skills have more flexibility in the job market.

Economic slump of the local towns after mine closure is an associated potential impact, although small due to the small scale of the operation. Income streams from wage bills

as well as goods and services contracts (at all geographical levels) will come to an end, reducing the monetary income of individuals and mine-related businesses. People who have derived income directly or indirectly from the project may be inclined to leave the region in search of employment or business opportunities. This could result in further decline of the economy of the region as well as the abandonment of infrastructure. The loss of the prospecting workforce income will also impact upon non-mine related industries within the local and regional areas, particularly the rental property market and retail and service industries who would have received income during the life of mine from the salaried workforce.

It is likely, however that there will be residual positive economic impacts that are not fully reversed with the closure of the prospecting operation, and that the economy will not decline to its original level prior to the development of this project. This is because the prospecting operation will generate substantial income for the regional and local economy, both directly and indirectly, during its life.

It is difficult to predict the actual impact of the prospecting closure in advance, but it is acceptable to assume that the prospecting closure will have a negative impact on the local and regional economy with a high probability of occurrence, a medium severity due to small scale and a medium significance.

Positive impacts include employment and training opportunities for people in the local community and local contractors; social upliftment and community development programmes; economic benefits.

In terms of the Social Impact Assessment findings derived from the information available at this stage it is concluded that the likely benefits of the proposed project outweigh the potential social risks and/or threats to the local communities. However, as indicated earlier in the report, the possible impact on the infrastructure and service needs due to the inflow of an additional workforce should be addressed. It would remain the responsibility of the Local Municipality, but considering the social framework within which the mine operates, it is important for the mine to engage with the SPM in this regard to minimise any possible negative impacts. Such engagement should also contribute to meaningful contributions to the communities situated in close proximity to the mine.

The prospecting activities and associated infrastructure by itself will thus not introduce new social risks and hazards, but only increase the probability and scale of those already associated with the existing prospecting activities

On a more detailed level, the following **positive** impacts are anticipated:

- The creation of job opportunities in the area, and associated local economic development;
- Economic and revenue contribution to the local municipal area, as well as the District and adjacent municipalities;

- The involvement of Bokamoso with regards to training and capacity building of its employees and subsequent improvement of the livelihoods of the employees' families, as well as its efforts in sustaining the socio-economic development of the communities in close proximity to the operation;
- The positive impact of prospecting activity on the regional and local economy; and
- Positive impact of extensive local procurement focus.

Negative impacts as a result of the prospecting activity refer to:

- Four plant communities occur on site of which the riparian woodland is of very high sensitivity. The remaining areas are of medium sensitivity. The most profound impacts expected to be related to the proposed prospecting operation include cumulative loss of intact habitat and biodiversity as well as potential loss in soil fertility. Additional secondary impacts could potentially include the disruption of the hydrological regime if the river channel or any of the drainage lines are modified through road creation or prospecting activities.
- Disturbances to the natural habitat and associated fauna within the study area is inevitable. The significance of the impacts will ultimately be affected by the success of the mitigation measures implemented during the prospecting operation.

- Inconvenience and intrusion impacts during the project such as the inflow of an additional workforce to the area, the possible influx of jobseekers, possible increase in the criminal activities (safety and security issues), disruption of social networks, as well as possible health risks;
- Disruptions in the daily living and movement patterns (increased traffic and possible dust pollution);
- Additional pressure on infrastructure development and maintenance;
- General intrusion impacts such as visual and noise pollution

From a social perspective it can be concluded that the proposed Bokamoso Project would not result in permanent damaging social impacts. The socio-economic benefits associated with the prospecting activity outweigh the negative social impacts. It is thus concluded that the proposed project is acceptable from a social point of view, provided that mitigation measures are implemented.

Negative impacts on the area are expected to be temporary and can be mitigated to a large extent if the recommendations of the EMPR are adhered to e.g. ongoing environmental management and rehabilitation once the mine reaches its end of life.

l) Proposed impact management objectives and the impact management outcomes for inclusion in the EMPr

Based on the assessment and where applicable the recommendations from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as conditions of authorisation.

Topography

- All prospecting areas must be rehabilitated if and when possible and made safe so as to reflect as far as possible the pre-prospecting topography of the area.
- All temporary features e.g. plant, containers and stockpiling must be removed and handled in the prescribed manner during rehabilitation.

Soil

- Topsoil needs to be removed and stored separately before any vegetation is stripped.
- These topsoil stockpiles must be kept as small as possible in order to prevent compaction and the formation of anaerobic conditions.
- Topsoil must be stockpiled for the shortest possible timeframes to ensure that the quality of the topsoil is not impaired.
- Topsoil must not be handled when the moisture content exceeds 12 %.
- Topsoil stockpiles must by no means be mixed with sub-soils.
- The topsoil should be replaced as soon as possible on to the disturbed areas, thereby allowing for the re-growth of the seed bank contained within the topsoil.
- Re-establishment of plant cover on disturbed areas must take place as soon as possible once
- activities in the area have ceased.
- Ground exposure should be minimised in terms of the surface area and duration.
- The operation must co-ordinate different activities to optimise the drilling and bulk sampling in such a way to prevent repeated and unnecessary disturbances to the vegetation and soil.
- No new roads should be construction over drainage lines for the prospecting operation. All activities should use existing roads, or create suitable bridges across the drainage lines.
- Disturbances during the rainy season (November to March) should be monitored and
- controlled.
- Any potential run-off from exposed ground should be controlled with flow retarding barriers.
- All stockpiles must be kept as small as possible, with gentle slopes (18 degrees) in order to avoid excessive erosional induced losses.
- Any excavated and stockpiled material are to be stored on the higher lying areas of the footprint area and not in any natural storm water run-off channels or any other areas where it is likely to cause erosion, or where water would naturally accumulate.
- Regular monitoring during the prospecting operation should be carried out to identify areas where erosion is occurring; followed by appropriate remedial actions.

Flora

- Implement best practise principles to minimise the footprint of transformation, by keeping to existing roads where possible.

- Encourage proper rehabilitation of bulk sampling areas, by effective backfilling and returning the stockpiled topsoil.
- Encourage the growth of natural plant species by sowing indigenous seeds or by planting seedlings where major vegetation clearances have taken place. Seeds and seedlings for this region can be acquired from renukaroo@gmail.com.
- Implement effective avoidance measures to limit any activities in the drainage lines, river channels and riparian woodland, by applying the no-go principles around these areas.
- Ensure measures for the adherence to the speed limit to minimise dust plumes.
- Apply for permits to authorise the clearance of indigenous plants from DENC at least three months before such activities will commence.
- All footprint areas of the prospecting activities must be scanned for Red Listed and protected plant species prior to any destructive activities.
- It is recommended that these plants are identified and marked prior to intended activity. These plants should ideally be incorporated into the design layout plan and left in situ. However, if threatened by destruction, these plants should be removed (with the relevant permits from DAFF and/or DENC) and relocated if possible.
- A management plan should be implemented to ensure proper establishment of ex situ individuals, and should include a monitoring programme for at least two years after re-establishment in order to ensure successful translocation.
- The designation of an environmental officer is recommended to render guidance to the staff and contractors with respect to suitable areas for all related disturbance, and must ensure that all contractors and workers undergo Environmental Induction prior to commencing with work on site. The environmental induction should occur in the appropriate languages for the workers who may require translation.
- All those working on site must be educated about the conservation importance of the flora
- occurring on site as well as the legislation relating to protected species.
- Employ measures to ensure that no illegal harvesting takes place.
- Minimise the footprint of transformation.
- Encourage proper rehabilitation of disturbed areas.
- Encourage the growth of natural plant species.
- Mechanical methods of control to be implemented if needed.
- Annual follow-up operations to be implemented.
- Minimise the footprint of transformation.
- Encourage proper rehabilitation of disturbed areas which encourages the growth of a diverse selection of natural plant species.
- Mechanical methods of control to be implemented selectively where needed.
- Annual follow-up monitoring to be implemented.

Fauna

- All activities associated with the prospecting operation must be planned, where possible to encourage faunal dispersal and should minimise dissection or fragmentation of any important faunal habitat type.
- The extent of the earmarked area should be demarcated on site layout plans. No staff, contractors or vehicles may leave the demarcated area except those authorised to do so.

- Those pristine areas surrounding the earmarked area that are not part of the demarcated area should be considered as a no-go zone for all people and machinery.
- Limit the removal of adult trees as far as possible.
- No prospecting activities should take place in the river, drainage lines or adjacent wetlands. If unavoidable, a water use license to alter the beds and banks of each earmarked watercourse should be obtained from DWS prior to such activities.
- After such a licence has been obtained, care should still be taken to minimise the footprint within each watercourse. Sound rehabilitation measures to restore the characteristics of any affected watercourses should also be applied.
- Careful planning of the operation is needed to avoid the destruction of pristine habitats and minimise the overall disturbance footprint.
- The extent of the prospecting activities should be demarcated on site layout plans, and no personnel or vehicles may leave the demarcated area except if authorised to do so. Areas surrounding the earmarked site that are not part of the demarcated area should be considered as a no-go zone.
- If any protected fauna species are threatened by habitat destruction, the relevant permits from DENC should be obtained followed by the relevant mitigation procedures stipulated in the permits.
- No prospecting should take place in the river, drainage lines or adjacent wetlands. If this is unavoidable, a water use license to alter the beds and banks of each earmarked watercourse should be obtained from DWS prior to such activities. After such a licence has been obtained, care should still be taken to minimise the footprint in each watercourse.
- Everyone on site must undergo environmental induction for awareness on not harming or collecting species that are often persecuted out of superstition and to be educated about the conservation importance of the fauna occurring on site.
- Reptiles and amphibians that are exposed during the clearing operations should be captured for later release or translocation by a qualified expert.
- Employ measures that ensure adherence to the speed limit on public roads as well as driving mindfully on farm tracks to lower the risk of animals being killed while traversing the property.

Surface water

- The disposal of oil, grease and related industrial waste must be transported to the stores area where it will be stored in steel containers supplied by an oil recycling contractor. All oil and grease must be removed on a regular basis from the operation by a registered approved contractor.
- All refuse and waste from the different sections must be handled according to NEMA Guidelines. Recycling of waste is encountered in all the consumer sections of the operation, where recyclable materials must be collected before dumping them in the domestic waste disposal area.
- All non-biodegradable (recyclable) refuse such as glass bottles, plastic bags and metal scrap must be stored in a container in the waste area and collected on a regular basis and disposed of at a recognized disposal facility.
- Erosion and storm water control measures must be implemented.

- An application for an integrated Water Use Licence must be submitted at the Department of Water and Sanitation for all actions to be performed which requires authorization in terms of water uses.
- Vehicle repairs must only take place within the maintenance area for vehicles. Repairs within open excavations must be limited to emergency break downs with drip trays.
- Re-fuelling must only take place in the re-fuelling area. If this is found not to be practical, drip trays must be used whenever re-fuelling takes place outside of this area.
- During rehabilitation the application must endeavour to reconstruct flow patterns in such a way that surface water flow is in accordance with the natural drainage of the area as far as practically possible.
- Buffer zones must be placed around all non-perennial drainage lines in which no prospecting may take place.
- Minimise the footprint of transformation.
- No new roads should be created across a watercourse.
- No prospecting activities should take place in the river, drainage lines or adjacent wetlands. If unavoidable, a water use license to alter the beds and banks of each earmarked watercourse should be obtained from DWS prior to such activities.
- After such a licence has been obtained, care should still be taken to minimise the footprint within each watercourse and to apply effective rehabilitation measures.

Groundwater

- Vehicle- and equipment maintenance must only be allowed within the maintenance area. Only emergency breakdowns may be allowed in other areas.
- The following procedure must be followed if a vehicle or piece of equipment would break down inside an excavation and outside of the maintenance area.
    - Drip pans must be placed at all points where diesel, oil or hydraulic fluid may drip and in so doing contaminate the soil.
    - All efforts must be made to move the broken-down vehicle or piece of equipment to the maintenance area.
    - If the vehicle/piece of equipment cannot be moved, the broken part must firstly be drained of all fluid. The part must then be removed and taken to the maintenance area.
- No repairs may be allowed outside the maintenance area except for emergencies.
- Equipment used as part of the proposed operation must be adequately maintained so as to ensure that the oil, diesel, grease or hydraulic fluid does not leak during the operation.
- Fuel and other petrochemicals must be stored in steel receptacles that comply with SANS 10089-1:2003 (SABS 089-1:2003) standards. An adequate bund wall, 150% of volume of the largest storage receptacle, must be provided for fuel and diesel areas to accommodate any spillage or overflow of these substances. The area inside the bund wall must be lined with an impervious lining to prevent infiltration of the fuel into the soil (and ultimately groundwater).
- Proper sanitation facilities must be provided for employees. No person may pollute the workings with faeces or urine, misuse the facilities provided or inappropriately foul the surrounding environment with faeces or urine.

- Acceptable hygienic and aesthetic practices must be adhered to.
- The workshops, washing bays and sewage tanks should be constructed far away from significant aquifer systems.
- SOP for storage, handling and transport of different hazardous materials.
- Place oil traps (drip trays) under stationary vehicles, only re-fuel al fuelling stations, construct structures to trap fuel spills at fuelling stations, immediately clean oil and fuel spills and dispose of contaminated material at licensed sites only.
  Ensure good housekeeping rules.

Air Quality

- To limit the creation of nuisance dust the following management guidelines must be followed:
- Avoidance of unnecessary removal of vegetation.
- Routine spraying of unpaved site areas and roads utilized by the prospecting operation with water.
- Speed limits of vehicles inside the prospecting area must be strictly controlled to avoid excessive dust or the excessive deterioration of the roads to be used.
- Continuous dumping and rehabilitation of disturbed areas.
- All cleared, disturbed or exposed areas must be re-vegetated as soon as practically possible to prevent the formation of additional sources of dust.

Noise

- Working hours must be kept between sunrise and sunset as far as possible.
- As a minimum, ambient noise levels emanating from the prospecting activities may not exceed 82dBA at the site boundary.
- The Company must comply with the Occupational Noise Regulations of the Occupational Health and Safety Act, Act 85 of 1993.
- The company must comply with the measures for good practice with regard to management of noise related impacts during the operation.
- The management objective must be to reduce any level of noise, shock and lighting that may have an effect on persons or animals, both inside the plant area and that which may migrate outside the plant area.
- When the equivalent noise exposure, as defined in the South African Bureau of Standards Code of Practice for the Measurement and Assessment of Occupational Noise for Hearing Conservation Purposes, SABS 083 as amended, in any place at or in any mine or works where persons may travel or works exceeds 82 dB (A), the site manager will take the necessary steps to reduce the noise below this level.
- Hearing protection must be provided to all employees where attenuation cannot be implemented.
- If any complaints are received from the public or state department regarding noise levels the levels will be monitored at prescribed monitoring points.

Mechanical equipment

- All mechanical equipment must be in good working order and vehicles must adhere to the relevant noise requirements of the Road Traffic Act.
- All vehicles in operation must be equipped with a silencer on its exhaust system.
- Safety measures, which generate noise such as reverse gear alarms on large vehicles, must be appropriately calibrated / adjusted.

Safety

- No employees may reside on the prospecting site.
- Access and haul roads must be maintained.
- Security access point to ensure monitoring of access to the site.

Archaeology:

- All operators of equipment should be made aware of the possibility of the occurrence of sub-surface heritage features and the following procedures should they be encountered:
    - All activity in the immediate vicinity (50m radius of the site) should cease.
    - The heritage practitioner should be informed as soon as possible.
    - In the event of obvious human remains the SAPS should be notified.
    - Mitigation measures (such as refilling) should not be attempted.
    - The area in a 50m radius of the find should be cordoned off with hazard tape.
    - Public access should be limited.
    - No media statement should be released until such time as the heritage practitioner has had sufficient time to analyse the finds.

Chance Find Protocol

- Monitoring Programme for Palaeontology – to commence once the excavations / drilling activities begin.
- The following procedure is only required if fossils are seen on the surface and when drilling/excavations commence.
- When excavations begin the rocks and must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (plants, insects, bone, coal) should be put aside in a suitably protected place. This way the project activities will not be interrupted.
- Photographs of similar fossil plants must be provided to the developer to assist in recognizing the fossil plants in the shales and mudstones (for example see Figure 1.5). This information will be built into the EMP's training and awareness plan and procedures.
- Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment.
- If there is any possible fossil material found by the developer/environmental officer/miners then the qualified palaeontologist sub-contracted for this project, should visit the site to inspect the selected material and check the dumps where feasible.
- Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site a

SAHRA permit must be obtained. Annual reports must be submitted to SAHRA as required by the relevant permits.

- If no good fossil material is recovered then no site inspections by the palaeontologist will not be necessary. A final report by the palaeontologist must be sent to SAHRA once the project has been completed and only if there are fossils.
- If no fossils are found and the excavations have finished then no further monitoring is required.

Visual

- Security Lights must be fixed at an angle to ensure that it does not cause a disturbance to the surrounding environment at night
- Prospecting Areas must be subject to progressive controlled backfilling and made safe (including the re-establishment of vegetation).
- Permanent structures or features that are part of the proposed prospecting operation must be kept neat and well presented.
- Waste material of any description must be removed from the prospecting area on a regular basis and be disposed of at a recognized landfill facility.

The **impact management objectives** for the Bokamoso planned prospecting operation should include:

- To ensure efficient extraction of the diamonds and to prevent the sterilization of any diamond reserves.
- To limit the alteration of the surrounding topography
- To manage and preserve soil types
- To prevent the loss of land capability
- To ensure the continuation of economically viable land use.
- To ensure that the surrounding ground water resources are not adversely affected to the detriment of the health and welfare of nearby communities; and to ensure suitable quality of ground water resources.
- To ensure that the surrounding surface water resources are not adversely affected to the detriment of the health and welfare of nearby communities; and to ensure suitable quantity and quality of ground water resources.
- The non-perennial stream is classified as a water system according to GN704 and is a natural storm water accumulation stream. No water system shall be mined before an authorization is obtained from DWS. This water system will however not be mined.
- Rehabilitation of disturbed areas during the prospecting life cycle as well as during closure phase has to be done to minimize erosion and/or pollution of natural streams.
- To contain soils and materials within demarcated areas and prevent contamination of storm water runoff.
- To minimise the loss of natural vegetation.
- To prevent the proliferation of alien invasive plants species.
- To protect the wildlife and bird species.
- To protect the natural habitat of wildlife and bird species.
- To maintain visual integrity; and to minimise the extent of the generation of dust in order to minimise the aspect of nuisance and health impacts to sensitive receptors.

- To minimise noise and vibration to a level that disturbances felt by the communities are limited.
- To reduce the impact on visual quality due to intrusive infrastructure, activities and facilities.
- To ensure that all traffic generated by the proposed prospecting development does not negatively impact on existing road networks and infrastructure; and to ensure traffic safety.
- To preserve the historical and cultural artefacts located on site in compliance with the South African Heritage Resources Act, 1999 (Act No 25 of 1999).
- To ensure that the current socio-economic status quo is improved.
- To be transparent and practise effective communication; in order to maintain good relationships with all interested and affected parties.

m) Final proposed alternatives

(Provide an explanation for the final layout of the infrastructure and activities on the overall site as shown on the final site map together with the reasons why they are the final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment)

The consideration of alternatives is a critical component of the EIA process, where an appropriate range of alternatives require consideration whilst achieving the desired objective of the proposed project. In order to ensure that the proposed project enables sustainable prospecting, a number of feasible options will be explored. The various alternatives in terms of land use, project infrastructure, method and proceeding without the prospecting operation will be assessed in terms of logistical practicality, environmental acceptability and economic feasibility. Alternatives for the locality of the prospecting operation will however not form part of this consideration, as the location of the prospecting site is determined by the possible geological location of the mineral resource.

n) Aspects for inclusion as conditions of Authorisation

Any aspects which have not formed part of the EMPr that must be made conditions of the Environmental Authorisation

The general conditions; including management of activity, monitoring, recording and reporting to the Department, commissioning of the activity, operation of the activity, site closure and decommissioning as well as non-compliances; as required in terms of the Environmental Impact Assessment Regulations promulgated in terms of NEMA (Act 107 of 1998) as well as objectives and requirements of relevant legislation, policies and guidelines must be included in the Authorization.

o) Description of any assumptions, uncertainties and gaps in knowledge

(Which relate to the assessment and mitigation measure proposed)

The above mitigation measures are tried and tested over many years in the diamond prospecting industry. The Company must monitor the potential impacts throughout the life of operation, and mitigate any deviations detected. This has been proven to be very effective in existing operations.

The EAP who compiled this document and the specialists who compiled the respective specialist reports have extensive knowledge in their field and it is therefore assumed that the above assumptions are adequate and that the information provided is correct.

p) Reasoned opinion as to whether the proposed activity should or should not be authorised

i) Reasons why the activity should be authorized or not.

There are no significant reasons why the activity should not be authorised. However, if the proposed management and mitigation measures are not properly applied or if the prospecting operation intentionally disregards any of these measures, it will negatively affect the environment and have more long-term consequences. Therefore, the competent authority should take all the necessary steps to ensure that the prospecting operation complies with the conditions set out in the approval of the EMPR.

iv) Conditions that must be included in the authorisation.

(1) Specific conditions to be included into the compilation and approval of EMPr

The general conditions; including management of activity, monitoring, recording and reporting to the Department, commissioning of the activity, operation of the activity, site closure and decommissioning as well as non-compliances; as required in terms of the Environmental Impact Assessment Regulations promulgated in terms of NEMA (Act 107 of 1998) as well as objectives and requirements of relevant legislation, policies and guidelines must be included in the Authorization.

(2) Rehabilitation requirements

A Detailed rehabilitation plan is included in the EMPR as alluvial diamond prospecting consist of continuous stripping and backfilling operations. The Mine had to provide to the DMR, a financial rehabilitation guarantee to the amount as calculated in terms of the financial quantum Guideline and approved by the DMR.

Infrastructure areas

On completion of the prospecting operation, the various surfaces, including the access road, the office area, storage areas and the plant site, will finally be rehabilitated as follows: All other material on the surface will be removed to the original topsoil level where possible. This material will then be backfilled into any open pits. Any compacted area will then be ripped to a depth of 300mm, where possible, the topsoil or growth medium returned and landscaped.

All infrastructures, equipment, plant, and other items used during the operational period will be removed from the site.

On completion of operations, all buildings, structures or objects on the office site will be dealt with in accordance with regulation 44 of the Minerals and Petroleum Resources Development Act, 2002.

Topsoil and Stockpile Deposits:

Disposal Facilities: Waste material of all description inclusive of receptacles, scrap, rubble and tyres should be removed entirely from the prospecting area and disposed of at a recognized landfill facility. It should not be permitted to be buried or burned on the site.

Ongoing Seepage, Control of Rain Water:

Water Quality Management in accordance with the South African Water Quality Guidelines must be adhered to in order to provide timely and accurate water data to the Department of Water and Sanitation (DWS) as well as to manage impacts caused by the activity. Specific objectives of such a program are to:

- Determine whether water quality comply with water quality standards.
- Provide timely data for intervention as and when required.
- Assess the status of water quality in the surrounding areas.
- Provide analytical water quality information describing trends (present conditions and changes).

The objectives are to limit the adverse effect of pollutants in the water resource. The setting of in-stream Resource Water Quality Objectives (RWQO) is based on the South African Water Quality Guidelines.

Water Monitoring Points

Surface water: The Vaal River borders the prospecting area, water will be used from the river under a water use licence from DWS. Monitoring takes place by collecting surface water samples every quarter if possible and required by DWS.

Long Term Stability and Safety: It should be the objective of mine management to ensure the long-term stability of all rehabilitated areas including the backfilled depressions. This should be done by the monitoring of all areas until a closure certificate has been issued.

Final rehabilitation in respect of erosion and dust control: Self-sustaining vegetation will result in the control of erosion and dust and no further rehabilitation is deemed necessary, unless vegetation growth is not returned to a desirable state by the time of mine closure.

Final Rehabilitation Roads:

- After rehabilitation has been completed, all roads should be ripped or ploughed, fertilized and providing the landowner does not want them to remain that way and with written approval from the Director: Mineral Development of the Department of Mineral Resources and Energy.

Submission of Information:

- Reports on rehabilitation and monitoring should be submitted annually to the Department of Mineral Resources – Kimberley, as described in Regulation 55 and NEMA (amended).

Maintenance (Aftercare):

- Maintenance after closure should include the regular inspection and monitoring and/or completion of the re-vegetation programme.
- The aim of the Environmental Management Programme is for rehabilitation to be stable and self-sufficient, so that the least possible aftercare is required.
- The aim with the closure of the mine should be to create an acceptable post-mine environment and land-use. Therefore, all agreed commitments should be implemented by Mine Management.

After-effects Following Closure:

Acid Mine Drainage: No potential for bad quality leachate or acid mine drainage development is associated with diamond mine closure.

Long Term Impact on Ground Water: No after effect on the groundwater yield or quality is expected.

Long-term Stability of Rehabilitated Land: One of the main aims of any rehabilitated ground should be to obtain a self-sustaining and stable end result. The concurrent monitoring of all material and replacement of topsoil where available should be ensured.

q) Period for which the Environmental Authorisation is required

5 years. With the option to renew for a further 3 years.

r) Undertaking

Confirm that the undertaking required to meet the requirements of this section is provided at the end of the EMPr and is applicable to both the Basic Assessment Report and the Environmental Management Programme Report.

The undertaking required to meet the requirements of this section is provided at the end of the EMPR and is applicable to both the Environmental Impact Assessment Report and the Environmental Management Programme Report.

s) Financial Provision

State the amount that is required to both manage and rehabilitate the environment in respect of rehabilitation

i) Explain how the aforesaid amount was derived

The total cost to rehabilitate and mitigate the Bokamoso site as it stands currently (risking premature rehabilitation) is estimated to be R239 421 according to the DMR calculations.

ii) Confirm that this amount can be provided from operating expenditure

(Confirm that the amount, is anticipated to be an operating cost and is provided for as such in the Mining Work Programme, Financial and Technical Competence Report or Prospecting Work Programme as the case may be)

It is confirmed that the amount for outstanding rehabilitation can be provided from operating expenditure.

t) Deviations from the approved scoping report and plan of study

i) Deviations from the methodology used in determining the significance of potential environmental impacts and risks

(Provide a list of activities in respect of which the approved scoping report was deviated from, the reference in this report identifying where the deviation was made, and a brief description of the extent of the deviation)

Not applicable – No deviations from the methodology proposed in the Scoping Report.

ii) Motivation for the deviation

Not applicable – No deviations from the methodology proposed in the Scoping Report.

u) Other information required by the competent Authority

i) Compliance with the provisions of sections 24 (4)(a) and (b) read with section 24 (3)(a) and (7) of the National Environmental Management Act (Act 107 of 1998), the EIA Report must include the:-

(1) Impact on the socio-economic conditions of any directly affected person

(Provide the results of investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any directly affected person including the landowner, lawful occupier, or, where applicable, potential beneficiaries of any land restitution claim, attach the investigation report as **Appendix 2.19.1** and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6 and 2.12 therein)

From a social perspective it can be concluded that the proposed Bokamoso Project would not result in permanent damaging social impacts. The socio-

economic benefits associated with the mine outweigh the negative social impacts. It is thus concluded that the proposed project is acceptable from a social point of view, provided that mitigation measures are implemented.

(2) Impact on any national estate referred to in section 3(2) of the National Heritage Resources Act (Provide the results of investigation, assessment, evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any national estate referred to in section 3(2) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) with the exception of the national estate contemplated in section 3(2)(*i)*(vi) and (vii) of that Act, attach the investigation report as **Appendix 2.19.2** and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6 and 2.12 herein)

A Heritage Impact Assessment (HIA) study has been conducted on behalf of Bokamoso Exploration (Pty) Ltd to support a mine prospecting right application on Portion 6 of the Farm Elandsdrift 159 and the Remaining Extent of Portion 1 of the Farm Slangheuvel 160, near Barkly West in the Dikgatlong Local Municipality, Northern Cape Province. This entailed a ground survey which was conducted on 9th and 10th June 2021 for the possible occurrence archaeological and historical material on the property. This report has been prepared in compliance with Section 38(8) of the National Heritage Resources Act (No 25 of 1999) and mitigation measures recommended in this report will be considered as part of Environmental Impact Assessment.

The heritage sensitivity of the property is summarised as follows:

The Stone Age

A few stone tools were found. The occurrence of a cleaver (BMK08) shows the Early Stone Age origins of the stone tool cultures which became well established in subsequent epochs of the Stone Age, i.e. the Middle and Late State Age. None of the finds warrants further action.

The Iron Age

No material dating to the Iron Age was found.

Historic buildings

There are a number of buildings of different typologies on the property. Together they constitute the built environment typical of many farms in the broader area. Increasingly this is being recognised as a cultural landscape of heritage significance. The circular fields under pivot irrigation add another key element to the landscape as they are a common occurrence on the silt banks of the Vaal and Orange Rivers. None of buildings will be affected by the prospecting and mining operations.

Burial grounds

Two burial grounds were recorded (BMK04, BMK13). It is recommended that the burial grounds are fenced off and 100 m buffer reserved in accordance with SAHRA minimum standards. If operations will encroach into the buffer area, a permit must be obtained from SAHRA.

The mine prospecting application may be given a green light to go ahead with the recommendations heeded to avoid the burial grounds. As a standard procedure, in the event of other heritage resources being discovered in future phases of the project, the Provincial Heritage Resources Authority or SAHRA must be alerted immediately and an archaeologist or heritage expert called to attend.

Palaeontology

Based on the geology of the area and the palaeontological record as we know it, it can be assumed that the formation and layout of the andesites, dolomites, sandstones, shales and sands are typical for the country and some do contain fossil plant, insect, invertebrate and vertebrate material. There have been no records from this area to date so it is unknown f they occur here. The sands of the Quaternary period would not preserve fossils.

Based on experience and the lack of any previously recorded fossils from the area, it is unlikely that any fossils would be preserved in the sands and alluvium of the Quaternary. There is a small chance that fossils may occur in the shales of the early Permian Prince Albert Formation (Ecca Group, Karoo Supergroup) so a Fossil Chance Find Protocol should be added to the EMPr. If fossils are found once excavating and prospecting have commenced then they should be rescued and a palaeontologist called to assess and collect a representative sample.

Monitoring Programme for Palaeontology – to commence once the excavations / drilling / mining activities begin.

1. The following procedure is only required if fossils are seen on the surface and when drilling/excavations/prospecting commence.
2. When excavations begin the rocks and must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (plants, insects, bone, coal) should be put aside in a suitably protected place. This way the project activities will not be interrupted.
3. Photographs of similar fossils must be provided to the developer to assist in recognizing the fossil plants, vertebrates, invertebrates or trace fossils in the shales and mudstones. This information will be built into the EMP's training and awareness plan and procedures.
4. Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment.
5. If there is any possible fossil material found by the developer /environmental officer/miners then the qualified palaeontologist

sub-contracted for this project, should visit the site to inspect the selected material and check the dumps where feasible.

6. Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site a SAHRA permit must be obtained. Annual reports must be submitted to SAHRA as required by the relevant permits.
7. If no good fossil material is recovered then no site inspections by the palaeontologist will be necessary. A final report by the palaeontologist must be sent to SAHRA once the project has been completed and only if there are fossils.
8. If no fossils are found and the excavations have finished then no further monitoring is required.

v) Other matters required in terms of sections 24(4)(a) and (b) of the Act

(the EAP managing the application, must provide the competent authority with detailed, written proof of an investigation as required by section 24(4)(b)(i) of the Act and motivation if no reasonable or feasible alternatives, as contemplated in sub-regulation 22(2)(h), exist. The EAP must attach such motivation as **Appendix 4**)

There are no alternatives, as the application area applied for is the area where the applicant have identified potential for a diamond prospecting operation.

PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

1) Draft environmental management programme

a) Details of the EAP (Confirm that the requirement for the provision of the details and expertise of the EAP are already included in PART A, section 1(a) herein as required)

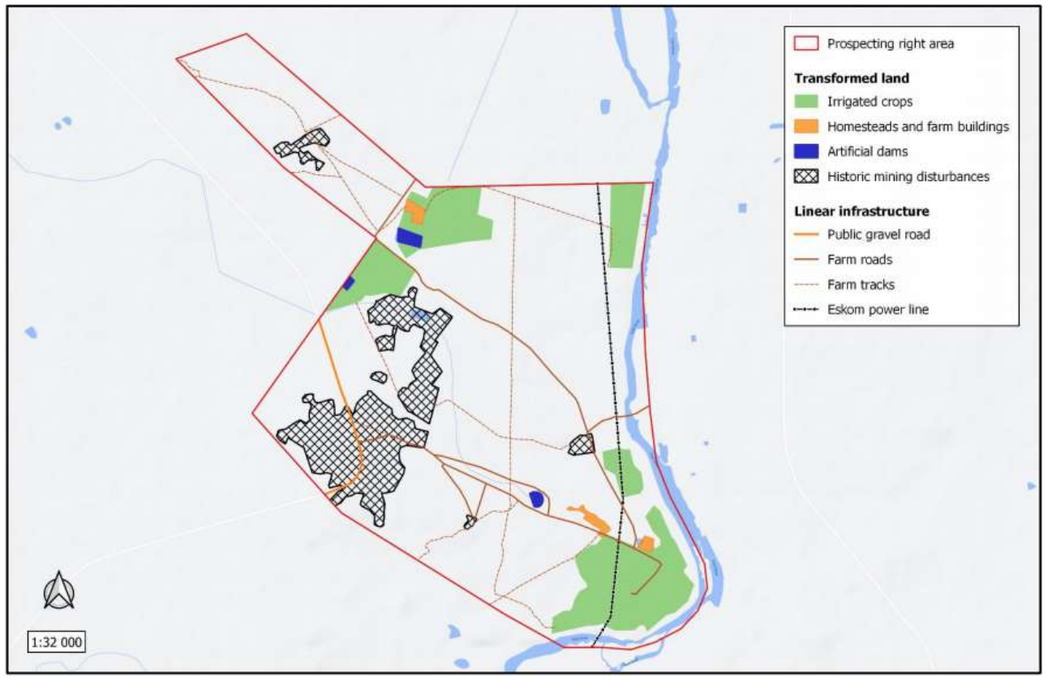
I hereby confirm that the requirement for the provision of the details and expertise of the EAP is already included in Part A as required.

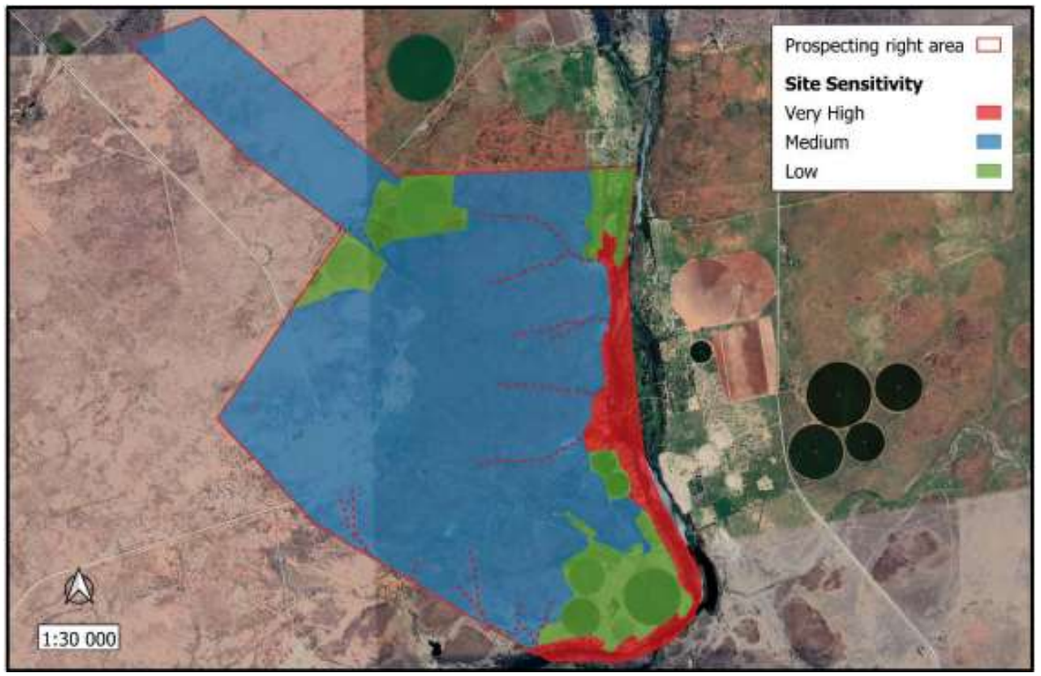
b) Description of the Aspects of the Activity (Confirm that the requirement to describe the aspects of the activity that are covered by the draft environmental management programme is already included in PART A, section (1)(h) herein as required)

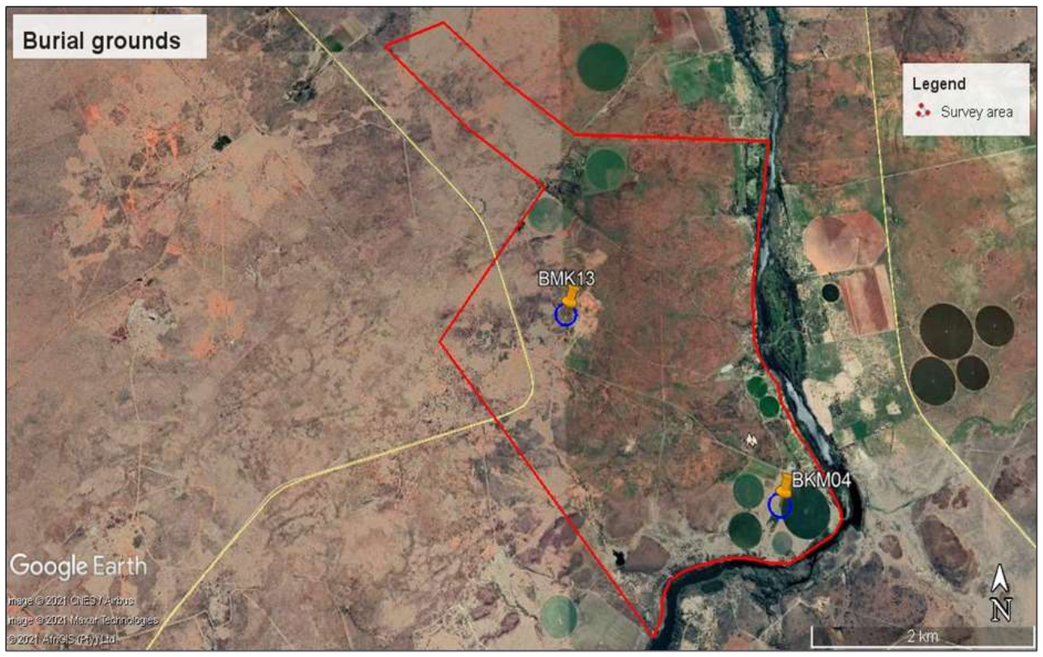
I hereby confirm that the requirement for the aspects of the activity is already included in Part A as required.

c) Composite Map

(Provide a map **(Attached as an Appendix)** at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers)







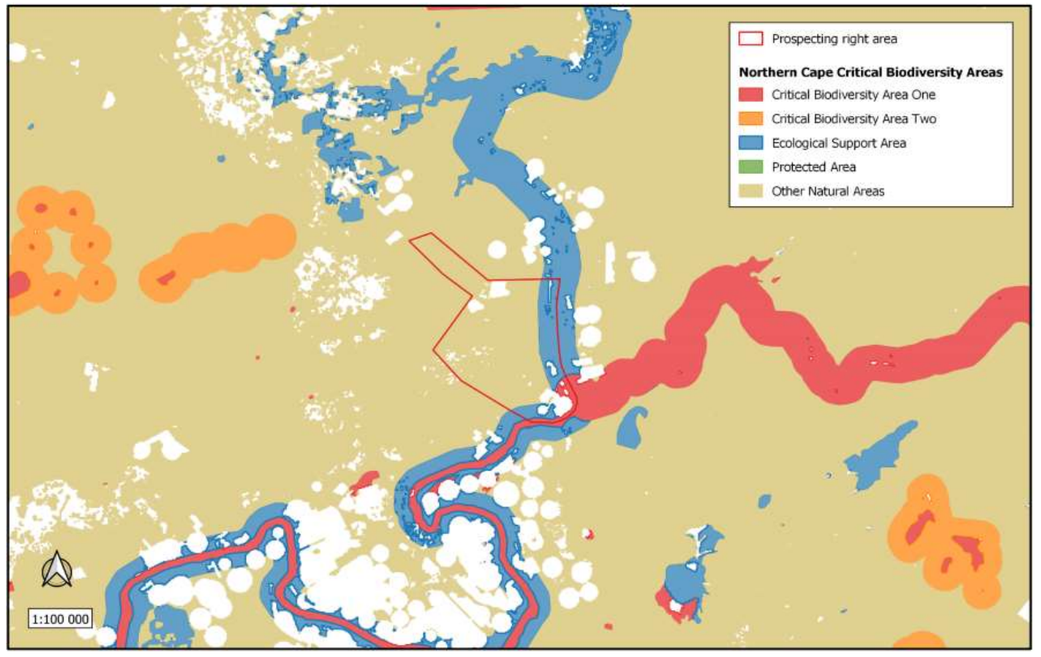


Figure 31 a, b, c, d. A sensitivity map for the Bokamoso prospecting area indicating areas of high (orange) and very high (red) sensitivity.

d) Description of impact management objectives including management statements

i) Determination of closure objectives (ensure that the closure objectives are informed by the type of environment described in 2.4 herein)

The main closure objectives of the Company's planned prospecting operation are:

- To restore the site to its current land capability in a sustainable manner.
- To prevent the sterilization of any diamond reserves.
- To prevent the establishment of any permanent structures or features.
- To manage and limit any impact to the surface and groundwater aquifers in such a way that an acceptable water quality and yield can still be obtained when a closure certificate is issued.
- To establish a stable and self-sustainable vegetation cover.
- To limit and rehabilitate any erosion features and prevent any permanent impact to the soil capability.
- To limit and manage the visual impact of the prospecting activities.
- To safeguard the safety and health of humans and animals on the site.
- To close the prospecting operation efficiently, cost effectively and in accordance with Government Policy.

The key aim decommissioning and closure is to ensure that all the significant impacts are ameliorated. All rehabilitated areas should be left in a stable, self-sustainable state. Proof of this should be submitted at closure. Specific objectives include:

Rehabilitation of infrastructure areas

The objectives for the removal of infrastructure and the subsequent rehabilitation of the areas they occupied include:

- To ensure that infrastructure identified for removal is successfully demolished and removed.
- To ensure that infrastructure identified to remain after mine closure is maintained until the issue of a closure certificate.
- The removal, decommissioning and disposal of all prospecting infrastructure, will comply with all conditions contained in the MPRDA. To this end, decommissioning and rehabilitation of all infrastructure areas will follow the following principles:
- The plant and associated disused infrastructure will be dismantled or demolished. Any building foundations will be removed and land exposed to the demolition and dismantling of infrastructure and all other disturbed land will be rehabilitated.
- Rubble will be disposed of at a suitable site. The site will be selected in consultation with DENC.

- Any surface water management infrastructure will be maintained to ensure they are stable and functional.
- Just before closure, when disturbed land has been rehabilitated and erosion is controlled by vegetation cover, all disused surface water management facilities will be decommissioned.

Mine Residue Dump

The objectives pertaining to the effective management and rehabilitation of the Mine Residue Dump include:

- To ensure that the Mine Residue Dump deposits are stable and that there is an acceptably low risk of failure of these deposits during the decommissioning phase and following mine closure; To establish self-sustainable vegetation cover on the Mine Residue dump so that the visual impact of the Mine Residue dump is improved and in order to prevent erosion.

Management principles pertaining to Mine Residue dump include:

- The Mine Residue dump /s will continuously be inspected by a suitable qualified professional engineer to ensure their stability. If they are unstable, the appropriate remedial measures will be implemented.
- Inspection and monitoring should continue until a suitable qualified profession engineer has confirmed the long-term stability of the Mine Residue dump.
- Any infrastructure or facilities that serve the Mine Residue dump will be maintained to ensure that they are both stable and functional.

Maintenance

The necessary agreements and arrangement will be made by the Bokamoso operation to ensure that all natural physical, chemical and biological processes for which a closure condition were specified are monitored until they reach a steady state or for three (3) years after closure or as long as deemed necessary at the time.

- Such processes include erosion of the rehabilitated areas, Residue dump, rehabilitated surfaces, surface water drainage, air quality, surface water quality, ground water quality, vegetative re-growth, weed encroachment.
- The closure plan will be reviewed yearly.
- Rehabilitation of the land will be maintained until a closure certificate is granted or until the land use is regarded as sustainable.
- All rehabilitated areas will be monitored and maintained until such time as required to enable the prospecting activity to apply for closure of these different areas.

Performance assessments

As per the MPRDA and associated Regulations, as well as NEMA and associated Regulations, this Environmental Management Programme will be continually assessed in terms of its appropriateness and adequacy. In order to achieve this, the Bokamoso operation will undertake the following:

- Implement the necessary monitoring programmes, as discussed as part of this EMPR;
- Conduct performance assessments of this EMPR biennially; and
- Compile and submit the afore-mentioned performance assessment reports to the DMR. The frequency of the performance assessments will be biennially. An independent and competent person will undertake all performance assessments.

Decommissioning and closure objectives

The key aim decommissioning and closure is to ensure that all the significant impacts are ameliorated. All rehabilitated areas will be left in a stable, self-sustainable state. Proof of this will be submitted at closure. Specific objectives include:

- To identify potential post-closure land uses in consultation with the surrounding land owners and land users. This should be done during the operational phase of the prospecting operation;
- Rehabilitate disturbed land to a state suitable for its post-closure uses;
- Rehabilitate disturbed land and mine residue deposits to a state that facilitates compliance with applicable environmental quality objectives;
- Keep relevant authorities informed of the progress of the decommissioning phase;
- Submit monitoring data to the relevant authorities;
- Maintain required pollution control facilities and rehabilitated land until closure.

Negative economic impacts

The objective is to alleviate the negative socio-economic impacts that will result from mine closure. Management principles to achieve this include:

- The Bokamoso operation will undertake a carefully planned step-wise decommissioning process.
- Closure planning will form an integral part of prospect planning.
- Strategies for sustainable development have been and will continue to be developed by the project in collaboration with district and local authorities, local businesses and other interested parties. Early warning of impending closure will be given to IAPs.
- In conjunction with long-term closure planning, the operation will actively participate in regional and local planning to enhance the economic benefits of the project through development of alternative forms of income generation.

- The Bokamsoso operation will initiate and participate in regional planning exercises that will mitigate the impacts of closure of the operation, the local and regional economies and associated abandonment of community infrastructures surrounding the prospecting activities.

ii) The process for managing any environmental damage, pollution, pumping and treatment of extraneous water or ecological degradation as a result of undertaking a listed activity

There won't be a need for this, as based on the specialist reports. No pitting or trenching will go deep enough to encounter any groundwater.

iii) Potential risk of Acid Mine Drainage (Indicate whether or not the mining can result in acid mine drainage)

No potential risk for Acid Mine Drainage exists.

iv) Steps taken to investigate, assess, and evaluate the impact of acid mine drainage

Not applicable, there is no potential risk of acid mine drainage.

v) Engineering or mine design solutions to be implemented to avoid or remedy acid mine drainage

Not applicable, there is no potential risk of acid mine drainage.

vi) Measures that will be put in place to remedy any residual or cumulative impact that may result from acid mine drainage

There is no residual or cumulative impact that may result from acid mine drainage.

vii) Volumes and rate of water use required for the mining, trenching or bulk sampling operation

There will be two 16 feet pans that will require water when bulk sampling is reached. The only other activity relating to the cost of water in the prospecting operation relates to dust suppression in the prospecting area and on the roads when hauling and transporting material to the processing plant on the farms as part of the rehabilitation process.

It must however be noted that the water supply to the activities will be sourced from the Vaal River. The necessary Water Use Licence will be applied for.

The processing plant (diamond pan) scrubbers and final recovery will have an impact on the cost of water used. The cost of water will have an upward trend over time as a result of the national capacity and demand situation. Water are however recycled as far as possible and redirected to the processing plant.

viii) Has a water use licence been applied for?

A Water use Licence application (WULA) will be prepared and submitted as soon as the EIA EMP has been submitted as this document and the Right is a minimum requirement for the application.

ix) Impact to be mitigated in their respective phases

Measure to rehabilitate the environment affected by the undertaking of any listed activity

ACTIVITY Whether listed or not listed. (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc… etc… etc.).	**PHASE** of operation in which activity will take place. State; Planning and design, Pre-Construction' Construction, Operational, Rehabilitation, Closure, Post closure.	**SIZE AND SCALE** of disturbance (volumes, tonnages and hectares or m^2)	**MITIGATION MEASURES** (describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)	**COMPLIANCE WITH STANDARDS** (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	**TIME PERIOD FOR IMPLEMENTATION** Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when Required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:-.. Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
Processing Plant 2 x 16ft rotary pan plants with de-watering screens	Construction Commissioning Operational Decommissioning Closure	Steel, concrete, electric wires	Access control Maintenance of processing plant Dust control and monitoring Noise control and monitoring		Removal of processing plant upon closure of prospecting right.

			Drip trays Storm water run-off control Immediately clean hydrocarbon spills Rip disturbed areas to allow re-growth of vegetation cover		
Ablution facilities Chemical toilets	Construction Commissioning Operational Decommissioning Closure	Chemical toilets for	Maintenance of chemical toilets Removal of chemical toilets upon closure		Removal of chemical toilets upon closure of the Prospecting Right.
Clean & Dirty water systems: Berms	Construction Commissioning Operational Decommissioning Closure	This area also includes the re-fuel and lubrication station, wash bay and office area. Due to the nature of activity in this area, lining of this catchment dam is proposed. The storage water will be used for prospecting activities for example dust suppression, prospecting process, wash bay, etc.	Maintenance of berms and trenches Oil traps used in relevant areas. Drip trays used. Immediately clean hydrocarbon spill.		Upon cessation of the individual activity (continuous rehabilitation)

Fuel Storage facility (Diesel tanks)	Construction Commissioning Operational Decommissioning Closure	Concrete, bricks, and steel	Maintenance of diesel tanks and bund walls. Oil traps Drip tray at re-fuelling point Immediately clean hydrocarbon spill.		Removal of diesel tanks upon closure of Prospecting Right.
Prospecting Area.	Commissioning Operational Decommissioning Closure	Provision is made for a maximum footprint (at full production) of 20 hectares at any one time.	No dumping of materials prior to approval by exploration geologist; Proper planning of excavations Access control Dust control and monitoring Noise control and monitoring Continuous rehabilitation Stormwater run-off control Immediately clean hydrocarbon spill Drip trays Dump control and monitoring Erosion control		Upon cessation of the individual activity (continuous rehabilitation)
Salvage yard (Storage and laydown area)	Construction Commissioning Operational	No construction material, area to be levelled with a	Access control Maintenance of fence		Removal of fence around salvage yard and ripping of salvage yard area upon

	Decommissioning Closure	grader and fenced with a gate and access control	Storm water run-off control Immediately clean hydrocarbon spill		closure of the prospecting right.
Gravel Stockpile area	Commissioning Operational Decommissioning Closure	Provision is made for a maximum footprint (at full production) of 0.01ha for the stockpile area at any one time.	Dust control and monitoring Noise control and monitoring Drip trays Storm water run-off control. Immediately clean hydrocarbon spills. Rip disturbed areas to allow re-growth of vegetation cover		Ripping of stockpile area upon closure of prospecting right.
Waste disposal site (domestic and industrial waste):	Construction Commissioning Operational Decommissioning Closure	15m x 30m = 450m²	Storage of Waste within receptacles Storage of hazardous waste on concrete floor with bund wall Removal of waste on regular intervals		Removal of waste receptacles, breaking and removal of rubble from the concrete floors and bund walls upon closure of prospecting right.
Roads (both access and haulage road on the mine site):	Construction Commissioning Operational Decommissioning Closure	Additional mine haul road	Maintenance of roads Dust control and monitoring Noise control and monitoring Speed limits Storm water run-off control		Upon cessation of the individual activity (continuous rehabilitation) Ripping of roads upon closure of the prospecting right.

			Erosion control Immediately clean hydrocarbon spills Rip disturbed areas to allow re-growth of vegetation cover		
Workshop and Wash bay	Construction Commissioning Operational Decommissioning Closure	300m² Concrete and Steel	Concrete floor with oil/water separator Storm water run-off control Immediately clean hydrocarbon spills		Removal of wash bay equipment, breaking and removal of rubble from the concrete floors and bund walls upon closure of prospecting right
Water distribution Pipeline	Construction Commissioning Operational Decommissioning Closure	HDPE Pipes	Maintain water pipeline and structures		Removal of pipeline upon closure of the prospecting right.
Water tanks:	Construction Commissioning Operational Decommissioning Closure	3m X 3m = 9m²	Maintain water tanks and structures		Removal of water tank and steel structure upon closure of the prospecting right.

e) Impact Management Outcomes

(A description of impact management outcomes, identifying the standard of impact management required for the aspects contemplated in paragraph()

ACTIVITY **Whether listed or not listed.**	**POTENTIAL IMPACT** **(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater, contamination, air pollution)….**	**ASPECTS AFFECTED**	**PHASE** **In which impact is anticipated** **(e.g. construction, commissioning, operational, Decommissioning, closure, post closure)**	**MITIGATION TYPE** (modify, remedy, control or stop) through (e.g. noise control measures, storm water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity	**STANDARD TO BE ACHIEVED** **(impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.**
Processing Plant 2 X 16 feet pans	Dust Noise Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance	Air Quality Fauna Flora Noise Soil Surface water Safety	Construction Commissioning Operational Decommissioning Closure	Access control Maintenance of processing plant Dust control and monitoring Noise and vibration control and monitoring Drip trays Storm water run-off control Immediately clean hydrocarbon spills Rip disturbed areas to allow re-growth of vegetation cover Noise control Well maintained equipment Selecting equipment with lower sound power levels; Installing silencers for fans;	Safety ensured. Dust levels minimized Minimize potential for hydrocarbon spills to infiltrate into groundwater Noise levels minimized Rehabilitation standards and closure objectives to be met. Erosion potential minimized.

				Taking advantage during the design stage of natural topography as a noise buffer; Develop a mechanism to record and respond to complaints. Maintain a buffer zone of 100 m around the streams. Note that these buffer zones are essential to ensure healthy functioning and maintenance of wetland. Effluents and waste should be recycling and re-use as far as possible.	
Ablution facilities Chemical Toilets	Soil contamination Possible Groundwater contamination	Soil Groundwater	Construction Commissioning Operational Decommissioning Closure	Maintenance of sewage facilities on a regular basis. Removal of chemical toilets on closure	Minimize the potential for a chemical spill on soil, which could infiltrate to groundwater.
Clean & Dirty water systems:	Surface disturbance Groundwater Contamination Soil contamination	Soil Groundwater Surface Water	Construction Commissioning Operational Decommissioning Closure	It will be necessary to divert storm water around dump areas by construction of a cut-off berm that will prevent surface run-off into the prospecting area.	Safety ensured. Minimize potential for hydrocarbon spills to infiltrate into groundwater. Rehabilitation standards and closure objectives to be met.

	Surface water contamination			The re-vegetation of disturbed areas is important to prevent erosion and improve the rate of infiltration. Erosion channels that may develop before vegetation has established should be rehabilitated by filling, levelling and re-vegetation where topsoil is washed away. Maintenance of trenches Monitoring and maintenance of oil traps in relevant areas. Drip trays used. Immediately clean hydrocarbon spill. Linear infrastructure such as roads and pipelines will be inspected at least monthly to check that the associated water management infrastructure is effective in controlling erosion. Maintain a buffer zone of 100 m around the streams. Note that these buffer	

				zones are essential to ensure healthy functioning and maintenance of wetland. Effluents and waste should be recycling and re-use as far as possible.	
Fuel Storage facility (Diesel tanks)	Groundwater contamination Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance	Soil Groundwater Surface water	Construction Commissioning Operational Decommissioning Closure	Maintenance of Diesel tanks and bund walls. Oil traps Drip tray at re-fuelling point. Refuelling must take place in well demarcated areas and over suitable drip trays to prevent soil pollution. Spill kits to clean up accidental spills from earthmoving machinery must be well-marked and available on site. Workers must undergo induction to ensure that they are prepared for rapid clean-up procedures. All facilities where dangerous materials are stored must be contained in a bund wall.	Minimize potential for hydrocarbon spills to infiltrate into groundwater. Rehabilitation standards and closure objectives to be met.

				Vehicles and machinery should be regularly serviced and maintained.	
Prospecting Area	Dust Noise Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance Surface water contamination	Air quality Fauna Flora Groundwater Noise and vibration Soil Surface Water Topography Safety	Commissioning Operational Decommissioning Closure	Access control Dust control and monitoring Noise and vibration control and monitoring Continuous rehabilitation Storm water run-off control Immediately clean hydrocarbon spill Drip trays Dump stability control and monitoring Erosion control Noise control Well maintained equipment Selecting equipment with lower sound power levels; Taking advantage during the design stage of natural topography as a noise buffer; Develop a mechanism to record and respond to complaints. Maintain a buffer zone of 100 m around the streams.	Safety ensured. Dust levels minimized Minimize potential for hydrocarbon spills to infiltrate into groundwater Noise levels minimized Rehabilitation standards and closure objectives to be met. Erosion potential minimized.

				Note that these buffer zones are essential to ensure healthy functioning and maintenance of wetland. Prospecting activities must be planned, where possible in order to encourage (faunal dispersal) and should minimise dissection or fragmentation of any important faunal habitat type. The extent of the prospecting area should be demarcated on site layout plans (preferably on disturbed areas or those identified with low conservation importance). Appointment of a full-time ECO must render guidance to the staff and contractors with respect to suitable areas for all related disturbance, and must ensure that all contractors and workers undergo Environmental Induction prior to	

				commencing with work on site. All those working on site must undergo environmental induction with regards to fauna and in particular awareness about not harming or collecting species such as snakes, tortoises and owls which are often persecuted out of superstition. All those working on site must be educated about the conservation importance of the fauna and flora occurring on site. The environmental induction should occur in the appropriate languages for the workers who may require translation. Reptiles and amphibians that are exposed during the clearing operations should be captured for later release or translocation by a qualified expert.	

				Employ measures that ensure adherence to the speed limit. Careful consideration is required when planning the placement for stockpiling topsoil and the creation of access routes in order to avoid the destruction of habitats and minimise the overall prospecting footprint. The Footprint areas of the prospecting activities must be scanned for Red Listed and protected plant species prior to prospecting; Snares & traps removed and destroyed; and Maintenance of firebreaks. It will be necessary to divert storm water around dump areas by construction of a temporary berm that will prevent surface run-off into the drainage lines. The re-vegetation of disturbed areas is	

				important to prevent erosion and improve the rate of infiltration. Erosion channels that may develop before vegetation has established should be rehabilitated by filling, levelling and re-vegetation where topsoil is washed away.	
Salvage yard (Storage and laydown area)	Groundwater contamination Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance Surface water contamination	Fauna Flora Groundwater Soil Surface Water	Construction Commissioning Operational Decommissioning Closure	Access Control Maintenance of fence Storm water run-off control Immediately clean hydrocarbon spill	Minimize potential for hydrocarbon spills to infiltrate into groundwater Rehabilitation standards and closure objectives to be met. Erosion potential minimized.
Gravel Stockpile area	Dust Noise Removal and disturbance of vegetation cover and	Air Quality Fauna Flora Noise Soil Surface Water	Commissioning Operational Decommissioning Closure	Dust Control and monitoring Noise control and monitoring Drip trays Storm water run-off control	Dust levels minimized Minimize potential for hydrocarbon spills to infiltrate into groundwater Noise levels minimized

	natural habitat of fauna Surface disturbance			Immediately clean hydrocarbon spills Rip disturbed areas to allow re-growth of vegetation cover Noise control Well maintained equipment Selecting equipment with lower sound power levels; Taking advantage during the design stage of natural topography as a noise buffer; Develop a mechanism to record and respond to complaints.	Rehabilitation standards and closure objectives to be met. Erosion potential minimized.
Waste disposal site (domestic and industrial waste):	Groundwater contamination Contamination of soil Surface water contamination	Groundwater Soil Surface water	Construction Commissioning Operational Decommissioning Closure	Storage of Waste within receptacles Storage of hazardous waste on concrete floor with bund wall Removal of waste on regular intervals	Minimize potential for hydrocarbon spills to infiltrate into groundwater Noise levels minimized Rehabilitation standards and closure objectives to be met.
Roads (both access and haulage road on the prospecting site):	Dust Noise Removal and disturbance of vegetation cover and	Air quality Fauna Flora Noise and vibration Soil Surface water	Construction Commissioning Operational Decommissioning Closure	Maintenance of roads Dust control and monitoring Noise control and monitoring Speed limits	Dust levels minimized Minimize potential for hydrocarbon spills to infiltrate into groundwater Noise levels minimized

	natural habitat of fauna Soil contamination Surface disturbance			Storm water run-off control Erosion control Immediately clean hydrocarbon spills Rip disturbed areas to allow re-growth of vegetation cover Noise control Well maintained equipment Selecting equipment with lower sound power levels; Taking advantage during the design stage of natural topography as a noise buffer; Develop a mechanism to record and respond to complaints. Linear infrastructure such as roads and pipelines will be inspected at least monthly to check that the associated water management infrastructure is effective in controlling erosion.	Rehabilitation standards and closure objectives met. Erosion potential minimized.
Workshop and Wash bay	Removal and disturbance of vegetation cover and	Groundwater Soil Surface water	Construction Commissioning Operational	Concrete floor with oil/water separator	Minimize potential for hydrocarbon spills to

	natural habitat of fauna Soil contamination		Decommissioning Closure	Storm water run-off control Immediately clean hydrocarbon spills	infiltrate into groundwater Noise levels minimized Rehabilitation standards and closure objectives to be met. Erosion potential minimized.
Water distribution Pipeline	Surface disturbance	Fauna Flora Surface Water	Construction Commissioning Operational Decommissioning Closure	Monitor pipeline for water leaks Maintenance of pipeline Linear infrastructure such as roads and pipelines will be inspected at least monthly to check that the associated water management infrastructure is effective in controlling erosion.	Rehabilitation standards and closure objectives to be met. Erosion potential minimized.
Water tanks:	Surface disturbance	Fauna Flora Surface Water	Construction Commissioning Operational Decommissioning Closure	Maintain water tanks and structures	Safety ensured. Rehabilitation standards and closure objectives to be met.

f) Impact Management Actions

(A description of impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraph (c)

ACTIVITY **Whether listed or not listed.**	**POTENTIAL IMPACT** **(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater, contamination, air pollution)….**	**MITIGATION TYPE** (modify, remedy, control or stop) through (e.g. noise control measures, storm water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity	**TIME PERIOD FOR IMPLEMENTATION** **Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required.** **With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either:- Upon cessation of the individual activity or Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.**	**COMPLIANCE WITH STANDARDS** (A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)
Processing Plant: 2 x 16ft rotary pan plants	Dust Noise Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance	Access control Maintenance of processing plant Dust control and monitoring Noise and vibration control and monitoring Drip trays Storm water run-off control Immediately clean hydrocarbon spills Rip disturbed areas to allow re-growth of vegetation cover Noise control Well maintained equipment Selecting equipment with lower sound power levels; Develop a mechanism to record and respond to complaints.	Removal of processing plant upon closure of Prospecting right.	The following must be placed at the site and is applicable to all activities: • Relevant Legislation; • Acts; • Regulations • COP's • SOP's Management and staff must be trained to understand the contents of these documents and to adhere thereto.

		Maintain a buffer zone of 100 m around the streams. Note that these buffer zones are essential to ensure healthy functioning and maintenance of wetland. Effluents and waste should be recycling and re-use as far as possible.		• Environmental Awareness training must be provided to employees. • The operation must have a rehabilitation and closure plan. • Management and staff must be trained to understand the contents of these documents, and to adhere thereto. Biennial performance Assessment Reports and annual quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMPr documents.
Ablution Facilities Chemical Toilets.	Soil contamination Groundwater contamination	Maintenance of sewage facilities on a regular basis. Removal of facility on closure	Removal of facility upon closure of the Prospecting Right.	The following must be placed at the site and is applicable to all activities: • Relevant Legislation; • Acts; • Regulations • COP's • SOP's Management and staff must be trained to understand the

				contents of these documents and to adhere thereto. • Environmental Awareness training must be provided to employees. • The operation must have a rehabilitation and closure plan. • Management and staff must be trained to understand the contents of these documents, and to adhere thereto. Biennial performance Assessment Reports and annual quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMPr documents.
Clean & Dirty water systems: Berms	Surface disturbance Groundwater Contamination Soil contamination Surface water contamination	It will be necessary to divert storm water around prospecting areas by construction of a berm that will prevent surface run-off into the prospecting area. The re-vegetation of disturbed areas is important to prevent erosion and improve the rate of infiltration. Erosion channels that may develop before vegetation has established	Upon cessation of the individual activity (continuous rehabilitation) Levelling of stormwater berms upon closure of Prospecting Right	The following must be placed at the site and is applicable to all activities: • Relevant Legislation; • Acts; • Regulations • COP's • SOP's

		should be rehabilitated by filling, levelling and re-vegetation where topsoil is washed away. Maintenance of trenches Monitoring and maintenance of oil traps in relevant areas. Drip trays used. Immediately clean hydrocarbon spill. Linear infrastructure such as roads and pipelines will be inspected at least monthly to check that the associated water management infrastructure is effective in controlling erosion. Maintain a buffer zone of 100 m around the streams. Note that these buffer zones are essential to ensure healthy functioning and maintenance of wetland. confining works in specific area or season, restoration (and possibly enhancement) of disturbed areas, etc. Effluents and waste should be recycling and re-use as far as possible.		Management and staff must be trained to understand the contents of these documents and to adhere thereto. • Environmental Awareness training must be provided to employees. • The operation must have a rehabilitation and closure plan. • Management and staff must be trained to understand the contents of these documents, and to adhere thereto. Biennial performance Assessment Reports and annual quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMPr documents.

Fuel Storage facility (Diesel tanks)	Groundwater contamination Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance	Maintenance of Diesel tanks and bund walls. Oil traps Drip tray at re-fuelling point. Refuelling must take place in well demarcated areas and over suitable drip trays to prevent soil pollution. Spill kits to clean up accidental spills from earthmoving machinery must be well-marked and available on site. Workers must undergo induction to ensure that they are prepared for rapid clean-up procedures. All facilities where dangerous materials are stored must be contained in a bund wall. Vehicles and machinery should be regularly serviced and maintained.	Removal of diesel tanks upon closure of Prospecting Right.	The following must be placed at the site and is applicable to all activities: • Relevant Legislation; • Acts; • Regulations • COP's • SOP's Management and staff must be trained to understand the contents of these documents and to adhere thereto. • Environmental Awareness training must be provided to employees. • The operation must have a rehabilitation and closure plan. • Management and staff must be trained to understand the contents of these documents, and to adhere thereto. Biennial performance Assessment Reports and annual quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMPr documents.

Prospecting Area.	Dust Noise Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance Surface water contamination	Access control Dust control and monitoring Noise and vibration control and monitoring Continuous rehabilitation Storm water run-off control Immediately clean hydrocarbon spill Drip trays Dump stability control and monitoring Erosion control Noise control Well maintained equipment Selecting equipment with lower sound power levels; Taking advantage during the design stage of natural topography as a noise buffer; Develop a mechanism to record and respond to complaints. Maintain a buffer zone of 100 m around the streams. Note that these buffer zones are essential to ensure healthy functioning and maintenance of wetland. Effluents and waste should be recycling and re-use as far as possible. Prospecting activities must be planned, where possible in order	Upon cessation of the individual activity (continuous rehabilitation)	The following must be placed at the site and is applicable to all activities: • Relevant Legislation; • Acts; • Regulations • COP's • SOP's Management and staff must be trained to understand the contents of these documents and to adhere thereto. • Environmental Awareness training must be provided to employees. • The operation must have a rehabilitation and closure plan. • Management and staff must be trained to understand the contents of these documents, and to adhere thereto. Biennial performance Assessment Reports and annual quantum Calculations must be done to ensure that the operation adheres

		to encourage (faunal dispersal) and should minimise dissection or fragmentation of any important faunal habitat type. The extent of the prospecting area should be demarcated on site layout plans (preferably on disturbed areas or those identified with low conservation importance). Appointment of a full-time ECO must render guidance to the staff and contractors with respect to suitable areas for all related disturbance, and must ensure that all contractors and workers undergo Environmental Induction prior to commencing with work on site. All those working on site must undergo environmental induction with regards to fauna and in particular awareness about not harming or collecting species such as snakes, tortoises and owls which are often persecuted out of superstition. All those working on site must be educated about the conservation importance of the fauna and flora occurring on site.		to the contents of the EIA and EMPr documents.

		The environmental induction should occur in the appropriate languages for the workers who may require translation. Reptiles and amphibians that are exposed during the clearing operations should be captured for later release or translocation by a qualified expert. Employ measures that ensure adherence to the speed limit. Careful consideration is required when planning the placement for stockpiling topsoil and the creation of access routes in order to avoid the destruction of habitats and minimise the overall prospecting footprint. The Footprint areas of the prospecting activities must be scanned for Red Listed and protected plant species prior to prospecting; Snares & traps removed and destroyed; and Maintenance of firebreaks. It will therefore be necessary to divert storm water around dump areas by construction of a berm that will prevent surface run-off into the drainage channels.		

		The re-vegetation of disturbed areas is important to prevent erosion and improve the rate of infiltration. Erosion channels that may develop before vegetation has established should be rehabilitated by filling, levelling and re-vegetation where topsoil is washed away.		
Salvage yard (Storage and laydown area)	Surface Water contamination Groundwater contamination Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance Surface water contamination	Access Control Maintenance of fence Storm water run-off control Immediately clean hydrocarbon spill	Removal of fence around salvage yard and ripping of salvage yard area upon closure of the prospecting right.	The following must be placed at the site and is applicable to all activities: • Relevant Legislation; • Acts; • Regulations • COP's • SOP's Management and staff must be trained to understand the contents of these documents and to adhere thereto. • Environmental Awareness training must be provided to employees. • The operation must have a rehabilitation and closure plan.

				• Management and staff must be trained to understand the contents of these documents, and to adhere thereto. Biennial performance Assessment Reports and annual quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMPr documents.
Stockpile area	Surface Water contamination Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance Surface water contamination		Dust Control and monitoring Noise control and monitoring Drip trays Storm water run-off control Immediately clean hydrocarbon spills Rip disturbed areas to allow re-growth of vegetation cover Noise control Well maintained equipment Selecting equipment with lower sound power levels; Develop a mechanism to record and respond to complaints.	Dust levels minimized Minimize potential for hydrocarbon spills to infiltrate into groundwater Noise levels minimized Rehabilitation standards and closure objectives to be met. Erosion potential minimized.
Waste disposal site (domestic and industrial waste):	Groundwater contamination Surface Water contamination	Storage of Waste within receptacles Storm water control Ground water monitoring Storage of hazardous waste on concrete floor with bund wall	Removal of waste receptacles, breaking and removal of rubble from the concrete floors and bund walls upon closure of prospecting right.	The following must be placed at the site and is applicable to all activities: • Relevant Legislation; • Acts;

	Contamination of soil Surface water contamination	Removal of waste on regular intervals		• Regulations • COP's • SOP's Management and staff must be trained to understand the contents of these documents and to adhere thereto. • Environmental Awareness training must be provided to employees. • The operation must have a rehabilitation and closure plan. • Management and staff must be trained to understand the contents of these documents, and to adhere thereto. Biennial performance Assessment Reports and annual quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMPr documents.
Roads (both access and haulage road on the prospecting site):	Dust Surface Water contamination	Maintenance of roads Dust control and monitoring Noise control and monitoring Speed limits Storm water run-off control Erosion control	Upon cessation of the individual activity (continuous rehabilitation) Ripping of roads upon closure of the prospecting right.	The following must be placed at the site and is applicable to all activities: • Relevant Legislation; • Acts;

	Groundwater contamination Noise Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance	Immediately clean hydrocarbon spills Rip disturbed areas to allow re-growth of vegetation cover Noise control Well maintained equipment Selecting equipment with lower sound power levels; Develop a mechanism to record and respond to complaints. Linear infrastructure such as roads and pipelines will be inspected at least monthly to check that the associated water management infrastructure is effective in controlling erosion.		• Regulations • COP's • SOP's Management and staff must be trained to understand the contents of these documents and to adhere thereto. • Environmental Awareness training must be provided to employees. • The operation must have a rehabilitation and closure plan. • Management and staff must be trained to understand the contents of these documents, and to adhere thereto. Biennial performance Assessment Reports and annual quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMPr documents.
Workshop and Wash bay	Surface Water contamination Removal and disturbance of	Concrete floor with oil/water separator Storm water run-off control Immediately clean hydrocarbon spills	Removal of wash bay equipment, breaking and removal of rubble from the concrete floors and bund walls	The following must be placed at the site and is applicable to all activities: • Relevant Legislation;

	vegetation cover and natural habitat of fauna Soil contamination		upon closure of prospecting right	• Acts; • Regulations • COP's • SOP's Management and staff must be trained to understand the contents of these documents and to adhere thereto. • Environmental Awareness training must be provided to employees. • The operation must have a rehabilitation and closure plan. • Management and staff must be trained to understand the contents of these documents, and to adhere thereto. Biennial performance Assessment Reports and annual quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMPr documents.
Water distribution Pipeline	Surface disturbance	Monitor pipeline for water leaks Maintenance of pipeline Linear infrastructure such as roads and pipelines will be	Removal of pipeline upon closure of the prospecting right.	The following must be placed at the site and is applicable to all activities:

		inspected at least monthly to check that the associated water management infrastructure is effective in controlling erosion.		• Relevant Legislation; • Acts; • Regulations • COP's • SOP's Management and staff must be trained to understand the contents of these documents and to adhere thereto. • Environmental Awareness training must be provided to employees. • The operation must have a rehabilitation and closure plan. • Management and staff must be trained to understand the contents of these documents, and to adhere thereto. Biennial performance Assessment Reports and annual quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMPr documents.
Water tanks:	Surface disturbance	Maintain water tanks and structures	Removal of water tank and steel structure upon closure of the prospecting right.	The following must be placed at the site and is applicable to all activities:

				• Relevant Legislation; • Acts; • Regulations • COP's • SOP's Management and staff must be trained to understand the contents of these documents and to adhere thereto. • Environmental Awareness training must be provided to employees. • The operation must have a rehabilitation and closure plan. • Management and staff must be trained to understand the contents of these documents, and to adhere thereto. Biennial performance Assessment Reports and annual quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMPr documents.

i) Financial Provision

(1) Determination of the amount of Financial Provision

(a) Describe the closure objectives and the extent to which they have been aligned to the baseline environment described under Regulation 22(2)(d) as described in 2.4 herein.

The key aim of decommissioning and closure is to ensure that all the significant impacts are ameliorated and that the environment is returned to its original state, based on the baseline information, as far as is practically possible. Therefore, all rehabilitated areas should be left in a stable, self-sustainable state and proof of this should be submitted at closure.

The baseline environmental information is usually determined by reviewing all applicable information available for the site and the overall region. This information is gathered through a combination of on-site observations, spatial information and specialist baseline studies. Information regarding current land uses and existing biophysical environment gathered from interested and affected parties during the public consultation process are also taken into consideration when describing the baseline environment.

General closure objectives include the following:

Adhere to all statutory and other legal requirements;

Identify potential post-closure land uses in consultation with the future landowner, surrounding land owners and land users; well in advance, before closure and preferably during the operational phase of the operation;

Remove, decommission and dispose all infrastructures, and ensure that these processed comply with all conditions contained in the MPRDA

Rehabilitate disturbed land to a state suitable for its post-closure uses, and which are stable, sustainable and aesthetically acceptable on closure;

Rehabilitate disturbed land and mine residue deposits to a state that facilitates compliance with applicable environmental quality objectives;

Physically stabilise remaining structures to minimise residual risks;

Ensure the health and safety of all stakeholders during closure and post closure and that future land users are not exposed to unacceptable risks;

To alleviate the negative socio-economic impacts that will result from closure;

Promote biodiversity and ecological sustainability as far as practically possible;

Keep relevant authorities informed of the progress of the decommissioning phase;

To ensure that all natural physical, chemical and biological processes for which a closure condition were specified are monitored until they reach a steady state, for two years after closure, or for long as deemed necessary at the time and to submit such monitoring data to the relevant authorities;

Maintain required facilities and rehabilitated land until closure.

(b) Confirm specifically that the environmental objectives in relation to closure have been consulted with landowner and interested and affected parties.

An Advert (Notice) was placed in the DFA on 28 August 2020 to notify all other interested and affected parties.

Registered consultation letters were send on 09 September 2020 to all identified parties and government departments with a BID (Background Information Document) document attached.

The Scoping Report was put on disc and was distributed to all the registered parties per registered mail on 10 September 2020.

The document will also be made available at the public library in Barkly West, if possible, otherwise the document will be put in the Kimberley library.

The document can also be viewed at the EAP address with prior arrangement to view the document.

The EIA EMP document was put on disc and was distributed to all the registered parties per registered mail on 4 August 2021.

Consultation process:

Proof of consultation (attendance registers, minutes of meetings and response forms) is attached as Appendix '3'. The consultation process is ongoing

(c) Provide a rehabilitation plan that describes and shows the scale and aerial extent of the main mining activities, including the anticipated mining area at the time of closure.

The rehabilitation of land disturbed by the operation during the life of the Prospecting Right will be accompanied by ongoing monitoring of the environment, until a stable state is reached. The main objectives are to have an uncontaminated, rehabilitated and safe environment, and to restore the area and habitats to a condition acceptable for obtaining a closure certificate.

Final rehabilitation of the site is expected to be within 5 years after the right has been granted. Final rehabilitation will be executed systematically and will consist of the elements and procedures as listed below. More realistic closure elements will be fully determined by a Professional Mine Surveyor once the operation is active.

Dismantling of processing plant and related structures:

- The processing plant in total is expected to cover an area of 900 m2, of which all should be dismantled and removed. This includes related infrastructures, equipment, machinery, screening plant, and other items used during the processing activities, such as conveyor belts, pipelines and power lines.
- The topography should then be restored to its natural contours, and any compacted area should be ripped to a depth no deeper than 300 mm;
- The prepared surfaces should then be covered with 300 mm of topsoil or suitable growth medium, which includes a viable seed bank; in order to encourage restoration of natural vegetation.

Demolition of steel buildings and structures:

- All steel buildings and structures are expected to amount to 500 **m2**. These include mobile stores, workshops, offices, ablutions, water tanks, etc. Those in disuse and which cannot be sold, donated, or used for future purposes should be dismantled and removed or demolished.
- Any associated foundations associated with dismantled steel buildings and structures should also be demolished to 1 m below ground level;

- The topography should then be restored to its natural contours, and any compacted area should be ripped to a depth no deeper than 300 mm;
- The prepared surfaces should then be covered with 300 mm of topsoil or suitable growth medium, which includes a viable seed bank; in order to encourage restoration of natural vegetation.

Demolition of reinforced concrete buildings and structures

- All brick buildings and concrete structures are expected to amount to 480 **m2**. These include French drains, wash bays, refuelling depots and concrete floors. Those in disuse and which cannot be donated or used for future purposes should be demolished.
- The foundations of these buildings should also be demolished and to a depth of 1 m below ground level;
- The topography should then be restored to its natural contours, and any compacted area should be ripped to a depth no deeper than 300 mm;

- The prepared surfaces should then be covered with 300 mm of topsoil or suitable growth medium, which includes a viable seed bank; in order to encourage restoration of natural vegetation.

Rehabilitation of access roads

- Mine roads in total, is expected to cover an area of 5000 m2. After general site rehabilitation has been completed, all redundant roads should be ripped or ploughed.
- The prepared surfaces should then be covered with 300 mm of topsoil or suitable growth medium, which includes a viable seed bank; in order to encourage restoration of natural vegetation.

Demolition and rehabilitation of electrified railway lines

- There are no electrified railway lines associated with the Prospecting activities.

Demolition and rehabilitation of non-electrified railway lines

- There are no non-electrified railway lines associated with the Prospecting activities.

Demolition of housing and/or administration facilities

- There are no other housing or administration facilities associated with the Prospecting activities, other than those in the form of mobile containers. These were however included in the section for demolition of steel buildings and structures.

Opencast rehabilitation including final voids and ramps

- Opencasts and ramps associated with the Prospecting activities are expected to cover 4ha at any one time.
- In-filling of the pits should take place concurrently and by obtaining material from the closest adjacent excess material heaps;
- The topography should then be shaped to the natural contours;
- The prepared surfaces should finally be covered with 300 mm of topsoil or suitable growth medium, which includes a viable seed bank; in order to encourage restoration of natural vegetation.

Sealing of shafts, adits and inclines

- There are no shafts associated with the Prospecting activities.

Rehabilitation of overburden and spoils

- The total final overburden and spoils are estimated to amount to 0.25 ha and includes waste dumps as well as earth walls. Pre-planning should be conducted in order decide the fate of these features. For example, if the material from these features will be used for in-filling, or if the features will remain after closure.
- The slopes of those features selected to remain after closure, should be downgraded to such an extent that they are not visually intrusive to the skyline after closure, and/or at least have an average outer slope of 1:3 (18°); or as predetermined by a specialist, depending on the type of material;
- The prepared surfaces should then be covered with 300 mm of topsoil or suitable growth medium, which includes a viable seed bank; in order to encourage restoration of natural vegetation, to ensure stability, improve the visual impact, and minimise erosion.

Rehabilitation of processing waste deposits and evaporation ponds with pollution potential

- No processing waste deposits and evaporation ponds with pollution potential are associated with the Prospecting activities.

Rehabilitation of processing waste deposits and evaporation ponds with no pollution potential

- The processing waste deposits on the Prospecting area is estimated to cover an area of ± 0.25 ha. Pre-planning should be conducted in order decide the fate of this feature. For example, if the material from these features will be used for in-filling, or if the features will remain after closure.
- The toe trenches should be backfilled by obtaining material from the closest adjacent heaps deemed appropriate for such purpose;

The slopes of those features selected to remain after closure, should be downgraded to such an extent that they are not visually intrusive to the skyline after closure, and/or at least have an average outer slope of 1:3 (18°); or as predetermined by a specialist, depending on the type of material;

- For backfilled trenches the topography should be shaped to be in line with the natural contours, but where compaction occurred, the areas should be ripped to a depth no deeper than 300 mm;
- The prepared surfaces should then be covered with 300 mm of topsoil or suitable growth medium, which includes a viable seed bank; in order to encourage restoration of natural vegetation, to ensure stability, improve the visual impact, and minimise erosion.

Storm water management

Storm water runoff arising from the upper and outer slopes of the rehabilitated residue deposit should be managed to:

(1) prevent uncontrolled runoff from the residue deposit, which in turn creates surface erosion and resultant damage to the cover material and could also expose deposited material;

(2) route the runoff arising from the rehabilitated residue deposit into the surrounding surface water drainage regime in a manner that would limit the creation of secondary erosion in the receiving surface water environment and/or possible damage to downstream surface infrastructure; and

(3) allow for the control routing of the runoff collected on the rehabilitated residue deposit across cut-off, seepage or solution trenches provided to handle excess contaminated seepage from the residue deposit.

Rehabilitation of subsided areas

The EAP is not currently aware of any areas of subsidence on site. However, any potential for such occurrences should be actively investigated and should be included in the rehabilitation plan, if and when such areas are identified.

General surface rehabilitation

- Final surface rehabilitation of areas disturbed by prospecting and related activities should be aligned to the selected final land use. General surface rehabilitation encompasses the reinstatement of natural topography, the top soiling and the re-vegetation of all those areas where infrastructure have been dismantled and removed or demolished. It also includes any industrial waste or scrap material that need to be removed from site. The total area that will need general surface rehabilitation at the time mine closure is estimated to be ± 0 ha.

River diversions
No river diversions are planned.

Fencing
It is not known at this stage if any fencing is planned.

Water management
No treatment of water will be necessary for the Prospecting activities.

Maintenance and aftercare
Maintenance and aftercare should be planned for two to three years after prospecting production have ceased and should include the following:

- Annual fertilising of rehabilitated areas.
- Monitoring of surface and subsurface water quality,
- Control of alien plants, and
- General maintenance, including rehabilitation of cracks and subsidence.
- Erosion control and monitoring of the slopes of the slimes dams;

Specialist study

- A screening level risk assessment should be completed by a specialist environmental practitioner during mine closure in order to ensure that all of the rehabilitation objectives have been met and that all of the potential risks have been eliminated and/or are controlled. This assessment should specifically emphasis on those risks relating to river disturbances, groundwater quality and slope stabilities, but should not neglect progress made in natural vegetation restoration or success in alien invasive eradications. The current average specialist fees are estimated at R 50 000.

(d) Explain why it can be confirmed that the rehabilitation plan is compatible with the closure objectives.

The rehabilitation plan was primarily designed with the closure objectives in mind and therefore it relates to all the various objectives as set out above in Section 1) g) 1) a) of this EMPR. In general, the main objectives are to have an uncontaminated, rehabilitated and safe environment, and to restore the prospecting area to a condition acceptable for obtaining a closure certificate. Each and every element in

the rehabilitation plan was designed in order to meet these closure objectives.

(e) Calculate and state the quantum of the financial provision required to manage and rehabilitate the environment in accordance with the applicable guideline.

The current, preliminary mine closure and rehabilitation costs amounts to R 239 421 (Please see table 14 below for calculation).

(f) Confirm that the financial provision will be provided as determined.

It is hereby confirmed that the financial provision will be provided as determined.

Table 14: Financial Quantum

No.	Description	Unit	A	B	C	D	E=A*B*C*D
			Quantity	Master Rate	Multiplication factor	Weighting factor 1	Amount (Rands)
Remark:							
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m3	900	15,68	1	1	14112
					1	1	
2 (A)	Demolition of steel buildings and structures	m2	0	218,41	1	1	0
2(B)	Demolition of reinforced concrete buildings and structures	m2	0	321,86	1	1	0
3	Rehabilitation of access roads	m2	5 000	2,29	1	1	11450
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	379,34	1	1	0
4 (A)	Demolition and rehabilitation of non-electrified railway lines	m	0	206,91	1	1	0
5	Demolition of housing and/or administration facilities	m2	0	436,81	1	1	0
6	Opencast rehabilitation including final voids and ramps	ha	4	222313,32	0,04	1	35570,1312
7	Sealing of shafts adits and inclines	m3	0	117,25	1	1	0
8 (A)	Rehabilitation of overburden and spoils	ha	0,25	152653,61	1	1	38163,4025
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0,25	190127,32	1	1	47531,83
					1	1	
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0	552219,84	1	1	0
					1	1	
9	Rehabilitation of subsided areas	ha	0	127824,41	1	1	0
10	General surface rehabilitation	ha		120927,41	1	1	0
11	River diversions	ha	0	120927,41	1	1	0
12	Fencing	m	0	137,94	1	1	0
13	Water management	ha	0	45980,00	1	0,6	0
14	2 to 3 years of maintenance and aftercare	ha	2	16093,00	1	1	32186
15 (A)	Specialist study	Sum	0			1	0
15 (B)	Specialist study	Sum	0			1	0
					Sub Total 1		179013,3637
1	Preliminary and General		10740,80182		**weighting factor 2** 1,05		11277,84191
2	Contingencies				17901,33637		17901,33637
					Subtotal 2		208192,54
					VAT (15%)		31228,88
					Grand Total		**239421**

Mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon, including

g) Monitoring of Impact Management Actions

h) Monitoring and Reporting Frequency

i) Responsible persons

j) Time Period for Implementing Impact Management Actions

k) Mechanisms for Monitoring Compliance

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Topography	To minimise the reduction of land capability.	To ensure that rehabilitation post-prospecting slopes are stable, free draining and no slopes have an angle in excess of 20º.	Site Manager/ Environmentalists	Monitoring will be done on an *annual basis* to ensure that the levels and the slopes are in order.
Soil	To prevent soil pollution; To limit soil compaction; To curb soil erosion; and To reinstate a growth medium able to sustain plant life.	Soil depth and chemical composition will be tested and possible erosion damage will be assisted and rectified.	Site Manager/ Environmentalists	Monitoring will be done on an *annual basis* or after a heavy rain event.
Air Quality	To control the incidence of unacceptable levels of dust pollution on site.	To ensure that the mine minimizes dust omissions, so that dust does not become a nuisance for affected parties and a health hazard.	Site Manager/Foreman appointed SHE Consultant	Visual inspections will be done and managed by dust suppression by a water tanker. Quarterly tests will also be conducted by a Safety Health and Environmental Consultant and submitted to Mine Health and Safety for monitoring purposes.
Fauna	To minimise vegetation destruction in prospecting areas, and therefore a habitat for wildlife; and To eliminate poaching and the extermination of animal species within the boundaries of the study area as well as the surrounding areas.	To ensure that the species diversity and abundance is not significantly reduces.	Site Manager/ Environmentalists	Monitoring will be done at rehabilitated area on an *annually basis* to investigate species diversity and abundance.
Flora	To minimise the destruction of vegetation units; and To control invasion of exotic and invasive plant species.	To ensure that the rehabilitated areas become self-maintaining.	Site Manager/ Environmentalists	Monitoring will be done at the rehabilitated areas on a *twice a year basis* (mid-summer and mid-winter), where species diversity and vegetation cover will be investigated.
Noise and Vibration	To ensure that the legislated noise and ground vibration levels will be adhered to at all times.	The management objective will be to reduce any level of noise, shock and lighting that may have an effect on persons or animals, both inside the plant	The engineer during the construction phase and the responsible person	Quarterly reports on fall-out noise monitoring will be conducted as required by legislation.

	To control the incidence of unacceptable noise levels on site.	and that which may migrate outside the plant area.	(Engineering/ Environmental Department) during the Operational phase of the project. The site engineer and independent qualified environmental noise and vibration specialist.	If any complaints are received from the public or state department regarding noise levels the levels will be monitored at prescribed monitoring points.
Surface Water	To conserve water; and To eliminate the contamination of run-off.	The Vaal River borders the prospecting right application area.	Site Manager/Water Supply	The Vaal River is perennial. Monitoring takes place by collecting surface water samples quarterly out of the Vaal River.

l) Indicate the frequency of the submission of the performance assessment report

Auditing of compliance with environmental authorisation, the environmental management programme and the closure plan should be conducted biennially by an independent EAP and an Environmental Audit Report should be compiled in such a way that it meets the requirements in terms of Regulation 34 of the National Environmental Management Act 107 of 1998): Environmental Impact Assessment Regulation, 2014.
The rehabilitation plan should also be reviewed biennially in order to fulfil the requirements of Section 41(3) of the MPRDA and should be conducted by an independent EAP. Subsequently, an Annual Rehabilitation Plan should be developed to meet the various requirements set out in the National Environmental Management Act (No 107 of 1998) (NEMA) Regulations pertaining to the financial provision for prospecting, exploration, mining or production operations (as amended in 2015).
These reports should be submitted biennially to the Northern Cape DMR offices in Kimberley.

m) Environmental Awareness Plan

The objective of the environmental awareness plan is to ensure that:

- Training needs are identified and all personnel whose work may create a significant impact upon the environment have received appropriate training;
- All employees are aware of the impact of their activities
- Procedures are established and maintained to make appropriate employees aware of:
    - The significant environmental impacts (actual or potential) of their work activities and environmental benefits of improved personal performance,
    - Their roles and responsibilities in achieving conformance with environmental policies, procedures, and any implementation measures,
    - The potential consequences of departure from specified operating procedures.
- Personnel performing tasks, which can cause significant environmental impacts, are competent in terms of appropriate education, training and / or experience.

Environmental awareness will be part of the existing training and development plan. Key personnel with environmental responsibilities will be identified and the following principles will apply:

- Procedures will be developed to facilitate training of employees, on-site service providers and contractors;
- Environmental awareness will focus on means to enhance the ability of personnel and ensure compliance with the environmental requirements;

Top management will build awareness and motivate and reward employees for achieve environmental objectives;

- Environmental policies will be availed to prospecting employees and contractors;
- Environmental inductions will be conducted for employees, contractors and visitors;
- There will be an ongoing system of identifying training needs.

General environmental awareness training as part of the induction at the Bokamoso operations should focus on the following:

- General environmental awareness
- The mine policies and vision concerning environmental management
- Legal requirements
- Prospecting activities and their potential impacts
- Different management measures to manage identified impacts
- Mine personnel's role in implementing environmental management objectives and targets.

(1) Manner in which the applicant intends to inform his or her employees of any environmental risk which may result from their work.

It is the responsibility of management to ensure that all employees, contractors and visitors are trained to understand the impacts of their tasks on the environment and to reduce them wherever possible. Environmental awareness should be part of the existing training and development plan. Key personnel with environmental responsibilities should be identified and the following principles should be applied:

- Procedures should be developed to facilitate training of employees, on-site service providers and contractors;
- Environmental awareness should focus on means to enhance the ability of personnel and ensure compliance with the environmental requirements;
- Top management should build awareness and motivate and reward employees for achieving environmental objectives;
- There should be an ongoing system of identifying training needs.
- An environmental, health and safety induction programme should be provided to all employees, contractors and visitors prior to commencing work or entering the site, and they should sign acknowledgement of the induction. An attendance register and agenda/programme should be filed for each induction.
- A daily "toolbox talk" should be held prior to commencing work, which will include discussions on health, safety and environmental considerations. The toolbox talks should be led by the site manager or the appointed supervisor/s.
- Refresher training should also be given to permanent employees and long-term contractors on an annual basis, to ensure that all are competent to perform their

duties, thereby eliminating negative impacts on their safety, health and environment.

General environmental awareness training as part of the induction at Bokamoso should focus on the following:

- General environmental awareness, which incorporates environmental, ecological and heritage elements;
- The mine policies and vision concerning environmental management;
- Legal requirements;
- Mine activities and their potential impacts;
- Different management measures to manage identified impacts;
- Mine personnel's role in implementing environmental management objectives and targets.

Environmental awareness topics to be covered in training should include:

- Natural resource management and conservation;
- Biodiversity awareness and conservation principles;
- Heritage resource awareness and preservation principles;
- Hazardous substance use and storage;
- Waste management; and
- Incident and emergency actions and reporting;

(2) Manner in which risks will be dealt with in order to avoid pollution or the degradation of the environment.

Environmental incident reporting will be a vital part of communication in order to deal with risks and ultimately avoid pollution or the degradation of the environment. Such communication should take place through the management, administrative and worker sectors of the operation, as well as contractors and visitors. Employees should be required to report any and all environmentally related problems, incidents and pollution, so that the appropriate mitigation actions can be implemented timeously. In the event of an environmental incident, the reporting procedure as indicated in the table below should be followed.

ENVIRONMENTAL INCIDENT REPORTING STRUCTURE	ACTIONS REQUIRED
Person causing or observing the incident	The first person causing or observing the incident shall report the incident to an immediate supervisor where the environmental incident is observed.
Line management in the relevant area of responsibility where the incident occurred	Line management in the relevant area of responsibility where the incident occurred shall: • Investigate the incident and record the following information: - How the incident happened; - The reasons the incident happened; - How rehabilitation or clean up needs to take place; - The nature of the impact that occurred; - The type of work, process or equipment involved; - Recommendations to avoid future such incidents and/or occurrences; • Inform the environmental manager/ECO and the Operations Manager on a daily basis of all incidents that were reported on site; • Consult with the relevant department/person for recommendations on actions to be taken or implemented where appropriate (e.g. clean-ups). • Assist the Environmental Manager and/or Operations Manager with applicable data in order to accurately capture the incident into the reporting database; • Ensure that remediation measures are implemented as soon as possible.

Site managers	The site managers shall: • Forward a copy of the incident form to other line managers; • Forward a copy of the incident form to the Environmental manager/ECO; • Inform the relevant department/person on a weekly basis of the incident by e-mail or by submitting a copy of the incident report. Once a High Risk Incident (any incident which results from a significant aspect and has the potential to cause a significant impact on the environment) occurred it must be reported immediately to the Environmental Manager and the Operations Manager by telephone or email to ensure immediate response/action. • Forward a copy of the completed Incident Reporting Form (and where applicable a copy of the incident investigation) to the relevant department/person.
Environmental manager/ECO	The appointed environmental manager or ECO shall: • Complete an incident assessment form to assess what level of incident occurred; • Make recommendations for clean-up and/or appropriate alternate actions; • Enter actions necessary to remediate environmental impacts into the database in conjunction with the responsible line manager; • Enter the incident onto the database in order to monitor the root causes of incidents; • Include the reported incidents in an appropriate monthly/quarterly report; • Highlight all incidents for discussion at HSEC meetings.

n) Specific information required by the Competent Authority

(Among others, confirm that the financial provision will be reviewed annually)

According to Section 41(3) of the MPRDA the holder of a prospecting right must annually assess (and revise, if necessary) the total quantum of environmental liability for the operation and ensure that financial provision are sufficient to cover the current liability (in the event of premature closure) as well as the end-of-operation liability.

An Annual Rehabilitation Plan should be developed to match the various requirements set out in the NEMA regulations pertaining to the financial provision for prospecting, exploration, mining or production operations (as amended in 2015).

An environmental audit report will be done biennially (every second year).

Officials in the DMR Regional Offices are required to assess, review and approve the quantum of financial provision submitted (that is, the monetary value of the financial provision that has been computed by the holder of a prospecting right, mining right or mining permit during the annual review) as being sufficient to cover the environmental liability at that time and for closure of the site at that time.

It is hereby confirmed that the financial provision shall be reviewed annually.

2) UNDERTAKING

The EAP herewith confirms

a) the correctness of the information provided in the reports;

b) the inclusion of comments and inputs from stakeholders and I&APs;

c) the inclusion of inputs and recommendations from the specialist reports where relevant; and

d) the acceptability of the project in relation to the finding of the assessment and level of mitigation proposed.

_____

Signature of the Environmental Assessment Practitioner:

Wadala Mining and Consulting Pty Ltd

_____

Name of Company:

Date: 03 August 2021

- END –

APPENDIX 1

DIE UNIVERSITEIT VAN DIE ORANJE-VRYSTAAT

THE UNIVERSITY OF THE ORANGE FREE STATE

HIERMEE WORD VERKLAAR DAT DIE GRAAD THIS IS TO CERTIFY THAT THE DEGREE

Magister in Omgewingsbestuur

Master in Environmental Management

TOEGEKEN IS AAN
HAS BEEN CONFERRED UPON

ROELINA HENRIËTTE OOSTHUIZEN

NADAT AAN DIE STATUTE EN REGULASIES VAN DIE UNIVERSITEIT VOLDOEN IS. AS BEWYS DAARVAN PLAAS ONS ONS ONDERSKEIE HANDTEKENINGE EN DIE SEël VAN DIE UNIVERSITEIT HIERONDER.

IN ACCORDANCE WITH THE STATUTES AND REGULATIONS OF THE UNIVERSITY. AS WITNESS OUR RESPECTIVE SIGNATURES AND THE SEAL OF THE UNIVERSITY BELOW.

VISEKANSELIER/VICE-CHANCELLOR

DEKAAN/DEAN

REGISTRATEUR/REGISTRAR

BLOEMFONTEIN
2000-09-16

APPENDIX 2

CURRICULUM VITAE

Roelina Henriette Oosthuizen

Cell: 084 208 9088

E-Mail: roosthuizen950@gmail.com

1. PERSONAL INFORMATION

Name: Roelina Henriette Oosthuizen

Surname: Oosthuizen (Maiden: Alberts)

Identity number: 7004180037082

Date of birth: 18 April 1970

Gender: Female

Marital status: Married (28 years) with 3 children

Driving license: Yes, Code EB

Languages: Fluent in Afrikaans and English

Nationality: South African

Criminal offences: None

Health: Excellent, fit

2. SYNOPSIS OF PROFESSIONAL CAREER

Roelina Henriette Oosthuizen has 22 years of experience in the environmental management field. She started her career in the area of Environmental Management and Environmental Impact Assessment (EIA) evaluation in 1997 at the Department of Minerals and Energy. After moving to industry in 2005, Roelien became involved in the practical aspects of environmental management. A major project during her early years outside of government was that of the EIA for a Game Reserve and Lodge development near Barkly-Wes, she did this project together with a consultancy firm from Kimberley AWS water solutions (Mr. Adriaan du Toit). In 2007 the Company she worked for was bought by a Canadian Group of Companies and she became more involved in practical aspects of the operations and worked closely with operations personnel in dealing with ongoing management of environmental impacts at the Mine (e.g. monitoring, auditing, operating procedures). She was also centrally involved in liaison with the authorities and with stakeholders in neighbouring areas.

During her time at the Canadian Group of Companies, Roelien was the environmental manager overseeing operations in the Barkly-West, Prieska and Douglas areas. She was responsible for preparing the environmental compliance documents for each operation which included Performance Assessments (Audit reports) and Financial Quantum submissions as well as new applications for Prospecting Rights and Mining Rights with the relevant Scoping, EIA / EMP documents. Her activities included liaison with stakeholders and also with the relevant Departments. During this time, Roelien became increasingly involved in environmental policy and strategy work, as well as the environmental aspects of corporate governance.

She has assisted a range of clients with Environmental Due Diligence audits and compliance audits. Roelien has also undertaken numerous environmental audits, particularly compliance and due diligence audits for clients in the mining industry. Thus, she is familiar with best practice standards in environmental auditing.

Roelien have also represented the South African Diamond Producers Organisation (SADPO) on the Environmental Policy Committee (EPC) at the Chamber of Mines between 2005 and 2011.

In a nutshell, Roelien has wide ranging experience and is thus well-positioned to assist clients in any matter related to sustainability and environmental management. This is achieved through her own skills base and on drawing on specialists.

3. QUALIFICATIONS

MEM (Master in Environmental Management) University of the Orange Free State (2000)
B – Comm NWU (1991)

4. TRAINING COURSES

Roelien have attended various mining and environmental conferences and seminars to stay abreast with the latest changes in legislation, legal compliance and policy positions in the sector.

October 1997	Mineral Laws Administration & Environmental Management (University of Pretoria)
July 2002	Project Management for Environmental Systems (University of the Orange Free State)
August 2004	Environmental and Sustainability in Mining Minerals and Energy Education and Training Institute (MEETI)
September 2005	Converting Old Order Rights to New Order Rights in Mining International Quality & Productivity Centre Johannesburg)
November 2006	Mine waste disposal and Achievement of Mine Closure
February 2007	Introduction to ArcGis 1
April 2010	Mining Law Update Conference (IIR BV South Africa)
November 2010	Social Labour Plans for Mining Workshop (Melrose Training)
August 2011	Mineral Resources Compliance and Reporting (ITC)
May 2012	Enviro Mining Conference 2012 (Sustainability and Rehabilitation) (Spectacular Training Conferences)
August 2012	Mineral Resources Compliance and Reporting 4th Annual (ITC)
March 2013	1st EnviroMining-Ensuring Environmental Compliance and reporting
March 2014	4th Annual EnviroMining Conference
March 2015	5th Annual EnviroMining Conference
February 2018	Seminar by the Department of Environmental Affairs on knowledge sharing workshops on the Screening Tool
October 2020	Symposium IAIAsa

5. PROFESSIONAL REGISTRATION

Registered Environmental Assessment Practitioner 2019/1467 at EAPASA.
Registered as a professional at IAIAsa (International Association for Impact Assessment South Africa). IAIAsa is a voluntary organisation and is not a statutory body regulating the profession. Its members are however expected to abide by the organisations code of ethics.

6. PROFESSIONAL EXPERIENCE

Projects are listed below by area of expertise.

Environmental Management Systems (EMS) and Environmental Auditing

Development of EMS and Compilation of INCIDENT REPORT AND INVESTIGATION FORMS for the EMS of the Canadian group of Companies on various sites.

Undertaking of a range of due diligence and performance audits for operations, including those listed below:

Performance Assessment reports for a mining company with various infrastructure and mining operations near Barkly-West and Windsorton.

Performance Assessment reports for a mining company near Douglas.

Preparation of an environmental auditing checklist / protocol for a Community project with restitution ground in assisting the community to determine environmental legal compliance at their operations.

Environmental audit as part of a closure with Dr. Betsie Milne another specialist. This Annual Rehabilitation Plan has been developed to match the various requirements set out in the National Environmental Management Act (No 107 of 1998) (NEMA) Regulations pertaining to the financial provision for prospecting, exploration, mining or production operations (as amended in 2015).This project had the objective of ensuring that this company are accounting for environmental liabilities and risks adequately. The plan distinguishes between (a) those environmental rehabilitation liabilities pertaining to drilling, for which the Company was legally responsible and (b) those environmental rehabilitation liabilities pertaining to historic mining activities, for which the Company is not legally responsible, but consider performing as part of their best practice environmental principals. Three costing scenarios were explored in order to evaluate the most feasible rehabilitation plan, i.e. (1) Total cost (worst-case scenario) including risks, (2) legally required cost and (3) features currently available that do not involve any risks.

Sustainability projects: policies, guidelines, strategies and performance reporting

Involved in the compilation of 43-101 technical documents for listed companies which included information on sustainability and performance in rehabilitation and sustainable mining.

Alien species eradication project guideline and strategy near Barkly-Wes in terms of Regulations that have been promulgated in terms of the Conservation of Agricultural Resources Act, No. 43 of 1983 further make it unlawful to allow various species of weeds and invader plants to grow. The target species was Wild tobacco (declared weed), Pink Tamarisk (declared weed) and Mexican poppy, it also involved the community for job creation and training (2008).

Investigations for a Company near Prieska on Development of a biodiversity offsets policy for the applications for forestry tree licences for protected tree species.

Strategic Environmental Studies and Environmental Impact Assessment (EIA)

Undertaking of a Application for authorisation in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2006 for a Private Individual which involved the proposed extension of a roof over an existing deck with two wood pillars by means of the excavating of 0.5m X 0.5m X 1m X 2 (½m²) OF SOIL WITHIN 100M OF THE HIGH WATER MARK OF THE SEA. A Positive Record of Decision (ROD) Granted (2010).

Undertaking of an ENVIRONMENTAL IMPACT ASSESSMENT & ENVIRONMENTAL MANAGEMENT PROGRAMME SUBMITTED FOR AN APPLICATION FOR A MINING RIGHT IN TERMS OF SECTION 39 & OF REGULATION 50 & 51 OF THE MPRDA, 2002 (ACT NO. 28 OF 2002) near Boshof for a kimberlite Diamond Mining Company (2015)

Undertaking of a strategic environmental review and amendment for a Chinese group of Companies near Postmasburg. The study provided baseline environmental information and a high-level review of the potential impacts of various components of the development (2014 – 2016). Roelien worked as a member (EAP) of a large team consisting of a project Coordinator, attorneys, water specialists, other specialist and an engineer.

Environmental Impact Assessments for various developments including the proposed mining project for the former retrenchees of De Beers in Kimberley. This project involved coordination of the process, liaison with the authorities and compilation as well as appointment of specialist with contributions of specialist reports to compile the EIA EMP report (2017). Roelien worked as a member (EAP) of a team consisting of De Beers (attorneys and environmentalists), the retrenchees, the appointed contractor, EKAPA, and specialist appointed for the studies.

Environmental Impact Assessments for a Salt operation near Upington. This project involved coordination of the process, liaison with the authorities and compilation as well as appointment of specialists with contributions of specialist reports to compile the EIA EMP report (2019). Roelien also worked as part of a team with the Company and another consultant that started with the Water Use Licence application. The public participation was done to include the water use activities.

Environmental Impact Assessment for a change in scope of a prospecting right application consisting of the sole and exclusive right to prospect for iron, silver, zinc, copper and sulphur ore. This project involved coordination of the process, liaison with the authorities and compilation as well as appointment of specialists with contributions of specialist reports to compile the EIA EMP report (2019). Roelien also worked as a member (EAP) of a team consisting of the directors of the company and specialists appointed for the studies

7. CAREER PATH

01 April 1997 to 28 February 2005
DEPT OF MINERALS & ENERGY
Senior Environmentalist - Assistant Director Environment

MAIN JOB FUNCTIONS

- Collect analyse and interpret information regarding the measurement of impacts of mining operations on the environment, the rehabilitation of land surfaces.
- The prevention, control and combating of pollution.
- Co-ordinate and prioritise the rehabilitation of derelict and ownerless mines.
- Co-ordinate, investigate, audit and resolve environmental problems in conjunction with the Department of Water Affairs and Forestry, Department of Agriculture and the provincial Department of Tourism, Environment and Conservation.
- Address complaints and inquiries received from the public and mining industry.
- Consult with relevant authorities and interested and affected people regarding the approval of Environmental Management Programmes.
- Ensuring that rehabilitation standards are applied.
- Ensuring that the requirements stated in Environmental Management Programme Reports are adhered to.
- Conduct inspections and recommendations on mines that apply for closure.
- Evaluate mining licences and prospecting applications and recommend site-specific conditions according to legislative requirements.
- Constant liaison with the public, the mining industry and other government authorities on environmental matters, legislation and agreements.
- Influence new development processes through participation in the EMPR and EIA processes and give guidance through education and awareness programmes.
- Calculate and verify financial provision for outstanding rehabilitation.

01 March 2005 – 30 September 2012
Appointed as professional Mineral Law Administration and Environmental Manager for HC van Wyk Diamonds which was bought over in 2007 by a **Canadian group of Companies.**

MAIN JOB FUNCTIONS

Conducting of Environmental Impact Assessments (EIAs), including the implementation of public participation programmes, for a variety of projects.
Undertaking of environmental reviews, audits and management plans:
Formulation of an environmental policy and guidelines for the Group.
Participation in the development of the budget for environmental expenditure.
Co-ordination of technical studies (e.g. monitoring of groundwater quality).
Environmental compliance measurement and reporting with respect to environmental permit conditions (e.g. Forestry Licences and water sampling for Water Use Licences).
Development of environmental guidelines for contractors on sites.
Liaison with regulatory authorities on compliance with environmental legislation.
Documentation of environmental incidents.
Environmental awareness and training.

Development of a public participation strategy.
Formulation of a complaint's procedure.

01 October 2012 to Present
Appointed as professional Mineral Law Administration and Environmental Manager for **Mentor Trade and Investments Pty Ltd**

MAIN JOB FUNCTIONS

Conducting of Environmental Impact Assessments (EIAs), including the implementation of public participation programmes, for a variety of projects.
Undertaking of environmental reviews, audits and management plans.
Formulation of an environmental policy and guidelines for the Mine.
Co-ordination of technical studies (e.g. monitoring of groundwater quality) as well as updating of the Mine's IWWMP.
Environmental compliance measurement and reporting with respect to environmental permit conditions (e.g. as water sampling and effluent).
Development of environmental guidelines for contractors.
Liaison with regulatory authorities on compliance with environmental legislation.
Documentation of environmental incidents.
Environmental awareness and training.
Development of a public participation strategy.
Formulation of a complaint's procedure.

01 October 2012 to Present part time
Appointed as EAP on some projects for ***Wadala Mining and Consulting Pty Ltd***

Conducting of Environmental Impact Assessments (EIAs), including the implementation of public participation programmes, for a variety of projects.
Undertaking of environmental reviews, audits and management plans.
Liaison with regulatory authorities on compliance with environmental legislation.
Environmental awareness and training.

APPENDIX 3 PUBLIC PARTICIPATION